29th Scientific Conference

Theme

"Improving Lives Through Public Health Nutrition"

Programme & Abstracts

3-4 June 2014
Renaissance Hotel, Kuala Lumpur

Nutrition Society of Malaysia

IMPROVING LIVES *through* NUTRITION

As a professional organisation, we are guided by a simple belief – the more people understand food and nutrition, the better they can care for their health and well-being.

For that reason, we support the advancement of research, sharing practical insights and important discoveries for the benefits for all.

We also support the Government's efforts in promoting healthy nutrition in the society to combat nutrient deficiencies as well as diet-related chronic diseases in the country (e.g. obesity, diabetes, hypertension and coronary heart disease).

In caring for the community, we continuously disseminate practical nutrition information to the young and old alike, guiding them to discover the benefits of good nutrition and a healthy lifestyle.

We are committed to improve lives through nutrition. It's our way of serving Malaysians.

For more information, visit our website:
www.nutriweb.org.my

Our Activities

- Annual scientific conferences
- Scientific update sessions
- Malaysian Journal of Nutrition
- Berita NSM
- Consultation with health, regulatory & scientific bodies
- Roadshows & exhibitions with nutrition screening & dietary advice for the public
- Public talks & workshops
- A comprehensive and authoritative website on nutrition for Malaysians – http://www.nutriweb.org.my
- Nutrition promotion programmes in collaboration with other professional bodies and private sector (eg Nutrition Month Malaysia, Healthy Kids Programme, Positive Parenting)
- Conduct research on specific community groups

Our Major Publications

- Malaysian Journal of Nutrition
- Nutritionists' Choice Cookbook (Vol 1: Healthy Recipes for Your Little Ones, Vol 2: Resipi Untuk Seisi Keluarga)
- Resipi Sihat, Pilihan Bijak (Vol 1 & 2)
- Women@Heart *Wanita & Pemakanan* manual for professionals and leaflets for public
- Malaysian Dietary Guidelines leaflets
- NMM booklets on healthy eating and active living

Nutritionists' Choice Cookbook (Vol 1 & 2), Resipi Sihat, Pilihan Bijak (Vol 1 & 2)

Women@Heart *Wanita & Pemakanan* manual for professionals and leaflets for public

Healthy Eating During Pregnancy & Lactation

Wonders of Whole Grains

Malaysian Dietary Guidelines leaflets

Baby's First Bites

Breastfeed With Confidence

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Conference Secretariat

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President's Welcome Message

Welcome to the 29th Scientific Conference of the Nutrition Society of Malaysia!

The NSM is pleased to be able to continue organising this annual scientific event that I am sure all nutritionists look forward to. One of the NSM's goals is to promote nutrition science, and organising this annual conference is one of the ways towards achieving that goal. It is heartening to note that the conference continues to draw a great deal of interest amongst the nutrition fraternity in the country.

We warmly welcome YB Dato' Seri Dr Hilmi bin Haji Yahya, the Deputy Minister of Health. We thank him for graciously consenting to declare open this Conference. The presence of YB Dato' Seri is certainly meaningful to the NSM and the conference.

The 29th Scientific Conference of the Nutrition Society of Malaysia (NSM) 2014 is dedicated to discussing all aspects of the role of nutrition in public health issues. With the theme: Improving Lives Through Public Health Nutrition, it will provide a platform for all involved in the various fields of PHN to share their experiences and expertise in improving community health. This annual nutrition meeting, largest of its kind in the country shall feature symposia sessions and poster presentations by all stakeholders in PHN.

A unique feature of this year's conference is that it will be held in conjunction with the inaugural meeting of the Southeast Asia Public Health Nutrition (SEA-PHN) Network on 2 June. This historical development will signal the establishment of a collaboration of nutrition societies in SEA in public health nutrition matters. Representatives from 5 nutrition societies attending the Network meeting will be presenting on the main nutrition issues and intervention programmes in their respective countries in one symposium.

The scientific programme is packed with 25 oral presentations from a mixture of speakers from the academia, government agencies, as well as the private sector. There are a few dedicated sessions focused on the theme of the Conference, a session for members to highlight a variety of nutrition research topics and a session wherein industry experts share their contributions to public health nutrition. To provide a platform for young researchers to share their scientific findings, a Young Researcher's Symposium has been set aside. There are also over 100 poster presentations covering a wide range of nutrition-based research.

I take this opportunity to place on record our sincere gratitude to all who have contributed in successfully organising this Conference which includes all speakers and poster presenters, all participants, as well as all the sponsors. I thank my colleagues in the 15th Council of the NSM for their cooperation and support throughout the year.

Dr Tee E Siong, KMN
president@nutriweb.org.my

Acknowledgements

The Nutrition Society of Malaysia gratefully acknowledges contributions from the following to the 29th Scientific Conference:

Major Sponsors

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Sponsors for NSM Publication Prizes

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Sponsor for Young Researcher's Symposium and Poster Prizes

- International Life Sciences Institute Southeast Asia Region

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Nutrition Month Malaysia 2014

Nutrition Society of Malaysia

Malaysian Dietitians' Association

Malaysian Association for the Study of Obesity

Promoting Healthy Eating Nationwide

Achievements of NMM (2002-2013)

Since its launch in 2002, Nutrition Month Malaysia (NMM) has been observed every April to promote greater awareness of the practice of healthy eating habits among Malaysians. In this 12th year, NMM focuses on the prevention of non-communicable diseases with the theme, **"Eat Right, Move More: Fight Obesity."**

Our nationwide campaign aims to promote greater awareness on healthy eating and active living as the foundation for general good health and wellbeing. We also aim to inculcate healthy eating habits and encourage physical activity from young, so as to improve the nutritional status of Malaysian families.

Family Carnival

- Organised 7 major fun-filled carnivals

School & Kindergarten Roadshows

- Visited 164 primary schools and provided healthy eating and active living messages
- Visited 175 kindergartens and conducted interactive nutrition activities

Publications for Public

- Published 6 practical nutrition guidebooks, 3 recipe books and 1 mini-booklet

Educational Materials for School Children & Preschoolers

- Published comic book and activity book for primary school children
- Published DVD and worksheets for preschoolers

Educational Press Articles

- Published over 80 articles in English, Bahasa Malaysia & Chinese newspapers

Mass Media Promotions

- Disseminated messages through radio, television & website

Visit our website to obtain more information on educational materials from the Nutrition Month Malaysia programme. We also welcome feedback/queries. To reach us, please contact:

The Nutrition Month Malaysia Secretariat
Tel: (03) 5632 3301/5637 3526
Email: enquiry@nutritionmonthmalaysia.org.my
Website: www.nutritionmonthmalaysia.org.my
facebook Nutrition Month Malaysia

In Memoriam: Dr Chong Yoon Hin, Founding President of NSM

In memorium of Dr Chong Yoon Hin,
Founding President, Nutrition Society of Malaysia

The Nutrition Society of Malaysia shares the loss of Dr Chong Yoon Hin, Founding President, who passed away on 30 January 2014, at the age of 82.

Dr Chong joined the Nutrition Division of the Institute for Medical Research in 1958. In 1965, he became the first Malaysian to be appointed as the Head the Nutrition Division in the IMR. He took on the challenge of building up the Division with local scientists and technical staff. For almost 3 decades, he led the Division in conducting various nutrition investigations, ranging from undernutrition in the early days to the emergence of non-communicable diet related diseases in the 1970s. His significant research contributions are clearly evident from the numerous publications on various areas of nutrition, notably in the area of lipid nutrition and community nutrition.

Recognizing the need for a professional body in the field of nutrition in the country, Dr Chong initiated the formation of the Nutrition Society of Malaysia in 1985. He was elected the Founding President of NSM and led the promotion of nutrition science in the country. For the advancement of nutrition science in the region, Dr Chong led the NSM in organizing the 6th Asian Congress of Nutrition (ACN) in 1991. It was a remarkable success, recognizing that NSM was a "young" nutrition society of less than 5 years old. Dr Chong has therefore set the foundation for the growth and expansion of this professional body in the country, in the promotion of nutrition science and community nutritional wellbeing.

The contributions of Dr Chong Yoon Hin to the birth and growth of nutrition in the country will always be remembered and valued. As founder of nutrition in Malaysia, he has paved the way for us to further promote nutrition in the country. We should continue the work that he has started and ensure that nutrition is strengthened and recognized as an important discipline in health promotion and maintenance by all health workers in the country.

E-Siong Tee, PhD
President
Nutrition Society of Malaysia

IMR Nutrition Survey Team
Dr Chong Yoon Hin, Head of Nutrition Division, Institute for Medical Research, headed a team to carry out a series of community nutrition surveys in different parts of the country in the 1980s.


NUTRITION BULLETIN

NSM 1st newsletter 1986
Dr Chong Yoon Hin penning as editor of the 1st newsletter of the NSM, August 1986

NSM 1st Conference 1986
At opening of NSM1st Scientific Conference, 1 March 1986. From left to right, Mr Tee E Siong, Dr Chong Yoon Hin (founding president of the Nutrition Society of Malaysia), Dato' Mak Hon Kam (then Minister of Health), Prof JC Waterloo, Prof Dr Mohd Ismail Noor

NSM 2nd AGM 1987
Dr Chong Yoon Hin, President of NSM chairing the 2nd Annual General Meeting of NSM on, 28 February 1987 (from left to right, Mr Tee E Siong, Dr Chong Yoon Hin, Dr Mohd Ismail Noor, Mrs Ng Soong Lek)

NSM 2nd Conference 1987
Dr Chong Yoon Hin, President of NSM, presenting a souvenir to keynote speaker Dr Rahmat Qureshi, FAO Regional Food Policy and Nutrition Officer, at the NSM 2nd Scientific Conference, 28 February 1987

NSM 4th Conference 1989
Dr Chong Yoon Hin, President of NSM, receiving the guest of honour, Dato' Chiang Siang Sun, then Minister of Health at the NSM 4th Scientific Conference, 18 March 1989

6th Asian Congress of Nutrition
Dr Chong Yoon Hin, President of NSM and President of the 6th Asian Congress of Nutrition welcoming the guest of honour, Dato' Lee Kim Sai (then Minister of Health) to the official opening of the Congress, 16 September 1991

NSM 9th Conference 1994
Dr Chong Yoon Hin, President of NSM, welcoming participants to the NSM 9th Scientific Conference, 27 March 1994

NSM 26th Conference 2011
Dr Chong Yoon Hin, guest of honour at the launch of the NSM Nutritionists' Choice Cookbook, in conjunction with the opening of the NSM 26th Scientific Conference, 24 March 2011

SEA PHN

Southeast Asia Public Health Nutrition Network

(established 2 June 2014)

Southeast Asia Public Health Nutrition Network

A collaboration among

Nutrition Foundation of the Philippines, Inc

Nutrition Society of Malaysia

Food and Nutrition Society of Indonesia

Nutrition Association of Thailand under the Patronage of Her Royal Highness Princess Maha Chakri Sirindhorn

Vietnam Nutrition Association

Aim to bring together the main stakeholders interested in researching, applying and promoting Public health nutrition among the population in the effort of alleviating the nutrition problems in the region

Official Opening

DAY 1 **TUESDAY 3 JUNE, 2014**

0730 hrs	Registration
0900 hrs	**OFFICIAL OPENING** Ballroom A
0900 hrs	Welcome address by Dr Tee E Siong President, Nutrition Society of Malaysia (NSM) A tribute to the late Dr Chong Yoon Hin, (1932-2014)
0915 hrs	Speech and official opening by Yang Berhormat Dato' Seri Dr Hilmi bin Haji Yahya Deputy Minister of Health, Ministry of Health Malaysia • Official launch of Southeast Asia Public Health Nutrition (SEA-PHN) Network • Presentation of NSM Fellows Award • Presentation of NSM Undergraduate and Post-graduate Prizes • Presentation of NSM Publication prizes
0945 hrs	Tour of Trade Exhibition/Scientific Posters by invited guests
0945 hrs	**Refreshment** **Poster Session: presenters in attendance for discussion**

Scientific Programme

DAY 1 **TUESDAY 3 JUNE, 2014**

SYMPOSIUM 1: Improving Lives Through Public Health Nutrition
Chaiperson: Prof Dr Mohd Ismail Noor
Universiti Technologi MARA

1030 hrs **Southeast Asia Public Health Nutrition (SEA-PHN) Network – Promoting Regional Collaboration for Community Nutrition Improvement**
Dr Tee E Siong
Chairman, SEA-PHN Network

1100 hrs **MyBreakfast Study: Breakfast habits of Malaysian Primary and Secondary School Children**
Prof Dr Norimah A Karim
On Behalf of Research Team, Nutrition Society of Malaysia

1130 hrs **Nutritional Status and Dietary Intakes of Children Aged 6 Months to 12 years: Findings of the Nutrition Survey of Malaysian Children (SEANUTS Malaysia)**
Prof Dr Poh Bee Koon
Universiti Kebangsaan Malaysia, Kuala Lumpur

1200 hrs **Public Health Nutrition Issues and Interventions in Indonesia**
Prof Dr Ir Hardinsyah
President, Food and Nutrition Society of Indonesia

1230 hrs **Lunch**

1330 hrs **Poster Viewing / Trade Exhibition**
Poster presenters in attendance for discussion

Note:
- *All scientific sessions shall be in the Ballroom A, Level 1*
- *Poster presentations shall be at Function Room 5 & 6, while trade exhibitions shall be in the Concourse area of Ground floor*
- *Lunch shall be served at Ballroom B*
- *Morning and afternoon refreshments shall be served around the trade exhibition area and foyer outside Ballroom A*

SYMPOSIUM 2: Improving Lives Through Public Health Nutrition
Chairperson: Prof Dr Norimah A Karim
Universiti Kebangsaan Malaysia

1400 hrs **Public Health Nutrition Issues and Interventions in The Philippines**
Dr Rodolfo Florentino
Chairman-President,
Nutrition Foundation of the Philippines, Inc

1425 hrs **Public Health Nutrition Issues and Interventions in Thailand**
Assoc Prof Dr Umaporn Suthutvoravut
President, Nutrition Association of Thailand

1450 hrs **Public Health Nutrition Issues and Interventions in Vietnam**
Prof Dr Le Thi Hop
President, Vietnam Nutrition Association

1515 hrs **Public Health Nutrition Issues and Interventions in Malaysia**
Prof Dr Mohd Ismail Noor
Vice President, Nutrition Society of Malaysia

SYMPOSIUM 3: Young Researcher's Symposium
Chairperson: Assoc Prof Dr Mohd Nasir Mohd Taib
Universiti Putra Malaysia

1540 hrs **Association between body image perception and overweight and obesity among Malaysian adolescents staying in boarding schools**
Lai Soke Chong, Chin YS, Chan YM & Mohd Nasir MT
Department of Nutrition and Dietetics, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia

1555 hrs **Obesity and metabolic health: are they associated with cognitive function in healthy young adolescents?**
Chong Kar Hau, Norimah AK, Ponnusamy S & Poh BK
Nutrition Programme, School of Healthcare Sciences, Faculty of Health Sciences, Universiti Kebangsaan Malaysia

1610 hrs **Development and validation of knowledge, attitude and practice on healthy lifestyle questionnaire (KAP-HLQ) for Malaysian adolescents staying in school hostels**
Hiew Chu Chien, Chin YS, Chan YM & Mohd Nasir MT
Department of Nutrition and Dietetics, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia

1625 hrs **The association between metabolic syndrome risk factors and high-molecular-weight adiponectin among the endangered Orang Asli population in Malaysia**

Lydiatul Shima Ashari, Loy SL, Teh LK, Mohd Zaki S & Hamid Jan JM
Nutrition Programme, School of Health Sciences, Universiti Sains Malaysia

1640 hrs **Physical activity and sleeping duration attenuates the effect of FTO but not MC4R on body mass index and eating behaviour in Malay children**

Chong Pei Nee, Poh BK,Wan Zurinah WN, Ismail MN & Zulhabri O
Nutrition Programme, School of Healthcare Sciences, Faculty of Health Sciences, Universiti Kebangsaan Malaysia

1700 hrs **Refreshment / Trade exhibition**

1830 hrs **CONFERENCE DINNER**
Venue: R-Studio, Level 2, West Wing,
Renaissance Hotel, Kuala Lumpur

Dinner is only for pre-registered Conference participants and invited guests.

DAY 2 **WEDNESDAY 4 JUNE, 2014**

SYMPOSIUM 4: Industry Contributions to Promoting Public Health Nutrition
Chairperson: Dr Tee E Siong
President, Nutrition Society of Malaysia

0900 hrs **PepsiCo's Public Health Nutrition Initiatives**
Ms Yashna Harjani
Asia Pacific Region, PepsiCo

0945 hrs **Nestlé Public Health Nutrition Activities**
Ms Cher Siew Wei
Nestlé (Malaysia) Berhad

1030 hrs **Refreshment / Trade exhibition**

1100 hrs **Effect of fortified milk with FOS-Inulin on bone biomarkers**
Prof Dr Marlena Kruger
Institute of Food, Nutrition and Human Health, Massey University, New Zealand

1145 hrs **The contribution of prebiotic fibres of the inulin type and the slow release carbohydrate Palatinose™ to a healthier, prevention-oriented diet**
Ms Anke Sentko
BENEO Institute, Obrigheim, Germany

1230 hrs **Lunch**

1330 hrs **Poster Viewing / Trade Exhibition**
Poster presenters in attendance for discussion

Note:
- *All scientific sessions shall be in the Ballroom A, Level 1*
- *Poster presentations shall be at Function Room 5 & 6, while trade exhibitions shall be in the Concourse area of Ground floor*
- *Lunch shall be served at Ballroom B*
- *Morning and afternoon refreshments shall be served around the trade exhibition area and foyer outside Ballroom A*

SYMPOSIUM 5a: Nutrition Potpourri
Chairperson: Assoc Prof Dr Zaitun Yassin
Universiti Putra Malaysia

1400 hrs **The relationship between nutritional habits and internet addiction among university students in Kuala Lumpur, Malaysia**
Hasanain Faisal Ghazi, Zaleha MI, Rosnah S, Mohammed AAQ & Tiba NH
Department of Community Health, Universiti Kebangsaan Malaysia Medical Centre

1415 hrs **Low vitamin D status among Malaysian women – What are the possible risk factors?**
Winnie Chee Siew Swee, Nurbazlin M & Chan SP
Department of Nutrition & Dietetics, International Medical University

1430 hrs **Body mass index, weight perception and weight control practices among adolescents in Malaysia**
Ahmad Ali Zainuddin, Azli B, Azahadi O, Cheong SM, Mohamad Hasnan A, Suhaila AG, Mala M
Institute for Public Health, Ministry of Health, Malaysia

1445 hrs **Calcium consumption and its association with bone mineral density of Malaysian adults**
Chong YC, Babei K & Soma Mitra R
School of Biological Sciences, Faculty of Science, University of Nottingham Malaysia Campus

1500 hrs **Development and validation of a questionnaire on knowledge, attitude and practice (KAP) towards whole grains among primary school children aged 10 and 11 years in Kuala Lumpur**
Koo Hui Chin, Poh BK & Ruzita AT
Nutritional Sciences Programme, School of Healthcare Sciences, Faculty of Health Sciences, Universiti Kebangsaan Malaysia

1515 hrs **Refreshment**

SYMPOSIUM 5b: Nutrition Potpourri
Chairperson: Dr Roseline Yap Wai Kuan
Taylor's University

1545 hrs **Effects of media literacy education on television food advertising on school children**
Zalma Abdul Razak, Safiah MY, Ajau D & Khairil Anuar MI
Faculty of Health Sciences, Universiti Teknologi MARA

1600 hrs **MyDIETRISK-BCa: a rapid tool for breast cancer risk assessment based on Malaysian dietary intake pattern**
Mohd Razif Shahril, Suhaina S & Wafa SW
School of Nutrition and Dietetics, Faculty of Medicine and Health Sciences, Universiti Sultan Zainal Abidin

1615 hrs **Reliability and validity of a healthy meal preparation – Knowledge, attitude and practice (HMP-KAP) instrument using Rasch measurement model**
Zuraini Mat Issa, Akbariah MM & Wan Abdul Manan W
Department of Foodservice, Faculty of Hotel and Tourism Management, Universiti Teknologi Mara

1630 hrs **Body composition: Differences between elite national skills sport athletes**
Shareena Delaila Mohd & Chai WJ
Sports Nutrition Centre, National Sports Institute of Malaysia

1645 hrs **Physical activity,] energy expenditure, body composition and energy intake of university students: A descriptive study**
Selvarajah Sarah & Mitra S R
School of Biological Sciences, Faculty of Science, University of Nottingham Malaysia Campus

Prize Giving Ceremony

1700 hrs **Young Researcher's Symposium and Best Undergraduate Poster Prize**

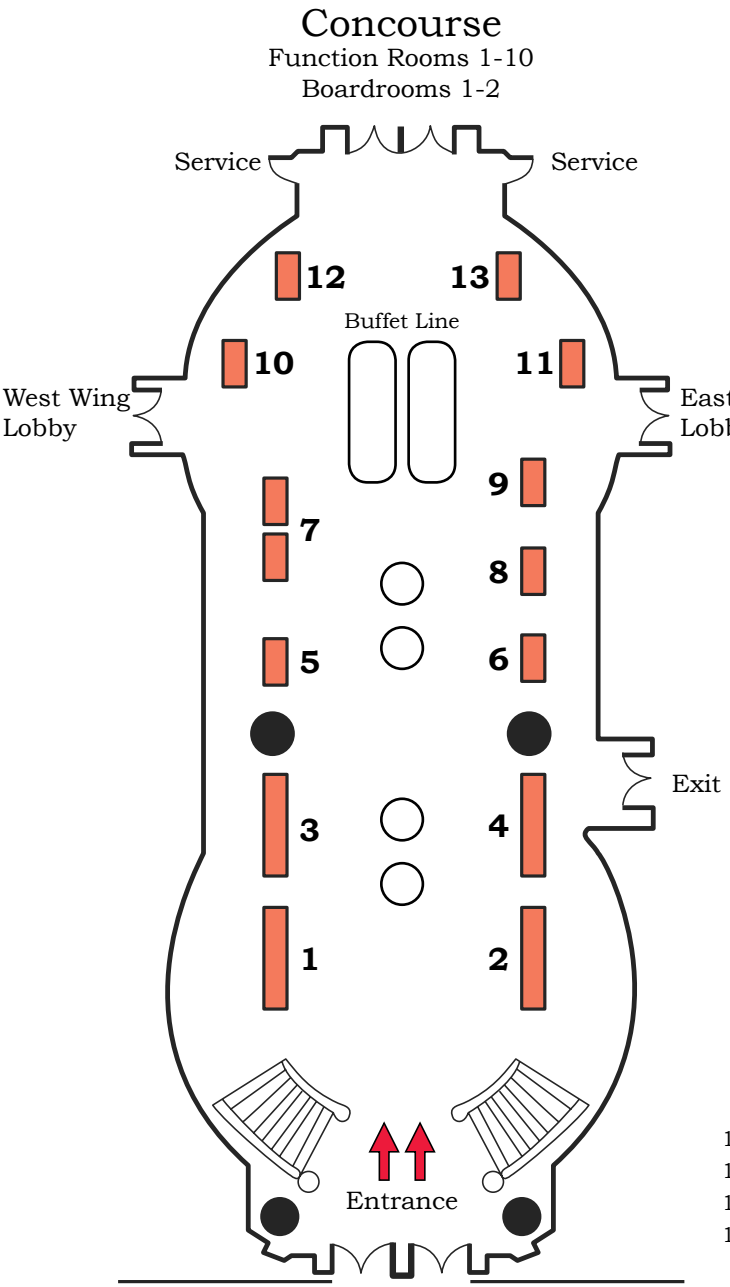
Conference Ends

Exhibition & Poster Session Floorplan

Trade Exhibition

Poster Session

Scientific posters are displayed in Function Rooms 5 & 6



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11. Yakult (Malaysia) Sdn Bhd
12. Legosan (Malaysia) Sdn Bhd
13. Meat & Livestock Australia

NSM Award/Prizes 2014

NSM Fellows Award

The Fellows of NSM are elected by recommendation of the Council based on their outstanding professional and meritorious contributions to the field of nutritional sciences. They consist of Life or Ordinary Members of the Nutrition Society of Malaysia nominated based on their regular contributions to or support of the activities organized by NSM for no less than 10 years.

The NSM Fellows are nominated based on outstanding and meritorious contributions to the field of nutritional sciences as indicated by:

A. Nutrition research projects/programmes
B. Publicatons
C. Consultations (including Working Groups/Technical Commitees)
D. Inventions/Innovations/Patens
E. Awards
F. Community Service

For 2014 in commemoration of the 29th Scientific Conference of the Nutrition Society of Malaysia, the 15th Council is pleased to present NSM Fellows Award to the following members:

- **Prof Dr Winnie Chee Siew Swee (L 242)**
- **Prof Dr Zalilah Mohd Shariff (L 831)**
- **Ms Rusidah Selamat (L 359)**
- **Ms Koo Pei Fern (O 956)**

Approved by the 29th Annual General Meeting of the NSM on 21 March 2014.

NSM Postgraduate and Undergraduate Prizes 2014

Two types of NSM Prizes are awarded under the Education Fund of the Nutrition Society of Malaysia, according to the Bye-Laws of the Society. The NSM Postgraduate Prize is awarded for a thesis accepted for a PhD or MSc degree whereas the Undergraduate Prize is awarded for a thesis accepted for a basic/first degree. Each prize comprises a cash award and a certificate, as follows: RM 1,000 for a PhD thesis, RM 750 for MSc thesis and RM 500 for the undergraduate prize.

In 2014, NSM is awarding five Postgraduate Prizes, two for PhD and three for MSc, with a total cash award of RM 4,250. Six undergraduates receive Undergraduate Prizes with a total cash of RM 3,000. The total cash award for this year is RM 7,250.

The two recipients for the PhD thesis are:

1. **Loy See Ling**
   A prospective study on maternal oxidative stress in pregnancy and post partum and infant adiposity development during the first year of life
   Supervisor: *Dr Hamid Jan Jan Mohamed*
   Co-Supervisor: *Assoc Prof Dr K.N.S. Sirajudeen*
   University: *School of Health Sciences, Universiti Sains Malaysia*

2. **Yvonne Tee Yee Siang**
   Determinants of bone mineral density and the effect of soy isoflavones in premenopausal women in the Klang Valley
   Supervisor: *Assoc Prof Dr Zaitun Yassin*
   Co-Supervisor: *Assoc Prof Dr Norhaizan Mohd Esa,*
   Assoc Prof Dr Chan Yoke Mun
   University: *Faculty of Medicine & Health Sciences,*
   Universiti Putra Malaysia

The three recipients for the MSc thesis are:

1. **Nurul Fadhilah Abdullah**
   The influence of body composition, pubertal growth status and dietary food pattern on bone health among adolescents in Kota Bharu, Kelantan
   Supervisor: *Dr Foo Leng Huat*
   Co-Supervisor: *Assoc Prof Dr Mohd Ezane Aziz*
   University: *School of Health Sciences, Universiti Sains Malaysia*

2. **Law Leh Shii**
   Factors associated with body weight status among 15-17 year old school-going adolescents in Sibu, Malaysia
   Supervisor: *Assoc Prof Dr Mohd Nasir Mohd Taib*
   Co-supervisor: *Assoc Prof Dr Hazizi Mat Saad*
   University: *Faculty of Medicine & Health Sciences, Universiti Putra Malaysia*

3. **Ng Boon Koon**
   Relationship between nutritional status, physical activity and iron status with cognitive ability among Malaysian school children aged 7 to 11 years
   Supervisor: *Prof Dr Poh Bee Koon*
   Co-supervisor: *Assoc Prof Dr Ng Lai Oon (Sunway University, Malaysia)*
   University: *Faculty of Health Sciences, Universiti Kebangsaan Malaysia*

The six recipients for the undergraduate prizes are:

1. **Nik Farhana Nik Khairu Zaman**
   Assessment of physical activity among pregnant women in Hospital USM
   Supervisor: *Dr Soo Kah Ling*
   University: *School of Health Sciences, Universiti Sains Malaysia*

2. **Suraya Mahusin**
   Knowledge, attitude and practice of breastfeeding among pregnant mothers attending obstetrics and gynecology clinic, Hospital USM
   Supervisor: *Dr Sharifah Zahirah*
   University: *School of Health Sciences, Universiti Sains Malaysia*

3. **Lee Siew Siew**
   In vitro inhibitory potential of selected legumes against pancreatic lipase
   Supervisor: *Assoc Prof Dr Loh Su Peng*
   University: *Faculty of Medicine & Health Sciences, Universiti Putra Malaysia*

4. **Nur Sabrina Zulkefli**
   Factors associated with sarcopenia among institutionalized elderly aged 60 years and above at Rumah Seri Kenangan in Cheras and Seremban
   Supervisor: *Assoc Prof Dr Zaitun Yassin*
   University: *Faculty of Medicine & Health Sciences, Universiti Putra Malaysia*

5. **Ng Say Teng**
   Relationship between Healthy Eating Index with weight status among older adults in Kuala Lumpur
   Supervisor: *Prof Dr Norimah A.Karim*
   University: *Faculty of Health Sciences, Universiti Kebangsaan Malaysia*

6. **Nor Afifah Shabri**
   Evaluation of food composition of salted fish in Terengganu and its relation with genotoxicity profile
   Supervisor: *Dr Razinah Sharif @ Mohd Sharif*
   Co-Supervisor: *Assoc Prof Dr Ahmad Rohi Ghazali*
   University: *Faculty of Health Sciences, Universiti Kebangsaan Malaysia*

NSM Publication Prizes 2014

The NSM Publication Prize is aimed at encouraging and promoting local research publications in nutrition science. Prizes are awarded by the Nutrition Society of Malaysia with financial support from Corporate Members of the Society.

Four categories of NSM Publication Prize were offered in 2014. These are for different fields of nutrition research, namely: Infant and Childhood Nutrition; Maternal Nutrition; Dairy Nutrition and Bone Health & Nutrition.

Members are encouraged to apply for these Publication Prizes which are offered in 2015. The announcements for these prizes are given in this Programme and Abstract book.

NSM Publication Prize: Infant and Childhood Nutrition

For the Publication Prize in the field of infant and childhood nutrition, for the years 2008-2014, these prizes are sponsored by Dutch Lady Milk Industries Bhd. There shall be a maximum of 3 awards each year, each to carry a cash prize of RM 2,000 and a certificate by the NSM.

For the year 2014, eight applications were received for this category. The Selection Committee has decided that only 4 applications were of the required merit for the prize. The winners are as follows:

Name of recipient: **Dr Foo Leng Huat**
School of Health Sciences, Universiti Sains Malaysia, Health Campus

Publication: Relationship between anthropometric and dual energy X-ray absorptiometry measures to assess total and regional adiposity in Malaysian adolescents.
Asia Pacific Journal of Clinical Nutrition 2013;22(3):348-56.

Name of recipient: **Nurliyana binti Abdul Razak**
Department of Nutrition and Dietetics, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia

Publication: Dietary patterns and cognitive ability among 12- to 13 year-old adolescents in Selangor, Malaysia.
Public Health Nutrition 2013; doi: 10.1017/S1368980014000068.

Name of recipient: **Prof Dr Poh Bee Koon**
Nutrition Programme, School of Healthcare Sciences,
Faculty of Health Sciences,
Universiti Kebangsaan Malaysia

Publication: Nutritional status and dietary intakes of children aged 6 months to 12 years: findings of the Nutrition Survey of Malaysian Children (SEANUTS Malaysia).
British Journal of Nutrition 2013; 110:S21–S35.

Name of recipient: **Dr Sharifah Wajihah Wafa bte Syed Saadun Tarek Wafa**
Faculty of Medicine and Health Sciences, Universiti Sultan Zainal Abidin

Publication: Randomised controlled trial of a good practice approach to treatment of childhood obesity in Malaysia: Malaysian Childhood Obesity Treatment Trial (MASCOT).
International Journal of Pediatric Obesity 2011; 6: e62-e69.

NSM Publication Prize: Maternal Nutrition

For the Publication Prize in the field of Maternal Nutrition, for the year 2012-2015, these prizes are sponsored by Fonterra Brands (M) Sdn Bhd. There shall be a maximum of 1 award each year, each to carry a cash prize of RM 2,000 and a certificate by the NSM.

For the year 2014, no applications for this Prize were received.

NSM Publication Prize: Dairy Nutrition

For the Publication Prize in the field of Dairy Nutrition, for the year 2012-2015, these prizes are sponsored by Fonterra Brands (M) Sdn Bhd. There shall be a maximum of 1 award each year, each to carry a cash prize of RM 2,000 and a certificate by the NSM.

For the year 2014, no applications for this Prize were received.

NSM Publication Prize: Bone Health and Nutrition

For the Publication Prize in the field of Bone Health and Nutrition, for the year 2012-2015, these prizes are sponsored by Fonterra Brands (M) Sdn Bhd. There shall be a maximum of 1 award each year, each to carry a cash prize of RM 2,000 and a certificate by the NSM.

For the year 2014, no applications for this Prize were received.

NSM Young Researcher's Symposium Prizes 2014

Winners of the Young Researcher's Symposium are awarded a certificate and the following cash prizes:

1st Prize – RM400

2nd Prize – RM300

3rd Prize – RM200

2 Consolation Prizes of RM100 each

The 1st Prize is provided by International Life Sciences Institute (ILSI) Southeast Asia Region, Singapore

The other prizes are by the Nutrition Society of Malaysia.

NSM Poster Competition Prizes 2014

This poster competition is only for undergraduates. Winners are awarded a certificate and the following cash prizes:

1st Prize – RM200

2nd Prize – RM150

3rd Prize – RM100

6 Consolation prizes of RM50 each

The 1st Prize is provided by International Life Sciences Institute (ILSI) Southeast Asia Region, Singapore

The other prizes are by the Nutrition Society of Malaysia.

Announcements
NSM Publication Prizes 2015

Applications are invited for:

1. Maternal Nutrition

Members of the Nutrition Society of Malaysia (NSM) are invited to apply for the NSM Publication Prize: Maternal Nutrition

Objective:
To encourage and promote local research publications in the field of maternal nutrition.

The Prize:
There shall be a maximum of 1 award each year, each to carry a cash prize of RM 2,000 and a certificate by the NSM. For the years 2012-2015, this Prize shall be sponsored by Fonterra Brands (M) Sdn Bhd.

Applications for the Prize:
Members of NSM are invited to submit their publications following a prescribed procedure given below. Applications shall be considered by a Selection Committee. The selection shall be based on a set of prescribed criteria described below.

Presentation of awards:
Prizes are to be presented during the opening ceremony of the Annual Scientific Conference of the Nutrition Society of Malaysia. Winners shall be invited to attend the ceremony, at his/her own expense, to receive the prize from the Guest of Honour officiating the opening ceremony.

Application procedure:
1. The NSM Council shall invite applications for the Publication Prize through NutriWeb (www.nutriweb.org.my), research institutions, academia and government departments.
2. Applicants must be Malaysian citizens and Ordinary (with no outstanding membership fees) or Life members of NSM.
3. Applications must be received before **15 April 2015.**

4. Applicants must submit 15 copies of each published paper to be considered by the Selection Committee and the following details:
    a. Name
    b. NSM membership number
    c. Address of work place
    d. Address for correspondence
    e. Email, phone and fax
    f. A note indicating intent to apply for consideration for the publication prize and stating the number of publications submitted as well as the full details of each publication (author(s), title of publication, journal details)
5. Provide a statement stating why the submitted publication(s) should be considered for the Prize, pointing out, for example, significance of study and findings, its usefulness and impact.
6. All applications must reach the President at the following address before the stipulated deadline:

    President
    Nutrition Society of Malaysia
    c/o 46, Jalan SS22/32
    47400 Petaling Jaya
    Selangor DE
7. For enquiries, email the President at: president@nutriweb.org.my.

Criteria for Selection:

1. Publication(s) submitted for consideration by the Selection Committee must be in the field of nutrition of Malaysian infant and children (up to 18 years), arising from human intervention, epidemiology or clinical studies or critical reviews.
2. The publication(s) must be in the English language, published in a peer reviewed journal, in the year 2010 and later. There is no limit to the number of publications submitted for consideration.
3. The applicant must be the first author of the publication(s) submitted for consideration.
4. Selection of winners shall be based on multiple criteria, including relevance to focus area of Publication Prize, relevance to national nutrition scene, soundness of research methodology and overall presentation of the publication.
5. Criteria for selection may be amended from time to time by the NSM Council.
6. Decision of the Selection Committee is final.

May 2014

2. Dairy Nutrition

Members of the Nutrition Society of Malaysia (NSM) are invited to apply for the NSM Publication Prize: Dairy Nutrition.

Objective:
To encourage and promote local research publications in the field of dairy nutrition.

The Prize:
There shall be a maximum of 1 award each year, each to carry a cash prize of RM 2,000 and a certificate by the NSM. For the years 2012-2015, this Prize shall be sponsored by Fonterra Brands (M) Sdn Bhd.

Applications for the Prize:
Members of NSM are invited to submit their publications following a prescribed procedure given below. Applications shall be considered by a Selection Committee. The selection shall be based on a set of prescribed criteria described below.

Presentation of awards:
Prizes are to be presented during the opening ceremony of the Annual Scientific Conference of the Nutrition Society of Malaysia. Winners shall be invited to attend the ceremony, at his/her own expense, to receive the prize from the Guest of Honour officiating the opening ceremony.

Application procedure:
1. The NSM Council shall invite applications for the Publication Prize through NutriWeb (www.nutriweb.org.my), research institutions, academia and government departments.
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3. The applicant must be the first author of the publication(s) submitted for consideration.
4. Selection of winners shall be based on multiple criteria, including relevance to focus area of Publication Prize, relevance to national nutrition scene, soundness of research methodology and overall presentation of the publication.
5. Criteria for selection may be amended from time to time by the NSM Council.
6. Decision of the Selection Committee is final.

May 2014

3. Bone Health & Nutrition

Members of the Nutrition Society of Malaysia (NSM) are invited to apply for the NSM Publication Prize: Bone Health & Nutrition

Objective:
To encourage and promote local research publications in the field of bone health & nutrition.

The Prize:
There shall be a maximum of 1 award each year, each to carry a cash prize of RM 2,000 and a certificate by the NSM. For the years 2012-2015, this Prize shall be sponsored by Fonterra Brands (M) Sdn Bhd.

Applications for the Prize:
Members of NSM are invited to submit their publications following a prescribed procedure given below. Applications shall be considered by a Selection Committee. The selection shall be based on a set of prescribed criteria described below.

Presentation of awards:
Prizes are to be presented during the opening ceremony of the Annual Scientific Conference of the Nutrition Society of Malaysia. Winners shall be invited to attend the ceremony, at his/her own expense, to receive the prize from the Guest of Honour officiating the opening ceremony.

Application procedure:
1. The NSM Council shall invite applications for the Publication Prize through NutriWeb (www.nutriweb.org.my), research institutions, academia and government departments.
2. Applicants must be Malaysian citizens and Ordinary (with no outstanding membership fees) or Life members of NSM.
3. Applications must be received before **15 April 2015.**
4. Applicants must submit 15 copies of each published paper to be considered by the Selection Committee and the following details:
    a. Name
    b. NSM membership number
    c. Address of work place
    d. Address for correspondence
    e. Email, phone and fax
    f. A note indicating intent to apply for consideration for the publication prize and stating the number of publications submitted as well as the full details of each publication (author(s), title of publication, journal details)
5. Provide a statement stating why the submitted publication(s) should be considered for the Prize, pointing out, for example, significance of study and findings, its usefulness and impact.

6. All applications must reach the President at the following address before the stipulated deadline:
   President
   Nutrition Society of Malaysia
   c/o 46, Jalan SS22/32
   47400 Petaling Jaya
   Selangor DE
7. For enquiries, email the President at: president@nutriweb.org.my.

Criteria for Selection:

1. Publication(s) submitted for consideration by the Selection Committee must be in the field of nutrition of Malaysian infant and children (up to 18 years), arising from human intervention, epidemiology or clinical studies or critical reviews.
2. The publication(s) must be in the English language, published in a peer reviewed journal, in the year 2010 and later. There is no limit to the number of publications submitted for consideration.
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May 2014

List of Posters

Scientific posters have been grouped into the following themes and shall be presented according to the following schedule:

Day 1: Poster themes A & E
Day 2: Poster themes B, C, D & F

Poster themes:

A = Nutritional Status (various groups) and Community Interventions
B = Dietary Intake, Consumption Pattern and Diseases
C = Nutrients and Other Components in Food / Products
D = Clinical Nutrition / Intervention Trials
E = Food Science and Technology
F = Experimental Nutrition

The best 3 posters put up by undergraduates shall be awarded cash prizes!

Poster Presentations: Day 1 (Groups A and E)

Group A: Nutritional Status (various groups) and Community Interventions

A01 Association of nutritional status and prevalence of diseases among institutionalized elderly in Klang Valley
Amutha R and Sasimalani S

A02 Development, implementation and effectiveness of intensive nutrition education program on healthy eating tailored for school adolescent in Kelantan
Qi Jack Chang and Hafzan, Y

A03 Association between body image perception, dietary practice, and physical activity with body weight status among undergraduate students in Universiti Putra Malaysia
Cheng KY and Mohd Nasir MT

A04 Assessment of anaemia prevalence, knowledge and attitude regarding iron deficiency anaemia among female university staff of childbearing age in Kelantan
Cheong CY and Hafzan Y

A05 Vitamin D status of the Malay adolescents in the Klang Valley
Chew WF, Leong PP, Boo NY, Woo LF, Liew SF, Yee CKW, Soh AXR and Chee WSS

A06 Teachers' perception and acceptance against School Supplementary Feeding Programme (SSFP) or Rancangan Makanan Tambahan (RMT)
Chong E and Sharifah Zahhura SA

A07 Assessment of nutritional status and dental caries among adults aged 19-59 years attending government dental clinics in Klang Valley
M. Dhivya and Satvin K

A08 Associations of psychological stress domains and metabolic biomarkers among Malaysian adults
Tan LS, Chong HZ and Barua A

A09 Body mass index and the risk of excessive gestational weight gain among third trimester pregnant women in Bachok district, Kelantan.
Fiona LWT, Rohana AJ and Naing NN

A10 Assessment of nutritional status and physical activity level of trishaw peddlers in Kota Bharu, Kelantan and Kuala Terengganu, Terengganu
Foo SM and Wan Abdul Manan WM

A11 Vitamin D status and its association with adiposity among multi-ethnic teachers in Wilayah Persekutuan Kuala Lumpur
Shafinaz IS and Moy FM

A12 Association of body mass index to risk of cardiovascular disease mortality and all-cause mortality in Malaysian adults
Kee CC, Sharmini S, Jamaiyah H, Sumarni MG, Lim KH, Gurpreet K, Tee H, Ahmad Faudzi Y and Amal NM

A13 Measurement of physical activity level among malay and chinese female students of food science program in UKM: Questionnaire and pedometer
Kee JL and Arnida Hani T

A14 Association of weight status with socio-demographic factors, sleep quality, nutrient intake among working adults
Misra S, Kong Pun Pun and Sami Abdo Rahman AD

A15 Associations of socio-demographic factors with body mass index and waist circumference of Malaysian preschoolers
Lee ST and Poh BK

A16 Vitamin D status and its associated factors in healthy pregnant mothers and their newborns
Lee SS and Loh SP

A17 Development and evaluation of weight reduction booklet for overweight and obese working adults
Lee YW and Zahara AM

A18 Associations of health literacy and metabolic parameters amongst Malaysian adults
Lew Li Cian, Megan Chong Hueh Zan and Ankur Barua

A19 Physical activity and cognitive function among preschool children in Segamat, Johor
Lim CH, Haslinah A and Serene Tung EH

A20 Body image perception, perfectionism and risk of eating disorders among Malay adolescents in Kuala Lumpur
Lim JS, Ang YN, Chong KH, Wee BS, Ponnusaami S and Poh BK

A21 Printed educational nutrition materials: Assessment and acceptance among secondary school students in Perlis
Mohamad Farmi Hisham J, Raduan S and Ruzita AT

A22 Food insecurity, school performance and behaviour of primary school children among low income households in Shah Alam, Selangor
Mohamad Sharizan AH and Sarina S

A23 Factors associated with waist-to-height ratio (WtHR) among male Malay adolescents in SMK Tun Perak, Jasin, Melaka
Mohd Nabil Fikri R and Rosita J

A24 Prevalence and correlates of physical disability among free living elderly in Mukim Batu, Gombak District of Selangor
Muhammad Faizal M, Zuriati I, Zaitun Y, Siti Nur'Asyura A and Chan YM

A25 Pregnant women's knowledge, beliefs and attitudes regarding gestational weight gain in Kota Bharu, Kelantan
Nazirah Wahidah M.Z and Soo K.L

A26 Knowledge, attitude, and practice associated to Human Papillomavirus (HPV) Vaccination among Final Year Undergraduate students in Universiti Putra Malaysia, Serdang Selangor
Nazratul A and Mary H

A27 Relationship between parental perception of neighbourhood environment and safety with physical activity among Malaysian school children
Ng XH and Serene Tung EH

A28 A pilot study of nutrition practice guideline in the management of childhood obesity
Nor Baizura MY, Zalilah MS, Hwu TT, Ruzita AT and Nicola S

A29 Prevalence of overweight and obesity among secondary school teachers in Malaysia
Norhayati M, Chin YS, Hiew CC, Chan YM, and Mohd Nasir MT

A30 An intervention study on the effectiveness of calorie labeling on adolescents' energy intake from the school canteen
Nur Eldzariah Idma MR and Rosita J

A31 Association of quality of life and BMI among Malay primary school children in Ulu Kinta, Perak
Nur Faizah AAS and Ruzita AT

A32 Frailty and nutritional status among older adults in Perak and Kelantan
Nur Farhana MR, Suzana S, Manal B and Devinder KAS

A33 Relationship between knowledge, attitudes, and behaviours on hydration and hydration status of national weight category sports athletes
Nur Hanesa E, Hazizi AS and Haemamalar K

A34 The obesogenic environment and its relationship with nutritional status and physical activity level among secondary school students in Kuala Lumpur
Nur Izzani K, Sameeha MJ, Ruzita AT and Poh BK

A35 The measurement of sedentary levels and patterns using the activPALTM professional physical activity monitor among obese children aged 9-11 years old: The preliminary findings.
Nadzirah A, Razif S, Hasmiza H, Marhasiyah R and Wafa S.W

A36 Association between quality of life and socioeconomic status among primary school of children in Gombak, Selangor
Nur Safwanah D and Ruzita AT

A37 The relationship of lifestyle factors and body weight status among undergraduate students in Universiti Putra Malaysia
Nur Syazwani R and Zalilah MS

A38 Factors, coping strategies related to food insecurity and nutritional status among Orang Asli women in Gombak, Selangor
Nurfahilin T and Norhasmah S

A39 Dietary acculturation and anthropometric measurements among orang asli adults in Gombak, Selangor
Nurul Hidayah MY and Norhasmah S

A40 Development of the Malaysian growth reference (5-18 years) using national survey data and comparison with WHO Growth Reference
Nuur Hafizah MI, Kee CC, Sumarni MG, Ahmad Faudzi Y, Mohd Hanif Z, Jamalludin AR, Ahmad Ali Z, Rusidah S, Hazizi AS, Junidah R, Teh WS, Suzana S, Poh BK and Amal NM

A41 The relationship between nutrition knowledge, lifestyle and BMI among adolescents in Hulu Langat District
Nuurol Ainnaa MZ, Zuriati I and Rosita J

A42 The validity and reliability of pregnancy physical activity questionnaire Malay version (PPAQ-M)
Puteri SM, Rohana AJ, Soo KL, Tengku Alina, TI and Wan Manan, WM

A43 An evaluation of printed health educational materials: A strategy for improving dissemination of health messages to public.
Rabiatul Adawiyah M, Ruzita AT and Raduan S

A44 Normal weight and overweight Malaysian army personnel in Kuala Lumpur: Comparison of nutritional status, dietary and lifestyle practices
Nadiy I, Razalee S, Zalifah MK and Zulkeffeli MJ

A45 Overweight and obesity among children aged 7-9 years in Saudi Arabia: prevalence and its associated factors with dietary intake
Roaa O, Zuriati I, Norhasmah S and Fahaid H

A46 Prevalence of Malnutrition Among Newly Enrolled Students of Primary School and its Associated Factors in Kota Bharu, Kelantan
Rohana AJ, Mas Ahmad Sherzkawi, Shigeru Y and Wan Mohd and Zahiruddin, W.M

A47 Diet and physical activity among pregnant women in Selangor
'Amyra R, Norefin R, Nur Amirah MN, Nurul Aisyah R, Safiah MY, and Jamilah A

A48 Body image perception and nutritional status among female adolescents in Klang, Selangor
Melanie Jessica A and Sarina S

A49 Development and evaluation on the acceptability of a nutrition educational module for overweight and obese adolescents
Sau PL, Lau XC, Ruzita AT, Wong JE and Koh D2 and Poh BK

A50 Factors associated with physical activity level among 13-14 year old students from a selected school in Ledang, Johor.
Siti Aisyah AR, and Mohd Nasir MT

A51 Factors related with duration of any breastfeeding among Malay mothers in Hulu Langat district
Siti Farhana M, Barakatun Nisak MY and Siti Shafurah A

A52 Factors associated with body weight status among Malay housewives in Baling
Siti Nadziah CT, and Mohd Nasir MT

A53 Assessment of nutritional status, abdominal obesity and level of physical activity among shift working female nurses in Hospital Universiti Sains Malaysia
Maria Wong Siaw Ming, Rohana Abdul Jalil and Siti Nurshabani Salleh

A54 Association of early life and early feeding practices on nutritional status of Malay preschoolers independently of socio-demographic status, parental body mass index and dietary behavioral practices
Suhaida CY and Foo LH

A55 Weight-for-age, height-for-age and BMI-for-age for Malaysian preschool children (2-5 years): Comparison with WHO Growth Standards
Sumarni MG, Kee CC, Nuur Hafizah MI, Ahmad Faudzi Y, Mohd Hanif Z, Jamalludin AR, Ahmad Ali Z, Rusidah S, Hazizi AS, Junidah R, Teh WS, Suzana S, Poh BK and Amal NM

A56 Knowledge, attitude, and practices on the use of nutrition and food labelling between nutrition and non-nutrition students in Universiti Putra Malaysia, Serdang Selangor
Suriana A and Norhasmah S

A57 The nutritional knowledge, attitude and practice of children and adolescent from an orphanage institution in Kuala Lumpur and their nutritional status: A preliminary study
Syimir S, Mohd Dzulkhairi MR, Wan Noraini WS, Nazefah AH, Kharun Nain NA, Mohd Yunus A and Zairina AR

A58 Assessment of total body water, fat-free mass and fat mass using bioelectrical impedance analysis (BIA) among distance runners
Tan JW and Tan SY

A59 Body mass index, dietary components and HbA1c level among non-diabetic adults in Klang
Tan SH and Tasneem S

A60 Association of body weight status with eating behaviours, self-efficacy and nutrition knowledge among working adults
Misra S, TTL, Jason and Sami Abdo Rahman Al-Dubai

A61 Metabolic risk factors among institutionalized elderly in Selangor
Keerthanaa G, Sarina S and Tasneem S

A62 The association of breastfeeding practice and physical activity level with postpartum weight changes among mothers in selected medical centres in Selangor and Wilayah Persekutuan
Yamuna T, Sarina S and Ummu Aiman H

A63 Anthropometric measurements and nutrient intake of institutionalized elderly with different categories of denture status in Selangor
Velsri Sharminie S and Nurul Farhana R

A64 Overweight mother/stunted child pairs among Orang Asli households (double-burden households) in Krau Wildlife Reserve, Malaysia
Wong CY, Zalilah MS, Norhasmah S, Siti Nur' Asyura A and Chin YS

A65 Development and evaluation of nutrition guidebook for pregnant women
Wong SF and Zahara AM

A66 Development and evaluation of an education module on physical activity for overweight and obese adolescents
Wong YL, Lau XC, Wong JE, Koh D, Ruzita AT, Hazizi AS, Razalee S, Jamil AT and Poh BK

A67 Prevalence of mis-reporting of energy intake in Malay children varies based on application of different cut-points
Yang WY, Burrows T, Collins CE, MacDonald-Wicks L, Williams LT and Chee WSS

A68 Knowledge, attitude and practice (kap) and nutritional status of preschool children: an association with early childhood caries in Bachok, Kelantan, Malaysia.
Yasmin A, Ruhaya H, Nurhafizah G and Rosmaliza R

A69 Pattern of gestational weight gain among pregnant women
Yong HY, Zalilah MS, Koo SJ and Norul SS

Group E: Food Science and Technology

E01 The effects of brown rice powder addition on nutritional composition and acceptability of some selected traditional rice-based local kuih
Alice CLV and Wan Rosli W

E02 Evaluation of palatability and retention of ascorbic acid and mineral contents in selected vegetables prepared with different types of cooking methods
Chin WK and Marina AM

E03 The pharmacochemistry and chemiluminescence property of Camellia extracts
NIL Ishak, HF Mohsin and I Abdul Wahab

E04 Effect of extraction solvent on antioxidant activity of pomegranate peel extract
Idries Muhson AM

E05 Germinated brown rice 80% methanol crude extract induced glucagon-like peptide-1 and cholecystokinin release from STC-1 enteroendocrine cell line
Kuan WB, Loh SP, Norhaizan ME and Ng OC

E06 Effect of storage duration and different storage temperature on potassium retention in selected green leafy vegetables
Lee SY and Chan YM

E07 Ultrasound-assisted extraction of germinated brown rice against pancreatic lipase, adipogenesis and adipolysis in 3T3-L1 adipocytes
Lim SM, Loh SP and Goh YM

E08 Dietary fiber, total antioxidant activity and antioxidant vitamins of *Oxalis barrelieri* juice
Lim YL and Norfarizan-Hanoon NA

E09 The effect of *Kappaphycus alvarezii* in freshwater fish - *Puntius gonionotus* ball: evaluation on nutritional composition, total phenolic content and antioxidant activity
Ng LT and Norfarizan-Hanoon NA

E10 Effect of cutting and blanching on the physical properties and sensory quality of winged bean ulam (*Psophocarpus tetragonolobus* (L.) DC)
Amiza AN and Aminah A

E11 Effect of washing on content of pesticide residue in organic and conventional vegetables
Syeril SR, Aminah A and Rahmah MR

E12 Use of ORAC and TPC to assess effect of breed on antioxidant capacity of goat's milk in Malaysia
Saif Alyaqoubi, Aminah A, Muhamad S, Norrakiah A and Zuhair RA

E13 Evaluation of fruit leathers made from two cultivars of papaya
Zuhair RA, Aminah A and Sahilah AM

Poster Presentation: Day 2 (Groups B, C, D and F)

Group B: Dietary Intake, Consumption Pattern and Diseases

B01 Adolescents' perception of paternal and maternal parenting styles, dietary intake and body mass index in secondary schools in Hulu Langat district
Aainaa Syarfa MS, Zuriati I and Mohd Nasir MT

B02 Dietary intake and physical activity are associated with the prevalence of metabolic syndrome in Indian adults living in Klang Valley
Leong ZC, Chuah KA, Yeak ZW, Balasubramanian G, Sundram K and Karupaiah T

B03 Hydration practices and perceptions of distance runners
Sim ASS and Tan SY

B04 Correlations of personal factors and parental feeding practices with fruit and vegetable intake among school children
Amy Syahida AS and Gan WY

B05 Knowledge of dietary fats and lipid profiles level among adults in Klang Valley
Ang PC and Sarina S

B06 Fruits and vegetables intake among adolescents in Kuala Selangor, Selangor
Anis Syuhada Z and Ruzita AT

B07 Relationship between healthy eating index with socio-demographic factors and weight status among Chinese adults in Kuala Lumpur
Chong SP and Norimah AK

B08 Calorie labeling and food selection among consumers at selected fast food restaurants
Chong XR and Yap RWK

B09 Eating habits and risk of eating disorders among young Malay adolescents aged 10-14 years in Kuala Lumpur
Choong XF, Wong JE, Ponnusaami S, Ang YN and Poh BK

B10 Nutritional supplement consumption, perceived psychological status and quality of life among university students
Erica W and Lee LK

B11 Nutrition information panel (NIP): Knowledge, attitude and practice (KAP) among adults in Kuala Langat, Selangor
Fizra S, Raduan S and Ruzita AT

B12 Associations of family mealtime frequency, atmosphere and dietary intake on the body weight status of primary school children in Seremban, Negeri Sembilan
Ho SM and Serene Tung EH

B13 A study of walking and food intake among female food science students in UKM
Ika Aida Aprilini M and Arnida Hani T

B14 Fruits and vegetables intake among Malay primary school children in Kuala Selangor
Intan Nur Zahirah M. and Ruzita AT

B15 Perception and acceptance on School Supplementary Feeding Programme (SSFP)/Rancangan Makanan Tambahan (RMT) among parents in several primary schools in Kota Bharu
Isma Amirah I and Sharifah Zahhura SA

B16 Factors associated with eating behaviour among secondary school students in Klang
Kavitha Munandy and Mohd Nasir MT

B17 Positive attitude but not knowledge is associated with nutrition fact label use among health students
Lau SP and Marina AM

B18 Food insecurity and diet quality among Malay women from low income household in Kelantan
Lee JN and Roslee R

B19 Influence of socio-demographic status, parental characteristics, and dietary and lifestyle practices on sugar-sweetened beverage consumption among Chinese preschoolers in Kota Bharu, Kelantan
Lee YH and Foo LH

B20 The consumption of breakfast cereals: Its association with nutritional status among children in Seremban, Negeri Sembilan.
Loh PY and Ruzita AT

B21 Maternal awareness on the importance of folic acid consumption during pregnancy in Kota Bharu, Kelantan
Low PK and Soo KL

B22 Intake level of carcinogenic charcoal-grilled foods among Kota Kinabalu local community
Mohd. Nazri AR and Haslinda AA

B23 Association of whole grain consumption pattern with body weight status among rural adolescents in Kuala Selangor
Rafsanjani Z and Norimah AK

B24 Effect of television (TV) viewing hours, consumption of energy density of food and drinks while watching TV on weight status of working adults
Misra S, Neo WJ and Sami Abdo Rahman AD

B25 Dental caries, BMI and sugar consumption among school going children in Cheras, Kuala Lumpur
Ng KL and Satvin K

B26 Dietary intake, physical activity, perceived stress, weight teasing and its association with body weight status among secondary school students in Hulu Langat District of Selangor
Nor Mazni I, Zuriati I and Rosita J

B27 Food insecurity, nutritional status and dietary behavior in People's Housing Project (PHP) at Kg Muhibah, Puchong, Selangor
Norhidayah H and Norhasmah S

B28 Factors associated with binge eating behaviour among adolescents aged 13-16 years old in Kajang, Selangor
Normasliana M and Gan WY

B29 Fish consumption patterns among adults of different ethnics in Peninsular Malaysia
Nurul Izzah A, Wan Rozita WM, Tengku Rozaina TM and Nasriyah CH

B30 Hedonic ratings and consumption of breakfast among recruits in basic recruit training
Nurhazwani A, Siti Syazwani A, Rosita J and Hazrina G

B31 Consumption patterns and perception of functional foods among Chinese women in Kota Bharu, Kelantan
Ong JY and Soo KL

B32 Children's soft drinks intake in family environment: a case study in Malaysia selected areas
Phua EK and Wan Mohamed Radzi CWJ

B33 TMPRSS6 (rs855791) polymorphisms in relations with haemoglobin levels, maternal medical history, socioeconomic factors and dietary intake among pregnant women attending antenatal clinic in Jerantut, Pahang
Sam ST, Cheong WM, Vun VF, Ang YK, Shashikala S, Rahim WA4 and Cheong SM

B34 Body image and disordered eating in Malaysian adolescents: Findings from the Malaysian Overweight and Disordered Eating Survey among Teens (M.O.D.E.S.T)
Sharifah Intan Zainun SI, Chin YS, Fara Wahida R, Kaartina S, Zalilah MS and Mohd Nasir MT

B35 Picky eating, food neophobia, and body weight status among preschoolers aged 4 to 6 years old in Tabika Perpaduan Tampin, Negeri Sembilan
Siti Fatihah M and Gan WY

B36 Disordered eating and non-disordered eating among male adolescents: comparison of psychological factors, dietary practices and physical activity
Teng CY and Chin YS

B37 Do dairy products consumption influence cardiometabolic risk factors among young adolescents?
Aina SM, Wee BS and Poh BK

B38 Nutrient intake during a nine-course Chinese style dinner
Ooi YBH

B39 Sun exposure, food intake and estimated vitamin D amount among adults in Kuala Lumpur and Selangor
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*Amount recommended for cholesterol lowering effect is 3g per day.
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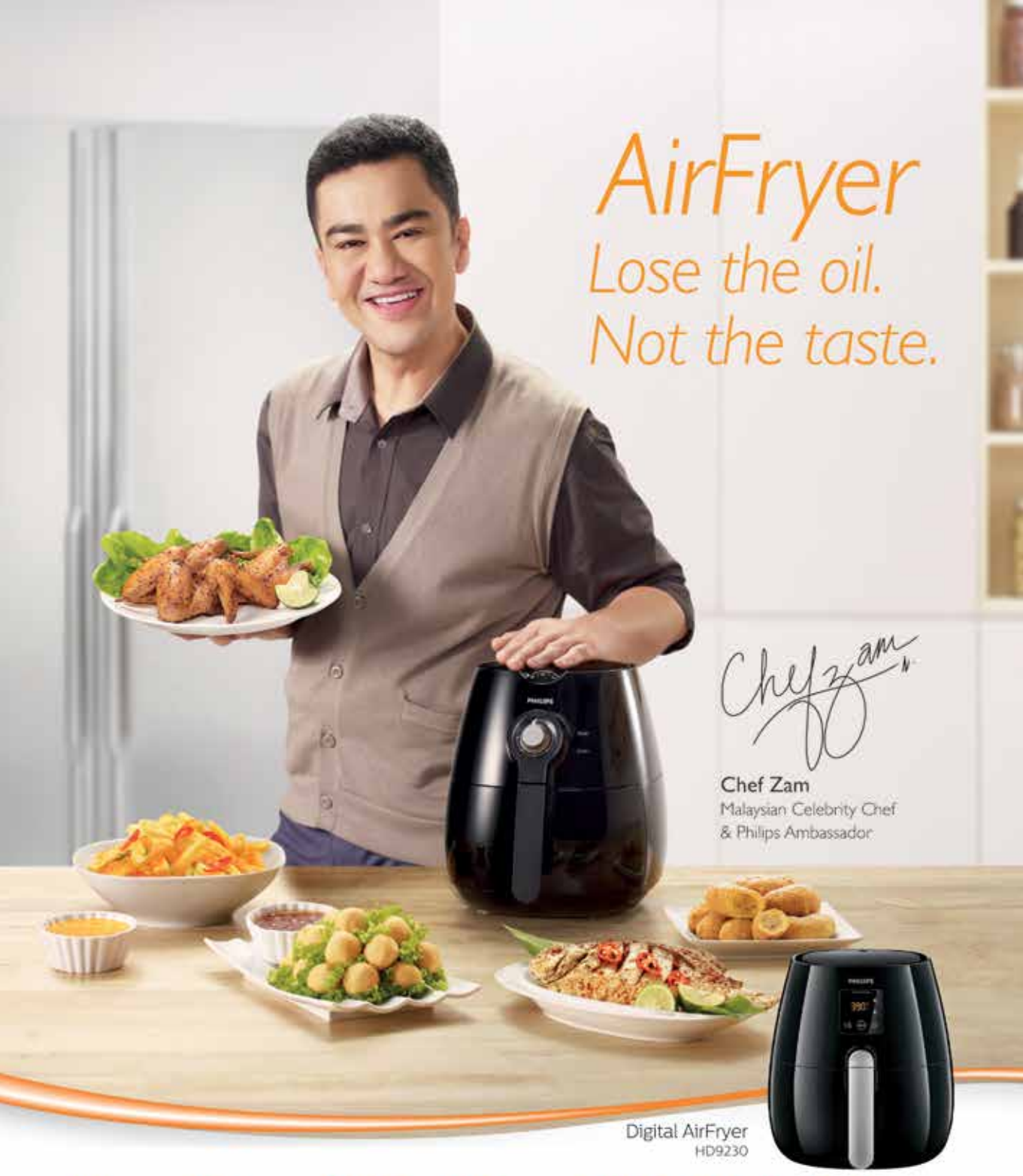

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Abstracts

Day 1

Symposium 1: Improving Lives Through Public Health Nutrition

Southeast Asia Public Health Nutrition (SEA-PHN) Network – promoting regional collaboration for community nutrition improvement

Tee ES

Chairman, Southeast Asia Public Health Nutrition Network

Countries in the Southeast Asia region have undergone rapid socio-economic transition over the past several decades. These developments have resulted in significant changes to the lifestyle of communities, including food consumption patterns. It also resulted in marked changes to the nutrition scene such as a decline in nutrient deficiencies and a rise in the prevalence of diet-related chronic diseases (NCDs) among the population in the region. Governments have re-aligned food and nutrition policies and came up with action plans to address the nutrition problems. Public health nutrition measures should remain as the key approaches.

Public health nutrition focuses on the application of food and nutrition knowledge, policy and research for the primary prevention of nutrition related disorder and the improvement of the health of the population. Nutrition societies/associations in Southeast Asia can play greater roles in supporting government agencies, while the private sector can contribute their expertise as well as resources in this field. Collaboration among these key stakeholders should be encouraged for more effective implementation of public health nutrition measures.

Recognising this potential role of nutrition societies in the region, the Southeast Asia Public Health Nutrition network (SEA-PHN) network was established on June 2, 2014. The Network is a partnership of nutrition societies in the Southeast Asia region, government ministries and private agencies dedicated to researching, applying and promoting public health nutrition among the population in efforts to alleviate the nutrition problems in the region. The Network aims to establish and maintain an interactive network among nutritionists in the region, promoting periodic exchange of experiences and activities in all public health nutrition issues, including nutrient deficiencies and diet-related chronic diseases. The Network encourages collaboration among professional bodies, government agencies and private sector in conducting community nutrition improvement programmes, in the spirit of public-private partnership.

Members of the Network shall comprise the nutrition society of each country in the Southeast Asia region. Five societies have confirmed their participation, and these are affiliated to the Federation of Asian Nutrition Societies (FANS), namely:

- Food and Nutrition Society of Indonesia (Pergizi Pangan Indonesia)
- Nutrition Society of Malaysia (NSM)
- Nutrition Foundation of the Philippines, Inc.
- Nutrition Association of Thailand (NAT)
- Vietnam Nutrition Association (Vinutas)

These members attended the first meeting of this Network on 2 June 2014. Associate members who also attended the inaugural meeting include 6 corporate companies as well as nutrition officials from departments of health in Southeast Asian countries. The meeting discussed the main food and nutrition issues and activities in the member countries. All participants at the meeting also discussed potential collaboration programmes for promotion of public health nutrition.

This presentation provides highlights of the establishment of the SEA-PHN Network and the main discussions of Network members during its inaugural meeting. This historical development signals the establishment of closer collaboration of Nutrition Societies/ Associations and their members in the Southeast Asia region in public health nutrition matters.

MyBreakfast Study: Breakfast habits of Malaysian primary and secondary school children

Tee ES[1], Norimah AK[2], Mohd Nasir MT[3], Appukutty M[4], Hamid Jan JM[5], Tan SY[6], Thielecke F[7], Hopkins S[7], Ong MK[8] and Ning C[8]

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MyBreakfast study is a nationwide cross-sectional study conducted by the Nutrition Society of Malaysia, aimed to determine socio-demographic background, BMI status, physical activity level, breakfast habits and the types of foods and beverages consumed at breakfast with an emphasis on fortified foods including whole grains, ready-to-eat cereals (RTEC) and fortified beverages among primary and secondary school children aged 6 to 17 years (M=10.9, SD=2.9) in Malaysia (N=8705; m=4039, f=4666). Data collection was conducted in five regions in Malaysia, including Central (n=1791), Southern (n=1729), Northern (n=2177), East Coast (n=1453) and East Malaysia (n=1555). By using multistage sampling, schools in both urban and rural area of each state of the regions were randomly selected. Socio-demographic background was obtained from parents through a questionnaire. For children aged 6 to 9 years, a breakfast habits questionnaire (BHQ), food frequency questionnaire (FFQ), two food record forms (one for a weekday and one for a weekend) and physical activity questionnaire were self-administered by parents. For children aged 10 years and above, the BHQ, FFQ, physical activity questionnaire and a two-day 24-hour dietary recall were administered by interview in school. Data collection was conducted for two days, one to obtain dietary intakes on a weekday and one to obtain dietary intakes on a weekend. Height and weight of all the children were measured; BMI-for-age, height-for-age and weight-for-age were determined.

The proportion of children recruited from the urban and rural area was 68.4% and 31.6% respectively. The percentage of children aged 6 to 9 years, 10 to 12 years, 13 to 15 years and 16 to 17 years who participated in the study was 36.6%, 27.5%, 28.1% and 7.8% respectively. There were 61.1% Malays, 18.6% Chinese, 8.2% Indian, 11.3% Bumiputera Sabah/Sarawak and 0.7% children of other ethnicities. Majority of the fathers (58.1%) and mothers (60.1%) attained secondary education. Thirty-five percent of the parents had monthly household income of less than RM1500 (low household income), while 28.7% had an income of between RM1500 to RM3500. (moderate household income)

The mean intake of breakfast per week was 5.6 days (*SD*=2.0). The prevalence of children who skipped breakfast more than two days a week was 11.9%. Skipping breakfast was found to be higher among girls (13.1%) compared to boys (10.6%), and among children in the age-group of 16 to 17 years (17.9%) than children in the aged-group of 13 to 15 (15.7%), 10 to 12 (13.1%) and 6 to 9 years (6.8%). Most of the children took breakfast at home (88.4%). Bread (31.6%), *nasi lemak* (20.5%) and fried rice (12.1%) were the most common breakfast foods. Most of the children took malted drink (52.3%) at breakfast. The percentage of children who consumed ready-to-eat breakfast cereal (RTEBC) or hot cereal at breakfast more than two days a week was 25.9% and 14.3% respectively.

This is the first detailed nationwide survey on breakfast habits that involves a large number of both primary and secondary school children, randomly sampled from all parts of Malaysia. This study also measures whole grain intakes of the children. These preliminary findings only provide descriptive results on socio-demographic background and breakfast habits among the children as the study has just being completed. Further analyses are currently being conducted to determine whole grain intakes of the children, the contribution of breakfast towards energy and nutrients intake, and the association between physical activity, body weight status and breakfast consumption among the children. Besides breakfast habits, the study also determined the dietary intake of these children through a two-day 24-hour dietary recall. Nutrient adequacy of these children shall be determined in relation to socio-economic, BMI status and physical activity level.

(Carried out with a research grant from Cereal Partners Worldwide and Nestle)

Nutritional status of children aged 6 months to 12 years: Results from SEANUTS Malaysia

***Poh BK*, Nik Shanita S, Wong JE, Ruzita AT and Norimah AK**

School of Healthcare Sciences, Faculty of Health Sciences, Universiti Kebangsaan Malaysia, 50300 Kuala Lumpur

Previous studies have reported dual burden of malnutrition among Malaysian children; however, comprehensive data relating to various aspects of nutrition are scarce. Hence, the Nutrition Survey of Malaysian Children was conducted to assess the nutritional status of a sample of nationally representative population of children aged from 6 months to 12 years. This survey is part of the South East Asian Nutrition Surveys (SEANUTS) involving 16,744 children in four countries in South East Asia. In Malaysia, a total of 3,542 children were recruited using stratified random sampling. Anthropometric measurements included weight, height, mid-upper arm circumference, and waist and hip circumferences. Blood biochemical assessment involved analyses of Hb, serum ferritin, and vitamins A and D. Dietary intake was assessed using semi-quantitative FFQ, and nutrient intakes were compared with the Malaysian Recommended Nutrient Intakes (RNI). Physical activity was assessed using validated questionnaires and in a subsample pedometers were worn for seven days. Bone health status was measured with quantitative ultrasound technique. Cognitive development was assessed with Ages and Stages Questionnaire among children below 4 years, and Ravens Progressive Matrices in older children. Prevalence of overweight (9·8 %) and obesity (11·8 %) was higher than that of thinness (5·4 %) and stunting (8·4 %). Only a small proportion of children had low levels of Hb (6·6 %), serum ferritin (4·4 %) and vitamin A (4·4 %), but almost half the children (47·5 %) had vitamin D insufficiency. Dietary intake of the children was not compatible with recommendations, where more than one-third did not achieve the Malaysian RNI for energy, Ca and vitamin D. The majority of children had low physical activity levels, and only less than 10% of children met pedometer step recommendations. The majority of children had average non-verbal IQ,

with only 16.5% at superior level, and 10.1% low or borderline IQ category. Children with poorer nutrition are at higher odds of having below average non-verbal IQ. We conclude that overnutrition is a bigger public health problem than undernutrition; and that the high prevalence of vitamin D insufficiency and inadequate intake of calcium and vitamin D is a matter of concern. The association between both under- and over-nutrition with below average cognition, coupled with low levels of physical activity are also of grave concern. We call upon the government and other stakeholders to work together and plan multi-partner collaborative strategies that can take control of these issues pertaining to the improvement our children's nutritional status, health and well-being.

Public Health Nutrition Issues and Interventions in Indonesia

Hardinsyah MS

Food and Nutrition Society of Indonesia

To be provided later

Symposium 2: Improving Lives Through Public Health Nutrition

Public health nutrition issues and interventions in the Philippines

Florentino RF

Nutrition Foundation of the Philippines, Inc.

Since 1974, the Philippines has been deep into the promotion of nutrition of the population, yet important issues remain that are the object of public health nutrition strategies. One is the slow decline of underweight and stunting in the young. Iron deficiency anemia continues to plague young children and pregnant women. Vitamin A deficiency among pregnant women remains high. The poor health and nutrition support during the first 1000 days of life is shown by the still high rate of infant mortality and low birth weight. On the other hand, overweight and obesity among adults is on the rise, and to a smaller extent among children. Finally, the high incidence of hunger, food insecurity and poverty remain among a large segment of the population These, in spite of glowing macro-economic indicators and unprecedented rise in GDP in recent years. The government's response to these issues is embodied in the Philippine Plan of Action for Nutrition. Among the strategies in the current plan includes: promotion of optimum infant and young child feeding practices; integration and strengthening of nutrition services in ante-natal, post-natal and child care including supplementary feeding; and increasing the consumption of micronutrients through micronutrient supplementation and food fortification. Two broad programs have recently been put place: the Accelerated Hunger Mitigation Program and the Conditional Cash Transfer Program. In addition, numerous smaller scale programs are being carried out by NGOs and the private sector. While recent national data show significant drop in the incidence of poverty and in those who consider themselves poor, challenges remain in the implementation of nutrition improvement programs which have to be met if the national nutrition goals are to be achieved.

Public health nutrition issues and activities in Thailand

***Umaporn S*[1,3] *and Napaphan V*[2,3]**

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[2]*Bureau of Nutrition, Department of Health, Ministry of Public Health, Thailand;*
[3]*Nutrition Association of Thailand under the Patronage of Her Royal Highness Princess Maha Chakri Sirindhorn*

During the last 20 years, Thailand has become a middle-income developing country with an ageing population and urbanization. The successful multisectoral policies and programs for poverty alleviation and primary health care as well as the effective community-based nutrition programs implemented during the 1980s to mid-1990s markedly reduced proteinenergy malnutrition and micronutrient deficiencies among children and women. On the contrary, the prevalences of overweight, obesity, and non-communicable diseases (NCDs) are rising during the past two decades due to lifestyle changes and inadequate nutritional knowledge among consumers. There has been increasing consumption of sugar and fatty foods, reducing intakes of fruits and vegetables, and inadequate physical activity and exercise. Thailand, like many developing countries, is therefore facing the double burden of malnutrition, wherein undernutrition and overnutrition coexist.

NCDs, which are mainly due to lifestyle changes, are the priority public health problems for Thailand. The National Economic and Social Development Board (NESDB) along with related ministries and organizations, such as the Ministry of Agriculture and Commodities (MOAC), Ministry of Public Health (MOPH), and Ministry of Commerce (MOC) developed the "Thailand Healthy Lifestyle Strategic Plan 2011-2020". The Plan aims to reduce problems from 5 NCDs, namely diabetes, hypertension, heart disease, cerebrovascular disease, and cancers by promoting 3 components of sufficiency lifestyle, i.e. balance diet, adequate physical exercise, and suitable emotion management. This strategic plan also included HM the King's Sufficiency Economy Philosophy, which emphasizes local food production for household food and nutrition security, with only surpluses being sold.

The National Health Commission under the National Health Act (2007) is another national mechanism focusing on public policy regarding major health problems. The Commission brought the issue of overweight and obesity to the National Health Assembly in 2010. The aims were to raise public awareness, to promote appropriate behaviors, and to strengthen the health monitoring and surveillance system. Action plans are promotion of breastfeeding and healthy diets, control of food marketing for children, raising public awareness about the risks of obesity and overweight, promoting physical activities, strengthening health services and programs to mitigate problems associated with overweight and obesity, and strengthening an overall system to address and monitor obesity and overweight, as well as a system to evaluate related programs. The action plans requested for urgent implementation included traffic light Guideline Daily Amounts (GDAs), applying tax and price policies to unhealthy foods, and controlling the marketing of energy-dense and unhealthy foods targeted at children. The proposed action plans created social awareness, but they have yet to be fully implemented.

The Bureau of Nutrition, MOPH (2010-2013), has developed the most recent national nutrition policy and programs. The policy clearly mentions three nutritional challenges, namely obesity prevention, iodine deficiency disorders (IDD) prevention and monitoring, and optimum nutrition of Thai children. Concepts for campaigns and promotions are designed to fit with new lifestyles, while also promoting the benefits of traditional Thai dishes. Micronutrient fortification and food diversification will be implemented in addition to the continuing programs e.g. universal iodized salt and fish sauce fortification. Simultaneously, the advocacy on food and nutrition for health promotion will be conducted,

namely food and nutrition for the prevention and management of chronic diseases according to the WHO recommendation, food and nutrition for health promotion, and food security and safety. Along with these advocacy programs, research and development are planned.

Many organizations are involved in implementing food and nutrition activities in the country under the National Food Committee (NFC). Within this context, the Strategic Framework for Food Management (SFFM) is being implemented by three committees namely, (i) food security, (ii) food quality and safety, and (iii) linking food, nutrition and health. The NFC and these three implementing committees, along with related task forces and working groups, have involved all related stakeholders from different disciplines and professionals to work together harmoniously on the SFFM.

Public health nutrition issues and interventions in Vietnam

Le Thi Hop

Vietnam Nutrition Association, National Institute of Nutrition, Vietnam

The results of the Vietnam General Nutrition Survey in 2010 showed that the nutritional status of the population has been remarkably improved comprared to the last decades; however, it started facing with the double burden of malnutrition. In 2010, the prevalence of underweight among preschool children was 17.5%, stunting was 29.3% of children under 5 years old. The prevalence of wasting among children under five was 7.1% at national level. There is a variation among ecological regions, and stunting is highest in poor regions (the Central Highland and Northern Mountainous area). Besides, the rate of obesity among children under 5 years of age was about 4.8%. The current rate is 6 times higher than that in the year of 2000. The prevalence of women at reproductive age with low Body Mass Index (BMI <18.5) was 18%. Meanwhile, the proportion of reproductive aged women with BMI≥ 25 was 8.2% (overweight and obesity). The percentage of anemia of <5 children was 29,2% and among pregnant women was 36,5%. The national level of vitamin A deficiency (<0,7 μmol/L) among <5 children was 14,2%; and the prevelance of low vitamin A in breat milk (<1,05 μmol/L) was about 35,0%. The percentage of Zinc deficiency was high in both children and reproductive aged women.

The results of the General Nutrition Survey 2010 also shown that the diet of Vietnamese people has remarkably changed: Reducing in some food groups: rice, potato and tubers, sauce; increasing in some other groups: animal source foods (especially meat), fat and oil, beans and several other food groups. Food intake is more balanced in terms of quality; little changes in some food groups: fish, aqua-products, peanut, and sesame, vegetables; mean energy intake of Vietnamese people reaches 1,925 Kcal/capital/day in 2010. Animal protein intake is accounted for 38.5%. Energy derives from dietary lipid increases from 12% in 2000 to 17.6% in 2010. Food intake is more balanced (P: L: G = 15.4:17.6:67) in 2010.

The nutrition chellenges: Beside the double burden of malnutrition, Food safety has been an alarming issue for recent years even though the Government has made many efforts to deal with, both institutional and legal. The numbers of toxicity cases are reportedly increasing. Violation of food laws is common. With the open market and the influence of food “fashion”, the concept of fast food and many types of fast foods (both western and local) have been introduced and welcome by the people, especially those live in cities and the youths. This trend has led to the increase of obesity and non-communicable diseases as it has been observed recently all over the country. The culture of drinking has made alcoholic drink consumption is on the rise. Vietnam has been ranked as one of the highest consumer of alcoholic drinks in the region (by average intake per capita). This would lead to many social and health problems that the society and health sectors will have to face.

As a professional association, Vietnam Nutrition Association (VINUTAS) with its mandates have been contributed to the effective implementation of the National Nutrition Strategy 2011 – 2020, the NPAN 2013-2020 with different project/programs and National Malnutrition Control Program, which are focusing on addressing the mentioned nutritional issues of the country. To do this, VINUTAS promotes nutrition education and communication via the dissemination of Food-based Dietary Guidelines and Food Pyramid for the new period.

Public health nutrition issues and interventions in Malaysia

Mohd Ismail N

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Malaysia has been blessed with a sustained economic growth and political stability over the last three decades. Unfortunately, the rapid transition has generated marked changes in dietary habits and lifestyle which in turn is reflected by an increased in morbidity and mortality of the population. The double burden disease theory is still apparent; i.e. while great efforts are being made to combat communicable diseases and pockets of malnutrition, the past decades has seen an unprecedented rise in non-communicable diseases namely diabetes, coronary heart disease, hypertension and obesity.

Recognizing the existence of these nutrition-related disorders, the National Nutrition Policy (2005) and the National Plans of Action for Nutrition (NPAN) of Malaysia (1996-2000; 2006-2015) have been appropriately reviewed to give attention to the promotion of healthy diets and active living for the promotion of optimal nutrition among Malaysians. The introduction of National Strategic Plan for Non-Communicable Diseases (2010) provides further impetus to arrest the upward trend of NCDs.

This paper will focus and highlight the contribution of the Nutrition Society of Malaysia in alleviating the nutrition problems since it's establishment in 1984. NSM have played a pivotal role in most if not all nutrition-related activities in the country through collaboration with several Ministries and Government agencies in particular, the Ministry of Health Malaysia, several professional bodies and food industry. The role of local Universities in churning out useful data for policy makers through their research activities will also be highlighted.

It is envisage that NSM will continue to implement intervention programmes in the future to help empower the people with the knowledge of healthy eating and active living. We will strive to complement the government's vision and effort of a healthier nation, and healthier Malaysians. We look forward to further strengthen collaborations and partnership with all stakeholders, including various government agencies and the food industry, in achieving these objectives. The need to know more of what Malaysians are eating that have direct relevance to the health status have been a perennial issue that need to be address. It is a challenge for our young researchers in the Universities and Research Institutes to make it their priority to apply the numerous grants available from MOE and MOSTI to continue providing useful data to make Nutrition relevant in this country.

Symposium 3: Young Researcher's Symposium

Association between body image perception and overweight and obesity among Malaysian adolescents staying in boarding schools

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Misperceptions of body image are predictors of overweight and obesity. This study aimed to determine the associations between weight status perception, healthy body size perception, body size satisfaction and overweight and obesity among Malaysian adolescents staying in 100 boarding schools. This study involved 3858 boarding schools adolescents aged 13.0 ± 0.3 years. Body weight and height were measured, and body weight status (BMI-for-age) was determined based on WHO Growth Reference. Adolescents completed Contour Drawing Rating Scale (CDRS) and items on weight perception assessed their perception of body weight and size. About one in four (total=23.9%, male=22.5%, female=24.7%; x^2=2.439, p>0.05) adolescents were overweight and obese. Half of the adolescents (total=51.4%, male=53.9%, female=49.8%; x^2= 6.234, p<0.05) perceived their weight status incorrectly and one-third of them (total=33.7%, male=11.2%, female=48.2%; x^2=562.042, p<0.001) perceived healthy body size incorrectly. Besides, about three in four adolescents (total=70.8%, male=66.3%, female=73.6%; x^2=24.039, p<0.001) dissatisfied with their body size. The prevalence of overweight and obesity was higher in adolescents with body weight misperception (x^2=215.710, p<0.001) and body size dissatisfaction (x^2=109.934, p<0.001). No significant association was found between healthy body size misperception and overweight and obesity. Based on binary logistic regression, adolescents with body weight misperception and body size dissatisfaction were 3.154 times (95% CI: 2.677, 3.715) and 2.616 times (95% CI: 2.146, 3.188) more likely to be overweight and obese, respectively. In addition, for both males and females, body weight misperception (male: OR=5.380, 95% CI: 3.917, 7.287; female: OR=2.449, 95% CI: 2006, 2.989) and body size dissatisfaction (male: OR=2.191, 95% CI: 1.622, 2.960; female: OR=2.930, 95% CI: 2.243, 3.828) were risk factors of overweight and obesity. In short, intervention programme is needed to overcome the high prevalence of overweight and obesity. Promoting positive body image should be intergrated in the intervention programme by correcting weight perception and improving body satisfaction of the adolescents.

Obesity and metabolic health: are they associated with cognitive function in healthy young adolescents?

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Evidence points to the fact that obesity and impaired metabolic health impact negatively on the cognitive function of adults. This hypothesis, however, has not been extensively tested in the younger population. Hence, the present study aimed to examine the associations

of obesity and metabolic health with cognitive function among young adolescents. A total of 257 young Malay adolescents (121 boys; 136 girls) aged 10 to 14 years were recruited from primary and secondary schools in Kuala Lumpur using multistage sampling method. Anthropometric measurements included weight, height and waist circumference (WC); body fat (BF) was assessed by bioelectrical impedance analysis. Blood pressure (BP) was measured and fasting blood sample was collected for analysis of insulin, lipid and glucose profiles. Cognitive function was assessed using four non-verbal sub-scales of Wechsler Intelligence Scale for Children. About 30% of subjects were overweight or obese, with 34.7% among boys and 25.8% in girls. Some 27.6% of subjects had at least one risk factor for metabolic syndrome. Insulin resistance was found in 13.2% of subjects. After adjusting for sex, obese subjects had lower total cognitive test scores (TS) compared to their normal-weight counterparts ($p<0.05$). Cognitive TS was significantly lower in subjects whose BF% was in the highest quartile than those in lowest quartile ($p<0.05$); and in those with insulin resistance compared with those without ($p<0.05$). However, TS did not differ significantly between subjects who had no risk factors of metabolic syndrome and those with one to three risk factors. In a stepwise multivariate analysis, only sex ($\beta=0.16$, $p<0.01$) and fasting insulin level ($\beta=-0.15$, $p<0.05$) were found to be associated with cognitive TS. These findings suggest that cognitive function may be impacted in obese young adolescents with impaired metabolic health, particularly among those with insulin resistance. Further studies are warranted in order to better understand the underlying mechanisms.

Development and validation of Knowledge, Attitude and Practice on Healthy Lifestyle Questionnaire (KAP-HLQ) for Malaysian adolescents staying in school hostels

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Instruments to assess knowledge, attitude and practice (KAP) on healthy lifestyle of adolescents are scarce. This cross-sectional study aims to develop and determine the validity and reliability of the Knowledge, Attitude and Practice on Healthy Lifestyle Questionnaire (KAP-HLQ) among Malaysian adolescents in secondary school hostels. A total of 647 lower secondary school students from 12 school hostels in Malaysia participated in the study. The items in the knowledge (56 items), attitude (62 items) and practice (60 items) sections of the KAP-HLQ were developed mainly based on the Healthy Eating and Active Living (HEBAT) module under the Healthy Lifestyle Programme. For content validity, an expert panel eliminated 13 items in the knowledge section and one item each from attitude and practice sections of the KAP-HLQ due to inappropriateness of the items. One knowledge item, two attitude and practice items each were further removed in the process of item analysis due to low discrimination index. Construct validity through exploratory factor analysis identified four dimensions (27 items) in the attitude section and six dimensions (28 items) in the practice section of the KAP-HLQ. Convergent validity was determined by correlating knowledge and attitude ($r=0.260$, $p<0.05$), knowledge and practice ($r=0.201$, $p<0.05$), and attitude and practice ($r=0.517$, $p<0.05$) of the KAP-HLQ. Internal consistency coefficients of the knowledge, attitude and practice sections were 0.654, 0.845 and 0.636 respectively, indicating that it is a reliable tool. Test-retest reliability of the KAP-HLQ was determined among a subset of adolescents ($n=118$) at two time points with an interval of two weeks (knowledge: $r=0.631$, $p<0.05$; attitude: $r=0.358$, $p<0.05$; practice: $r=0.481$, $p<0.05$). With adequate validity and reliability, the KAP-HLQ (knowledge: 42 items; attitude: 27 items; practice: 28 items) can be used to assess KAP on healthy lifestyle of the target group.

The association between metabolic syndrome risk factors and high-molecular-weight adiponectin among the endangered Orang Asli population in Malaysia

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Orang Asli or aborigine is the indigenous peoples of Peninsular Malaysia. Overall, there are 18 tribes and the Che Wong, Kensiu, Lanoh, Semai, and Orang Kanaq were classified as endangered tribes by the authority. Health research among these tribes is also limited. Hence, this study was aimed to investigate the associations of metabolic syndrome (MetS) risk factors and high molecular weight (HMW) adiponectin among the endangered Orang Asli population in Peninsular Malaysia. This cross sectional study was conducted according to the tribe's geographical location among Orang Asli population in Malaysia. A total of 160 respondents, aged 18 to 70 years, were recruited using convenience and snow-ball sampling methods from year 2011 to 2013. The respondents underwent anthropometric measurements such as weight, height, waist circumference and blood pressure. Fasting venous blood samples were analyzed for lipid profile, plasma glucose and HMW adiponectin concentrations. The overall prevalence of MetS was 16.9%, with a noticeable higher percentage of MetS for women at 88.9%, compared to men at 11.1%. Multiple linear regression models revealed that HMW adiponectin was positively associated with HDL-C (β=0.27; P=0.010), but negatively associated with triglycerides (β=-0.48; P=0.012) and waist circumference (β=-10.94; P<0.001), independently from age and sex. Multiple logistic regression models indicated that HMW adiponectin was significantly associated with reduced risk of MetS only in women (OR=0.59; p=0.042), after controlling for age. In conclusion, our findings suggest that the prevalence of MetS among female Orang Asli is high and it is associated with HMW adiponectin level.

Physical activity and sleeping duration attenuates the effect of FTO but not MC4R on body mass index and eating behaviour in Malay children

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Fat mass and obesity-associated (FTO) and melanocortin-4 receptor (MC4R) genes are associated with obesity; however, its association with eating behaviour is still contradictory and its modulation by physical activity remains a question. Thus, we investigated the interaction between FTO rs9939609 and MC4R rs17782313 with physical activity and sleep duration on body mass index (BMI) and eating behaviour among Malay children. A total of 1,095 school children aged 6-12 years were recruited in metropolitan Kuala Lumpur. DNA was genotyped using semi-automated Sequenom iPLEX® Gold assay. Body weight and height were measured, and BMI was categorized using WHO 2007 growth reference. Eating

behavior was assessed by validated Children's Eating Behavior Questionnaire (CEBQ). Physical activity was objectively measured by pedometer for seven days, while sleep duration was self-reported through questionnaire. Both A-allele of FTO rs9939609 and C-allele of MC4R rs17782313 were associated with increased obesity risk with odds ratio (OR) of 1.52 to 2.87 ($p<0.05$) after adjusting for sex and age. A-allele for rs9939609 was shown to associate with decreased satiety responsiveness (B: -0.087, 95%CI: -0.155,-0.019, $p<0.05$); however, no significant association of rs17782313 was shown with CEBQ score. Significant interaction was found between genotype of FTO rs9939609 with pedometer step counts ($p<0.001$) as well as with sleep duration ($p<0.001$). But, similar interactions were not found for MC4R rs17782313. We also found that FTO rs9939609 polymorphisms were significantly associated with increased BMI (Chi-square=19.44, $p=0.001$). Nonetheless, this association was reduced among AA homozygotes who met pedometer step-count recommendation (Chi-square=4.85, $p=0.088$) and those whose sleep duration was more than 9 hours (Chi-square=0.026, $p=0.987$). Thus, the additive effect of minor allele FTO rs9939609 on reduced satiety responses score was only evident among subjects who did not meet pedometer recommendations ($p<0.05$) and those who slept 8-9 hours ($p<0.05$). Our findings are in line with previous studies that both minor alleles of FTO rs9939609 and MC4R rs17782313 were associated with increased obesity risk. The effect of the FTO rs9939609 polymorphisms on BMI may be attenuated by increasing physical activity and sleep duration perhaps through enhanced satiety responses. However, physical activity and sleep did not modify the effect of MC4R on obesity in the Malay childhood population.

Day 2

Symposium 4: Industry Contributions to Promoting Public Health Nutrition

PepsiCo's Public Health Nutrition Initiatives

Harjani YH

Pepsico Asia Pacific Region

PepsiCo is a global food and beverage company that comprises 22 brands that include not just PepsiCo's iconic beverages and snacks, such as Pepsi-Cola, Mountain Dew, 7UP, as well as, Lay's, Doritos and Cheetos, but also nutrition brands such as Quaker, Tropicana and Gatorade. PepsiCo is guided by Performance with Purpose, and PepsiCo's goal is to deliver sustained value by providing a wide range of beverages and foods from treats to healthy eats. In terms of healthy eats, PepsiCo is focused on providing new offerings that meet consumer needs for both nutrition as well as convenience. PepsiCo not only has a wide range of Good-For-You Quaker products, 100% Tropicana juice, and sports drinks; but it is also expanding its Better-For-You choices by reducing sugar, salt, and saturated fat in beverages and foods, without sacrificing taste. Additionally, there is continued effort to provide clear nutrition information on most products, and sell and market them appropriately to consumers, including children, in line with global policies and accepted global standards. PepsiCo's efforts go beyond the business, and PepsiCo supports many health promotion initiatives both globally and locally.

Nestlé Public Health Nutrition Activities

Cher SW

Nestlé (Malaysia) Berhad

At Nestlé, we are playing an active role in helping to address over-nutrition, under-nutrition and related micronutrient deficiencies, obesity and non-communicable diseases – pressing issues that affect billions of people around the world.

The Nestlé Public Health Nutrition Network is establish with a mission to drive Nestle's ambition of being the leading Nutrition, Health and Wellness Company by guiding our business partners through the translation of nutrition knowledge to improve the reality of our products, information and services. The Nestlé Public Health Nutrition Network focuses on four (4) competence pillars, namely Nutrition Knowledge Leadership, Nutrition Evaluation, Nutrient profiling and Health economics. The Nutrition Knowledge Leadership objective is to gain science-based knowledge on specific nutritional issues in different countries via dietary intake research and tailor-made tools, called Nutrition Landscaping.

Based on specific requests from businesses and the R&D community, we scientifically assess the health effects related to specific food and nutrients through evidence-based criteria. Scientific evaluation results in actionable recommendations to address nutritional 'hot' topics that are relevant to our consumers. Nutrient profiling is the science of classifying or ranking foods according to their nutritional composition for health-related products. It is developed based on public health recommendations, nutrition science as well as technical and sensorial considerations.

Health economics is the science that translates health benefits into economic benefits. This research predicts the costs of a disease and a health intervention to inform the choice of the most effective and efficient nutrition intervention for the biggest impact on outcomes at the lowest cost.

Effect of fortified milk with FOS-Inulin on bone biomarkers.

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The study objective is to compare the effects of a high calcium vitamin D fortified milk with added FOS-Inulin versus regular milk on serum parathyroid hormone (PTH), and bone turnover markers in premenopausal (PreM) and postmenopausal (PM) women over one year, with a preliminary marker assessment at 3 months. Postmenopausal women (n = 125, mean age 59 (±4) years) and premenopausal women (n = 137, mean age 41 (±5) years) were recruited, and each age group randomized into two groups: control = regular milk (500mg calcium) or test=fortified milk (1000mg calcium for preM women and 1200mg calcium for PM women, plus 96 mg magnesium, 2.4mg zinc, 15µg vitamin D and 4g FOS-Inulin) per day. Baseline body mass index (BMI) was 22.6 for PreM and 23.8 for the PM women. Mean bone densities for the PreM women were 1.21 (lumbar spine) and 0.95g/ cm^2 (hip), and 1.04 (lumbar spine) and 0.89g/cm^2 (hip) for the PM women. None of the women were osteoporotic. Mean dietary calcium intake assessed by Food Frequency Questionnaire ranged from 300-400mg/day. Mean vitamin D levels among groups were between 55 and 62nmol/L at baseline. Over the 12 weeks of supplementation, mean vitamin D levels increased between 9 and 13 nmol/L in PreM women, while vitamin D levels were lower in the PM control versus PM test group (53 vs 62nmol/L). Bone turnover markers C-telopeptide of type I collagen (CTx-1) and PINP reduced significantly in both PreM and PM groups over the 12 weeks, with CTx levels being significantly different ($P<0.002$) between PM control and PM test groups at week 12. Parathyroid hormone levels were significantly reduced in all groups over time. These preliminary results indicate that while both regular milk and fortified milk reduce bone resorption in young and older women, fortified milk is measurably more effective.

The contribution of inulin type prebiotic fibres and the slow release carbohydrate Palatinose™ to a healthier, prevention-oriented diet

Sentko A

Regulatory Affairs, Nutrition Communication; BENEO-Institute

BENEO's way of contributing to public health nutrition is by offering functional carbohydrates and fibres to food manufacturers that support healthy nutrition and healthy ageing from early on. Extensive research, related to the physiological characteristics of our ingredients and their benefits, is key to be part of the solution. BENEO's functional ingredients are carbohydrates. Carbohydrates deliver more than 50% of the daily caloric

intake. This means, smart choices of carbohydrate-type ingredients have a strong influence to overall metabolism and health. To give some examples:

Palatinose™ (isomaltulose) is a smart choice to replace traditional high glycaemic sugars or starches. It is more slowly digested, yet still fully available, enabling sustained energy delivery and leading to a lower blood glucose and insulin profile. Fat oxidation is improved, visceral fat accumulation can be influenced and insulin sensitivity improved. The right choice of food, with smart ingredients, can positively influence overall health.

Inulin-type fructans from chicory (inulin, oligofructose (FOS)) are dietary fibres, extracted from the chicory root. Enzymes in the gastrointestinal tract cannot digest these carbohydrates. Therefore, this chicory fibre is classified as a non-available carbohydrate, fermented in the large intestine. This process leads to valuable break down products, i.e. short chain fatty acids and gases, which positively influence the gut environment, faeces consistency and the frequency of bowel movements. They also lead to a selective growth of the gut bacteria that produce vitamins and SCFA, without producing toxins. Inulin-type fructans are prebiotics. They contribute to a lower rise in blood sugar if used as replacement for high-glycaemic carbohydrates or as supplements. Calcium absorption is improved, an important aspect in the prevention of osteoporosis.

Particular attention will be given to the improvement of calcium absorption by inulin-type fructans, in particular by a dedicated mixture of long- and short-chain fructans (Orafti™Synergy1). For this ingredient, not only the improvement of the bioavailability of the dietary calcium was demonstrated. It was also proven, that this increase in calcium reaches the bones (higher bone mineral content and density) and thus makes bones stronger. Worldwide, at least one in three women and one in five men older than 50 will suffer from fractures caused by week bones according to the International Osteoporosis Foundation.

Overall, it is obvious that with the beneficial physiological characteristics described above, diet related challenges like overweight, impaired insulin sensitivity, diabetes or osteoporosis can be addressed. A healthy, prevention oriented diet is supported that may delay the onset of NCDs or may help to avoid them overall.

Tools in form of science based ingredients are available to contribute to a healthier and still tasteful and enjoyable nutrition. Food manufacturers developed products already and are ready to continue. BENEO will provide support by sharing the science and providing technical application services as well. Explaining the science behind our ingredients to health care professionals is another pillar in BENEO's approach to healthy nutrition.

Consumers need to identify those foods that have the added values easily. Language towards the consumer needs to be clear and attractive so that consumers can find the healthy choices.

Symposium 5a: Nutrition Potpourri

The Relationship between Nutritional Habits and Internet Addiction among University Students in Kuala Lumpur, Malaysia.

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Internet addiction nowadays is one of the new challenges especially for young adults. The consequences of such addiction can be mentally and physically. The objective of this study

was to assess the nutritional habits among internet users in Kuala Lumpur, Malaysia. A survey was done among 361 private university students in Kuala Lumpur, Malaysia. A self- administered modifiable questionnaires were used to assess food habits among respondents and pre-test was done. Body Mass Index (BMI) was used to determine the weight status of the respondents. The results showed that majority of the respondents were female (65.1 %) almost two-thirds were underweight (68.1%) and mean age was 21 years old. A total of (82.3%) eat dinner daily, (52.1%) eat outside the house daily. Consumption of fruits was not good as 56.0% eat once a week. A total of 37.7% spent more than 4 hours per day on PC, iPad or tablet, while 30.8% spent 1-2 hours daily on Facebook. A total of 54.3% admitted that they ate while using internet and also 59.3% played with their phones while eating. The association between BMI and sex, number of water glasses, fruits serving, carbonated drinks drinking while using the internet and eating while using the internet were significant ($p<0.001$, 0.012, 0.024, 0.038,0.040) respectively. As a conclusion,Weight status among the respondents was not good as majority tend to be underweight. The possible reason for this may be the long duration they spent on internet and facebook daily, lack of fruits and vegetables consumption, eating outside daily and also carbonated drinks consumption. More attention should be given to this age group as they enter new lifestage from adolescence to adulthood.

Low vitamin D status among Malaysian women – what are the possible risk factors?

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Vitamin D deficiency is a major public health problem worldwide in all age groups, even in those residing in countries with abundant sunshine. Recently, there have been reports of low vitamin D status amongst Malaysian children and adolescents whilst a high prevalence of vitamin D insufficiency amongst postmenopausal Malay and Chinese women was first reported by Suriah et al. (2004). A high BMI was a significant risk factor for low vitamin D status in these postmenopausal women. A recent study conducted to measure serum 25(OH)D status in 400 urban and rural women in Kuala Lumpur and Palong, Negeri Sembilan reported rural dwelling, being Chinese and hours of sun exposure per week were the significant predictors of serum 25(OH)D levels. There is limited data on dietary vitamin D intake – rural women had significantly higher median intake of vitamin D compared to urban women (5.23 vs 4.61µg/day). Some unpublished data showed Malay women have significantly higher dietary intake of vitamin D and calcium compared to Chinese and Indian women. These studies also reported most of vitamin D intake is obtained from milk products, fish and shellfish and fortified cereals. However, no studies have been published reporting the consequences of low vitamin D status and poor dietary intake on health outcomes amongst Malaysian women.

Body mass index, weight perception and weight control practices among adolescents in Malaysia

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The prevalence of overweight and obesity among adolescents is rising rapidly in many countries around the world, including Malaysia. Parallel to the rise in obesity, there is

an increase in body dissatisfaction among adolescents. This study aimed to assess the association between body weight status, body weight perception and weight control practices among adolescents in Malaysia. A cross-sectional survey that included a body weight perception questionnaire and anthropometric measurements was conducted in a representative sample of 40,011 of students from Standard 4 until Form 5 with 90.5% response. The findings of BMI-for-age status showed 27.2% (95%CI: 26.8 – 27.6) were overweight and obese, 65.5% (95%CI: 65.1 – 66.0) were in the normal range, and 7.3% (95%CI: 7.0 – 7.5) were thin or underweight. Agreement between actual and perceived body weight status shows 13.8% (95%CI: 13.5 – 14.2) underestimated, 35.0% (95%CI: 34.4 – 35.4) overestimated and 51.2% (95%CI: 50.7 – 51.7) correctly judged their own weight. Near to half (47.5%) of them were trying to lose weight and another 18.8% were trying to gain weight. The overall appropriateness of weight control practices were 72.6% (95%CI: 71.9 – 73.4). There was an association between body weight status and body weight perception ($p<0.001$) and between weight status and appropriateness of weight control practices ($p<0.001$). Adolescents require energy and nutrients for rapid growth and development, however over-consumption combined with physical inactivity leads towards overweight and obesity. Adolescents attempting to lose or gain weight need to have better understanding towards desirable behavioural changes.

Calcium consumption and its association with bone mineral density of Malaysian adults

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Scientific studies on examination of skeletal benefits provided by calcium consumption showed controversial results (Flynn., 2003; Xu., *et al.,* 2004). There is lack of normative data regarding skeletal health on young Malaysian adults. Purposes of this study were to assess body composition and to estimate calcium intake and bone quality including bone mineral density (BMD) and broadband ultrasound attenuation (BUA) of young Malaysian adults from University of Nottingham Malaysia Campus (UNMC) in order to examine the association between calcium consumption and bone health. Thirty-seven healthy undergraduate students aged between 19 and 23 years were recruited. Dietary intake was obtained by using validated food frequency questionnaire (FFQ) and FFQ was analysed by computer software Diet Plan 6.0. Body composition was measured by bioelectrical impedance analysis (InBody 230, Biospace Co., Ltd). Bone health was measured by quantitative ultrasound (QUS) method (Sahara Clinical Bone Sonometer, Hologic, USA). Mean age was 22 (±1.4) years for males and 21 (±1.4) years for females. The mean energy and fat intake were significantly lower in males than in females, with 1,642 (±530) kcal/day compared to 1,768 (±1,056) kcal/day, and 58 (±29) g/day compared to 76 (±70) g/day, respectively ($P<0.05$). Calcium intake was higher in females which was 877mg (female) compared to 868mg (male). The readings of bone quality showed no significant difference between male and female participants. Calcium consumption of male participants was found to have significant positive correlation with BUA (84.0±16.3 dB/MHz) ($r=0.90$, $P<0.01$). Besides, significant positive correlation was found between energy intake and BMD (0.62±0.1 g/cm2) in male participants ($r=0.51$, $P<0.05$). Positive correlation was also found between calcium intake and bone health in females, however the correlation was not significant. We conclude that participants in our study met the Malaysian recommendation for calcium intake which is 800mg per day (Ministry of Health Malaysia, 2005). Further study has to be conducted to compare bone quality from our participants with standard values in Malaysian population.

Development and validation of a questionnaire on knowledge, attitude and practice towards whole grains among primary school children aged 10 and 11 years

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Numerous local questionnaires are available for assessing level of nutrition knowledge, attitude and practice (KAP) among school children. However, there is no specific questionnaire developed and validated for assessing whole grain KAP among Malaysian school children. The purpose of this study was to develop and assess the validity and reliability of whole grain KAP questionnaire among primary school children in Kuala Lumpur. A guided self-administered questionnaire compassing socio-demography 24 items, knowledge 15 items, attitude 15 items and practice 10 items was developed. After the questionnaire was developed, content validity was assessed by an expert panel, and face validity was assessed by ten school children aged 10 and 11 years. The questionnaire was revised based on scores provided by experts before pre-testing. A cross-sectional study designed to validate the KAP on whole grain questionnaire was conducted among 207 school children aged 10 and 11 years. Item analysis or construct validity, internal consistency and test-retest reliability of KAP on whole grain were examined. The construct validity was assessed using exploratory factor analysis with principle components method and varimax rotation. Sufficient variance was obtained for the factors in knowledge (70.8%), attitude (67.5%) and practice (76.4%). The results indicated that the internal consistency was good and acceptable for knowledge (KR20=0.70), attitude (CA=0.72) and practice (CA=0.73). For test-retest reliability-the intraclass correlation coefficients for knowledge, attitude and practice domains were 0.80, 0.78 and 0.79 ($p<0.001$), respectively. In conclusion, the KAP on whole grain that we have developed is a feasible, valid and reliable questionnaire. We anticipate that it will be useful tool for measuring children's knowledge, attitude and practice on whole grains; and that it will also be important as a tool for evaluating the effectiveness of nutrition education programmes, particularly those that focus on whole grain consumption among primary school children in Malaysia.

Symposium 5b: Nutrition Potpourri

Effects of media literacy education on television food advertising on school children

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Media literacy education is one of the strategies to reduce the influence of television food advertising. However, there is limited study done to assess its effectiveness. The objective of this study is to determine the effects of media literacy education on television food advertising among school children. This study used a quasi-experimental design involving two groups of children – intervention (N = 59) and control (N = 63) – with the mean age of 128 (3.37) months. The children in the intervention group were given a 10-lesson media literacy education conducted in three weeks during the school hours. The children in the control group attended normal classes. Data were collected before the intervention (pre-

intervention), 2 weeks after the intervention (2-week follow-up) and four weeks after the intervention (4-week follow-up), using a validated questionnaire. The ANOVA indicated that the children's knowledge on television food advertising, knowledge on healthier food and preference for healthier food increased significantly, F (1.74, 83.38) = 22.46, $p < 0.05$; F (1.22, 58.30) = 11.41, $p < 0.05$; and F (1.34, 64.50) = 13.10, $p < 0.05$; after the intervention. The ANOVA also indicated that there were significant differences in knowledge on television food advertising, knowledge on healthier food and preference for healthier food between the intervention and control group, F (2, 202) = 15.12, $p < 0.001$; F (2.42, 143.47) = 3.88, $p < 0.05$; and F (1.69, 170.61) = 10.38, $p < 0.001$. This study revealed that media literacy education is effective in increasing knowledge television food advertising, knowledge on healthier food and preference for healthier food among school children.

MyDIETRISK-BCa: A rapid tool for breast cancer risk assessment based on Malaysian dietary intake pattern

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Invasive screening and diagnosis methods for breast cancer make even educated women to desert the procedure until there is a symptom, in which by the time would be late for treatment. Diet has been associated with breast cancer risk among Asian women compared to their counterparts in Western countries and should be used as a component of risk assessment strategies. Therefore, MyDIETRISK-BCa was developed and validated to rapidly classify individuals into high or low risk group for breast cancer based on Malaysian dietary intake pattern. This self-administered index has a total of 20 items comprises selected epidemiological risk factors and dietary factors related to breast cancer risk. Scores were assigned according to weightage of known Odds Ratios and cut off points were established using Receiver Operating Characteristics analysis with a higher score indicating lower risk of breast cancer. Face validity of MyDIETRISK-BCa was evaluated by health professionals (n=10) and breast cancer patients (n=10). Content validity showed good agreement with Malaysian Dietary Guidelines and WCRF/AICR recommendation for cancer prevention. This newly developed MyDIETRISK-BCa dietary screening tool was then tested among users (n=96). The results showed that MyDIETRISK-BCa has high reliability in terms of response accuracy for dietary components by 90% to 99% correct classification and a maximum of 10% gross misclassification when compared with reference method i.e. food frequency questionnaire. It also has good stability with Pearson correlation coefficient value of 0.873 and a high internal consistency with Cronbach's alpha value of 0.871 in reliability assessment. Finally, MyDIETRISK-BCa was then tested for its validity in assessing breast cancer risk among 377 women undergoing standard initial diagnosis procedure for breast cancer i.e. fine needle aspiration cytology (FNAC) of the breast. Results showed that MyDIETRISK-BCa has good sensitivity (79-80%), specificity (85-91%), positive (66-83%) and negative (89-92%) predictive values and acceptable agreement (k=0.611-0.704) in assessing breast cancer risk besides demonstrating a high construct validity ($p<0.001$) in differentiating the high and low risk group for breast cancer risk. It also has a discriminative accuracy with ranges between 0.836 and 0.891. In the absence of non-invasive screening methods, MyDIETRISK-BCa offers a novel way to rapidly classify individuals into high or low risk group for breast cancer based on Malaysian dietary intake pattern. Besides, this tool can be used in the public health nutrition field for population monitoring, epidemiological research, evaluation of intervention and economic research.

Reliability and validity of a healthy meal preparation - knowledge, attitude and practice (HMP-KAP) instrument using Rasch measurement model

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Meals prepared at schools have been reported to be low in nutritional value. The school cooks who prepare the meals may not be adequately trained in providing nutritious meals. Most studies done to date are mostly focusing on the food handlers' knowledge, attitude and practice (KAP) on food safety aspects only. School cooks' KAP in relation to healthy meal preparation have not received much attention by the researchers. Therefore, this study was aimed at developing a validated and reliable instrument in determining the school cooks' KAP level with regards to healthy meal preparation. Other than few newly developed items, the instrument items were adopted from previous studies and modified accordingly. Only 84 food handlers who were involved in meal preparation at primary schools in Kelantan were conveniently selected as the respondents. The data were analyzed using Winstep version 3.80.1 which applied Rasch measurement model based on Item Response Theory (IRT) Models. Item reliability index was used in examining the instrument reliability while fit statistics which include the point-measure correlation (PTMEA Corr) index and MNSQ values and unidimensionality were examined for instrument construct validity. The item reliability for each KAP domains was between 0.86 and 0.96. The results also indicated that the PTMEA Corr for all items were in positive values. The Person and Items Distribution Map (PIDM) were evaluated to exclude items that were categorized as either too easy or too difficult. In addition, considerations for removal of items were made based on the Infit and Outfit MNSQ, and the ZSTD guidelines. To further improve the category definition, suggestions were made to collapse the 5 categories to four categories for attitude and practice domains. As a conclusion, a valid and reliable instrument in determining the school cooks' KAP level in preparing healthy meals was developed.

Body composition: Differences between elite national skills sport athletes

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The objective of this study was to determine the differences of body composition among Malaysian elite athletes of Tenpin bowling, Shooting, Archery and Lawn Bowls. Thirty three males (aged 18 – 36 years old) and twenty six females (aged 18 – 42 years old) participated in this study. Body composition was determined using bioelectrical impedance analysis (Inbody 230). Median for males body weight, skeletal muscle mass (SMM), body fat percentages, and BMI; 69.9kg, 30.2kg, 19.9%, and 24.8kg/m² respectively. Median for females' body weight, SMM, body fat percentages, and BMI; 59.9kg, 22.2kg, 35.4% and 23.0 kg/m² respectively. There was a significant difference between SMM and fat free mass (FFM) of the male and female skills elite athletes. SMM and FFM of the male archers

(33.3kg, 58.8kg) was significantly higher ($p < 0.05$) than shooters (28.5kg, 50.8kg). For females, tenpin bowlers (23.3 kg, 42.3kg) had significantly higher ($p < 0.05$) SMM and FMM than lawn bowlers (21.0kg, 38.8kg FFM). Male archers had higher SMM and FFM than shooters due to the differences of dynamic resistance training with higher strength endurance while shooters are more to isometric resistance. Meanwhile, for female tenpin bowlers, higher strength endurance requirement compare to lawn bowlers contributed the higher SMM and FFM. In conclusion, even though skills sport athletes generally having body fat percentage close to normal population and always being assumed as less athletic, but their SSM and FFM level do show the differences across different skills sport with different physical demand of the sports.

Physical activity energy expenditure, body composition and energy intake of university students: A descriptive study

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Physical activity energy expenditure (PAEE) can be measured objectively in free-living populations using accelerometer (Chang and Liang, 2010). Since PAEE varies among individuals, it can be quantified to determine its influence on body composition. The relationship between PAEE and percentage body fat (%BF) is not strong in the general population (Paul *et al.,* 2004). Physical activity patterns also differ between the genders during the week (Buchowski *et al.,* 2004). Besides, a high energy intake is known to cause changes in the body composition (Jequier, 2002). Thus, the aim of this study was to examine the relationship between PAEE and body composition and the influence of energy intake on body composition in young university adults. Accelerometer (Tanita AM120-E) was used to determine the energy expenditure of 55 subjects. Body composition was analysed using bio-impedance analyser (InBody230 Biospace, Seoul, Korea). Dietary intake was determined using weighed food record in 10 subjects. Males had significantly higher TEE and PAEE than females ($P<0.001$; $P=0.002$). After correcting for body weight, TEE and PAEE of males and females were similar. There was no difference in PAL (Physical Activity Level) between the genders. Males had higher TEE ($P=0.03$) and PAEE ($P=0.02$) during the weekday compared to the weekend day while females had similar energy expenditure during the week. TEE was significantly correlated with %BF in males ($r=0.47$, $P=0.02$) and females ($r=0.51$, $P=0.01$). The relation between PAEE and %BF was only significant in males ($r=0.55$, $P=0.003$). The energy intake of males and females were comparable but a significant association between %BF and energy intake ($r=0.81$, $P=0.03$) was evident only in females. This study concludes that males and females have similar energy expenditure after correcting for body weight but have different physical activity patterns during the week. There was a significant positive correlation between PAEE and %BF in males while energy intake was positively associated with %BF in females only.

Poster Presentations: Day 1 (Group A and E)

Group A: Nutritional Status (various groups) and Community Interventions

A01 Association of nutritional status and prevalence of diseases among institutionalized elderly in Klang Valley

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In this current era globalization, non-communicable diseases are becoming as one of the global burden and the prevalence of these chronic diseases are higher among older community. This study aimed to investigate the association of nutritional status and prevalence of disease among institutionalized elderly in Klang Valley. Private elderly institutions around Klang Valley which met the inclusion criteria were chosen in this study. A total of 68 institutionalized elderly (28 males and 40 females) aged of 60 and above with mean age of 68.03 ± 4.96 years old participated in this cross sectional study. Respondents were interviewed for their socio-demographic backgrounds and the nutritional status was assessed using Body Mass Index (WHO, 2004), Waist-hip-ratio (WHR), Mini Nutritional Assessment-Short Form (MNA-SF), 24 hour diet recall, previous medical records and based on past family history. As the results, mean BMI of the respondents was 22.3 ± 2.88 kg/ m^2 while the mean MNA-SF score of the respondents was 10.62 ± 2.312 ($p<0.05$). Based on 24 hour diet recall, energy intake per day was 965.03 ± 247.32 which was low according to the daily requirement based on Malaysian Dietary Guidelines, 2010. Prevalence of diabetes mellitus was the most common non-communicable disease among both male and female respondents 53.8% and 46.2% respectively, while hypertension was the second ranking as 53.8% and 46.2% respectively for males and female respondents. Approximately 51.5% respondents were at the risk of malnutrition and 10.3% was malnourished. As the conclusion, this study shows there is significant ($p<0.05$) association of nutritional status and relation between prevalence of disease, MNA score and also BMI among the institutionalized elderly. There is an urgent need for the community to establish public health nutrition policies which address the health and nutrition needs of older people to overcome the prevalence of non-communicable diseases among elderly.

A02 Development, implementation and effectiveness of intensive nutrition education program on healthy eating tailored for school adolescent in Kelantan

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This intervention study was conducted to compare the effectiveness of 3 week intensive nutrition education program on nutritional knowledge and healthy eating practices of school adolescents from rural and urban area of Kelantan. The pre- and post-intervention nutritional knowledge and eating habits were assessed using a validated questionnaire which consists of 25 questions. A total 95 students (Age: 16 years old) from two secondary

schools situated in Bachok (rural) and Kota Bharu (urban) district took part in the study. The nutrition education messages were convey using 3 different approaches comprise of short video clips, brochures and cross word game. Both groups of students received similar nutrition education program. Paired sample T-test was used to compare the changes in nutritional knowledge and eating habits score in each subject at pre- and post-intervention stage. Independent sample T-test was used to determine any significant difference in knowledge and eating habits score between urban and rural areas. This study demonstrated no significant difference of baseline nutritional knowledge scoring (73.67±14.99; 75.32±12.17, p=0.544) as well as eating habits (61.38±10.83; 63.65±11.26, p=0.752) between rural and urban area. At post-intervention, there were significant improvement shown by both groups in knowledge score (Rural: 82.75±13.69, p=0.003; Urban: 87.60±10.89, p<0.001) and eating habits score (Rural: 68.96±10.48, p<0.001; Urban: 71.68±13.83, p<0.001) respectively. However, no significant differences were noted between the two areas. The findings suggest that the nutritional education program via multimodal approaches utilized in this study had successfully enhances the nutritional knowledge and eating habits of target adolescents both from rural and urban areas.

A03 Association between body image perception, dietary practice, and physical activity with body weight status among undergraduate students in Universiti Putra Malaysia

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This cross sectional study determined the relationship between socio-demographic background, body image perception, dietary practice and physical activity with body weight status among 236 undergraduate Universiti Putra Malaysia (UPM) students from two randomly selected faculties. Body image, disordered eating, dietary intake, and physical activity were assessed using the Multidimensional Body Image Scale (MBIS), Eating Attitudes Test-26 (EAT-26), 2-day 24-hour dietary recalls, and International Physical Activity Questionnaire (IPAQ) respectively. A majority of the respondents were Chinese (48.3%), followed by Malay (47.0%), Indian (2.5%) and others (2.1%). There were 20.8% underweight, 66.5% normal weight, 9.3% overweight, and 3.4% obese respondents. The mean composite scores of MBIS for male and female respondents were 49.85 ± 9.31 and 58.91 ± 9.39 respectively. The means of energy intake for male and female respondents were 1518kcal and 1320kcal respectively. Around 12.7% female respondents were found to be at risk of disordered eating while none of the male respondents was at risk. Nearly half of the respondents were in moderate level of physical activity (male: 46.9%; female: 50.0%). The variables which were found to have significant relationships with body weight status were race (F=7.861, p=0.000), composite score of MBIS (r=0.438, p=0.000), EAT-26 score (r=0.193, p=0.003), and total METs (β=0.135, p=0.004). Multiple linear regression analysis showed three factors, namely composite score of MBIS (β=0.429, t=7.813, p=0.000), being Chinese (β=-0.297, t=5.412, p=0.000), and Indian (β=0.131, t=2.373, p=0.018) were found to be the predictors for body weight status. Planning intervention programs targeting overweight and obesity problems among undergraduate students should emphasize body image and race differences.

A04 Assessment of anaemia prevalence, knowledge and attitude regarding iron deficiency anaemia among female university staff of childbearing age in Kelantan

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Anaemia is a common problem primarily in the developing countries. A cross-sectional study was conducted to highlight the prevalence of anaemia among non-pregnant and non-lactating childbearing-age women between 20-49 years in School of Health Sciences, USM. The association between anaemia status and the level of knowledge and attitude towards iron deficiency anaemia (IDA) were also examined. Haemoglobin (Hb) screening was performed on capillary finger-prick blood samples using a portable STAT-Site M Hgb photometer. Anthropometry measurements including body weight and height were recorded. The self-administered questionnaire comprised of 49 questions on IDA-related knowledge with "Yes" and "No" answer options and 7 statements regarding attitude towards anaemia prevention with 5-point Likert Scale agreement options. A total of 66 respondents participated in the study. Independent sample T-test and Chi-squared test were used to analyse the data. The mean age of the study population was 36.03 ± 6.40 years, with half of them were between 30-39 years of age. The prevalence of anaemia (Hb < 12.0g/dL) was 10.6%, with majority (9.1%) of the respondents were mildly anaemic (Hb 11.0 - 11.9g/dL), whereas 1.5% were moderately anaemic (Hb 8.0 – 10.9g/dL). None of the severe anaemia case was reported. The mean scores of knowledge and attitude were 73.84 ± 12.89% and 93.46 ± 8.16%, respectively. Both groups of respondents did not show any significant difference in the mean scores of knowledge (72.89 ± 6.41% and 73.95 ± 13.49%, p = 0.84) and attitude (95.5 ± 7.53; 93.22 ± 8.26, p = 0.49). Despite present study showed a lower prevalence of anaemia compared to other studies, nonetheless, anaemia prevalence was usually taken as a baseline screening for IDA. Thus, this study may proposed that other underlying causal factors also need to be taken into consideration as preventive measure to IDA especially in childbearing-aged women.

A05 Vitamin D status of the Malay adolescents in the Klang Valley

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Vitamin D deficiency has become an important healthcare issue worldwide. Local data have reported high prevalence of vitamin D deficiency in adults and children. The aim of this study is to determine the vitamin D status amongst the Malay adolescents (12-17 years old) in Klang Valley. This cross-sectional study was carried out in five secondary schools in Klang Valley. The body weight, height, waist (WC) and hip circumference (HC) of the participants were measured. All eligible participants were interviewed to obtain their socio-

demographic data. Skin colour was determined using a 16-point cosmetic colour chart. Venous blood was drawn for the measurement of plasma 25-hydroxyvitamin D (25-OHD). Participants with 25-OHD of less than 50 nmol/L was considered deficient in vitamin D. A total of 407 Malay adolescents (mean age 14.4±1.22years) participated in this study. Seventy percent (n=284) of them were female. Mean BMI of the participants was 25.66±6.88kg/m^2. Mean waist circumference and waist-to-hip ratio (WHR) were 76.00±15.16cm and 0.79±0.07 respectively. Mean 25-OHD of the participants was 31.98±14.77mmol/L. Male participants had significantly higher 25-OHD (44.52±15.74mmol/L) compared to the females (26.56±10.41 mmol/L) ($p<0.001$). Prevalence of vitamin D deficiency was 86.7% (n=353). Almost all the females (97.9%) had vitamin D deficiency compared to only 61% of the males with deficiency ($p<0.001$). In males, WC ($r=-0.236$) and WHR ($r=-0.285$) were significantly negative correlated with 25-OHD ($p<0.05$). In females, significant negative correlation were shown between WC ($r=-0.148$) and HC ($r=-0.158$) with 25-OHD ($p<0.05$). Significant correlation was not found between BMI and 25-OHD in neither males nor females ($p>0.05$). In conclusion, majority of the Malay adolescents had vitamin D deficiency. Vitamin D status was significantly correlated with WC and WHR. Further study to explore the associated risk factors of vitamin D deficiency and its consequences are needed.

A06 Teachers' perception and acceptance against School Supplementary Feeding Programme (SSFP) or Rancangan Makanan Tambahan (RMT)

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A cross-sectional study was conducted to study the perception and acceptance of teacher against School Supplementary Feeding Programme (SSFP) in Kota Bharu, Kelantan. The respondents were recruited from eight primary schools in Kota Bharu by using cluster sampling. A self-administered questionnaire was distributed to primary school teachers who directly or indirectly involved in SSFP in the selected schools. The questionnaire comprised of 4 sections: socio-demographic background, basic knowledge (10 items), perception (18 items) and acceptance to SSFP (10 items). Statistical analyses were performed by descriptive statistics and Chi-square tests. A total of 341 respondents aged 24 to 60 years old (mean age= 44.11 years, SD= 0.40) completed the questionnaires. The results revealed that almost all of them were Malays and married, 71.8% were female, more than half of them had completed degree level of education and the mean years of teaching was 18.5 years (SD= 8.35). Majority of them had not participated in any nutrition education before and 70.7% were teachers on duty in SSFP. More than half of the respondents had high knowledge regarding SSFP (mean= 7.70, SD= 1.25) and nearly all (99.4%) of them could identify the objectives of the programme. Around three quarter of the respondents had neutral perception (mean= 64.59, SD= 8.21), and fair acceptance to SSFP (mean= 34.95, SD= 4.42), respectively. The findings of the study indicated significant associations between perception and acceptance ($p<0.001$) and between gender and acceptance ($p<0.001$) to SSFP. However, no significant association was found between respondents' knowledge and other socio-demographic factors with their acceptance to the programme. This study revealed that majority of the respondents agreed that SSFP should be continued but improvement of the programme is needed. Therefore, it was recommended that menu modification and regular monitoring from state of authorities are needed to ensure the effectiveness of SSFP.

A07 Assessment of nutritional status and dental caries among adults aged 19-59 years attending government dental clinics in klang valley

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Dental caries is one of the common diseases which are attributed by many factors inclusive of oral health behavior and nutritional status. This study aimed to assess the association between nutritional status and dental caries among adults aged 19-59 years old attending government dental clinics in Klang Valley. This cross – sectional with convenience sampling method was conducted among 334 respondents (41% male; 59% female). Most of the respondents were overweight, with a mean BMI of 24.88 ± 5.27 kg/ m^2. There were significant differences found between BMI and gender ($p<0.01$), visceral fat levels and gender ($p<0.01$), as well as body fat percentage and gender ($p<0.05$). Prevalence for dental caries was 87.4% with mean DMFX (T) of 7.53±6.77. Moreover, there were significant associations found between dental caries and oral health behaviors such as consumption of high sugar food ($p<0.001$), consumption of soft drinks ($p<0.01$), and visits to dental clinics ($p<0.01$). A relatively high number of adults (82.3%) practiced excellent oral hygiene. Female respondents (86.3 %) were found to have better oral hygiene compared to male. As for physical activity (PA) level, moderate PA seem to be most practiced among all respondents. There were significant difference observed between physical activity levels and gender ($p<0.007$). Besides that, significant difference was found between percentage of body fat and physical activity levels ($p<0.01$) and dental caries with PA ($p<0.05$). This study can provide the opportunity for health care planner to identify risk factors in order to develop approaches to combat dental caries problem for the adult population.

A08 Associations of psychological stress domains and metabolic biomarkers among Malaysian adults

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The objective of the study was to investigate the correlations between psychological stress level and the response in intermediate metabolic biomarkers such as fasting blood glucose level, blood pressure and blood lipid profiles. Identified psychological domains including stress, anxiety and depression level were assessed using Depression, Anxiety and Stress Scale (DASS -21) questionnaire in the study. Anthropometry parameters such as Body Mass Index (BMI), waist circumference were measured according to standardized ISAK protocols. The fasting glucose level and blood lipids level were assessed using point-of-care CardioCheck PA Analyzer while blood pressure measurements were taken using Omron HEM-7200 digital blood pressure monitor. This cross-sectional study was conducted in the period of January to April 2014 in a fast moving consumer goods (FMCG) company in Petaling Jaya. A total of 60 respondents participated in the study comprising of 75% women. Using the International Diabetes Federation's definition for Metabolic Syndrome, almost a quarter of the respondents was identified having Metabolic Syndrome. One third of the study population is presented with central obesity whilst the mean BMI was 23.16 ± 3.94kg/m^2. From the DASS-21 questionnaire, one third of the respondents reported to

be experiencing psychological stress. Half of the respondents experienced anxiety, while another forty percent of the respondents have signs of depression. The mean systolic and diastolic blood pressures for men were higher than the women 133.87 ± 14.81 and 84.07 ± 12.51 mmHg respectively. Similarly, the total cholesterol and LDL-cholesterol were higher among the men than the women. Among the blood lipid, HDL-cholesterol level was found to have a negative correlation with stress in men ($p>0.05$). Also in men, fasting blood glucose level was found to be negatively correlated with stress, anxiety and depression. No correlations were established for stress and other metabolic biomarkers. In the present study, no significant correlation can be established for psychological stress domains with fasting blood glucose, blood pressures and blood lipid profiles.

A09 Body mass index and the risk of excessive gestational weight gain among third trimester pregnant women in Bachok district, Kelantan.

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This cross-sectional study was purposely done to determine body mass index and gestational weight gain among third trimester (32 to 40 weeks) pregnant women attending health centers in Bachok district, Kelantan. Data collection was done through face-to-face interview among the pregnant women. Gestational weight gain was categorized into three groups inadequate, adequate and excessive defined as below, within and above based on Institute of Medicine (IOM) recommendations. Among underweight pregnant women, 48.4% of them gained inadequate gestational weight gain. Whereas 44.8% of obese pregnant women gained excessive weight gain. Multiple Logistic Regression showed that overweight pregnant women will increase the risk of gaining excessive weight gain by 2.8 times than normal pregnant women (OR:2.76, CI:1.26-6.08, p=0.012). Furthermore, obese pregnant women will increase the odd of gaining excessive weight gain by 4.5 times (OR:4.54, CI:1.76-11.68, p=0.002) than normal pregnant women. This study concluded that overweight and obese pregnant women should be given counselling to control their gestational weight gain. They should be given advices to reduce their weight before planning to conceive. Further intervention study should be done for pregnant population to reduce the risk of inadequate

A10 Assessment of nutritional status and physical activity level of trishaw peddlers in Kota Bharu, Kelantan and Kuala Terengganu, Terengganu

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Nutritional status is a state where the intake of a diet is sufficient or insufficient to meet or exceed the needs of the individual to keep the composition and function of the individual within the normal range. Physical activity is defined as any bodily movement produced by skeletal muscles that result in energy expenditure. Kilojoules (kJ) or kilocalories (kcal) can be used to measure the amount of energy required to accomplish an activity, where 4.148 kJ is equivalent to 1 kcal. The purpose of this study is to determine the nutritional status and physical activity level of trishaw peddlers in Kota Bharu, Kelantan

and Kuala Terengganu, Terengganu. A total of 55 trishaw peddlers were successfully recruited by convenient sampling in this study. Nutritional status of the respondents were determined using World Health Organization (WHO) Body Mass Index (BMI) classification. The validated Malay version of Global Physical Activity Questionnaire (GPAQ) was used to assess the physical activity levels of the respondents. All 55 respondents are men, and of Malay ethnicity, aged 45 years and above. Eleven (20.0%) of them were underweight, 36 (65.5%) with normal BMI, 6 (10.9%) were overweight, and 2 (3.6%) were obese. Mean BMI of respondents from Kota Bharu (21.56 ± 3.67 kg/m2) showed higher value than those from Kuala Terengganu (22.22 ± 2.62 kg/m2). All 55 respondents met the WHO recommendation for physical activity, with a mean physical activity level of 4765.71 ± 1847.67 MET-minute/ week and 5323.08 ± 2291.75 MET-minute/week for respondents from Kota Bharu and Kuala Terengganu, respectively. No significant associations were found between BMI and physical activity levels in both groups from Kota Bharu and Kuala Terengganu. There were also no significant associations found between BMI and serum hemoglobin level in both groups of respondents.

A11 Vitamin D status and its association with adiposity among multi-ethnic teachers in Wilayah Persekutuan Kuala Lumpur

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Vitamin D deficiency is highly prevalent globally. Existing evidences showed adiposity was associated with vitamin D deficiency in the West, however there was a scarcity of such evidence in the East. Therefore, we aimed to identify the factors contributing to vitamin D deficiency and its association with adiposity. This was a cross sectional study conducted among secondary school teachers in the state of Wilayah Persekutuan Kuala Lumpur (WPKL). Multistage sampling was conducted. Data collection included serum 25-hydroxyvitamin D (25(OH)D), Parathyroid Hormone (PTH), fat percentage, Body Mass Index (BMI) and questionnaire survey. Validated questionnaire on demographic characteristics, sun exposure avoidance and short Malay International Physical Activity Questionnaire (IPAQ) was self-administered. Complex sample analysis was conducted. Significant level was preset at 0.05. The weighted mean±standard deviation for age was 40.02±9.02 years. The weighted mean serum 25(OH)D and PTH were 17.97±7.32 ng/ml and 6.13±3.74 pmol/L respectively. The prevalence of vitamin D deficiency (<20ng/ml) was 67.4%. Indian respondents had the highest proportion of vitamin D deficiency (80.9%) followed by Malays (75.6%), others (44.9%) and Chinese (25.1%). The mean fat percentage and BMI were 28.10±8.00 and 25.66±5.06 kg/m^2 respectively. There was significant negative correlation of serum 25(OH) D with fat percentage (r=-0.95, p=0.005) and BMI (r=-0.98, p<0.005). Participants with low level of physical activity had highest proportion of vitamin D deficiency (77.4%) followed by moderate (62.9%) and high (60.4%). In the univariate logistic regression analysis, females (OR=7.09; 95%CI:3.65,13.76), Malays (OR=9.21; 95%CI:5.65,15.01), every 10% increase of fat percentage (OR=1.53; 95%CI:1.13,2.08), obesity (BMI >27 kgm^2) (OR=1.82; 95%CI:1.08,3.07), sun avoidance (OR=1.30; 95%CI:1.04,1.62) and low physical activity (OR=2.24; 95%CI:1.30,3.84) were significantly associated with vitamin D. This findings showed that gender, race, adiposity, sun avoiding behavior including clothing style and physical activities were associated with vitamin D status.

A12 Association of body mass index to risk of cardiovascular disease mortality and all-cause mortality in Malaysian adults

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High body mass index (BMI) has been linked with increased risk of mortality in large prospective observational studies, mainly in European, North American and a few Asian countries, but has not been investigated in the Malaysian population. The objective of this study is to determine the relationship between BMI and risk of cardiovascular disease (CVD) mortality and all-cause mortality in a nationally representative sample of Malaysian adults. A sample of 32,844 adults aged 18 years and above from the third National Health and Morbidity Survey (NHMS) 2006 was followed up for 5 years. Mortality data from 2006 to 2010 for the NHMS cohort were obtained via record linkages with the Malaysian National Registration Department. Time-independent Cox regression was applied to compare risk of CVD and all-cause mortality between BMI categories adjusted by smoking status, age, gender and ethnicity. During the study period, there were 1037 (591 men and 446 women) deaths from all causes and 218 (134 men and 84 women) deaths from CVD. With normal BMI category (18.5 to <23.0 kg/m^2) as reference, underweight (BMI <18.5 kg/m^2) was associated with a significantly increased risk of death from all causes (adjusted Hazard Ratio (HR): 1.32, 95% confidence intervals (CI): 1.08, 1.60). But, overweight (BMI 25.0 to <30.0 kg/m^2) was inversely associated with risk of all-cause death (HR: 0.82, 95% CI: 0.696, 0.976). Excess risk of CVD mortality (HR: 2.28, 95%CI: 1.14, 4.56) was observed for those in the obesity class II category (BMI > 35.0 kg/m^2). Our study suggests that underweight is associated with increased risk while overweight is associated with significantly lower all-cause mortality when compared to normal BMI. High levels of obesity are associated with heightened risk of mortality due to CVD.

13 Measurement of physical activity level among Malay and Chinese female students of Food Science Program in UKM: questionnaire and pedometer

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Measurement of physical activity level among female students is important due to the fact that physical inactive increases the risk of getting chronic disease. This study was carried out to determine the correlation and evaluate the use of questionnaire and pedometer in measuring the physical activity level among Malay and Chinese female students of Food Science Program in UKM. This study involved 60 female students in which 30 of them were Malay students and 30 were Chinese students. Body Mass Index was measured by using SECA measurements. Physical activity level was evaluated by using *Global Physical Activity Questionnaire* (GPAQ) and Omron pedometer. Results showed that 40% of the respondents [14 Malay respondents and 10 Chinese respondents] were classified as moderately active by using GPAQ. However, there was no significant difference in physical activity level between ethnic was found. Pedometer results showed that 80% of the respondents [26 Malay respondents and 22 Chinese respondents] were classified as moderately active with no significant difference in physical activity level between ethnic was observed. Interestingly, positive and significant correlation was shown between GPAQ and pedometer measurement. As a conclusion, ethnic background did not affect physical activity, measured with GPAQ and pedometer in the population studied.

A14 Association of weight status with socio-demographic factors, sleep quality, nutrient intake among working adults

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Rapid and marked socioeconomic advancement in Malaysia has brought about significant changes in the lifestyles of the people. Changes in lifestyle are more evident among working adults whereby more families prefer eating out, skip meals and compromise their sleep in order to fulfil their daily job demands. The present study was aimed to determine the association of weight status with socio-demographic factors, sleep quality and nutrient intake among working adults. One hundred and thirty subjects volunteered to participate in this study. A structured self-administered questionnaire was used to collect the information on socio demographic characteristics of the subjects. Weight status was determined in terms of Body Mass Index (BMI) and waist-hip ratio (WHR). Information on sleep quality was obtained using the Pittsburgh Sleep Quality Index (PSQI). Nutrient intake was extrapolated from the 24 hour diet recall. The age ranged from 22-63 years with a mean age of 37.18±10.98 years. The study population comprised of 53.1% males and 46.9% females. The prevalence of overweight (36.2%) was the highest, followed by obesity (34.6%). Only 26.2% of the subjects had a normal weight status. About 33.8% of the participants were found to have abdominal obesity. There were significant association found between weight status and age ($p = 0.003$, OR = 3.3, 95% CI =1.48-7.53), ethnicity ($p = 0.005$), marital status ($p=0.000$, OR = 5.0, 95% CI =2.20-11.16) and educational level ($p = 0.015$, OR = 2.8, 95% CI = 1.21-6.63). There was significant association between weight status and sleep quality score ($p=0.014$).This indicated that the working adults who were overweight or obese had poor sleep quality compared to normal weight. Overweight and obesity was positively associated with nutrients like protein ($p = 0.014$), fat ($p = 0.001$), calcium ($p = 0.003$), thiamine ($p = 0.000$), riboflavin ($p = 0.004$), niacin ($p=0.005$) and sugars ($p=0.000$). These findings indicate that lifestyle modifications can downplay the increasing trends of overweight and obesity among working adults.

A15 Associations of socio-demographic factors with body mass index and waist circumference of Malaysian preschoolers

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The aim of this study was to determine the association of socio-demographic factors with preschoolers' body mass index (BMI) and waist circumference (WC). This survey is part of SEANUTS, a multi-centric study carried out among 16,744 children aged 0.5 to 12 years in four countries in South East Asia. A total of 979 Malaysian children (517 boys, 462 girls) aged 4.0 to 6.9 years old were included in this analysis. Socio-demographic factors included parental BMI, parental education level and number of children in the family; while anthropometric variables included weight, height, WC and BMI. The children comprised 51.9% Malay, 23.0% Chinese, 5.4% Indian and 19.7% other ethnicities. The majority of parents (father 62.7%; mother 62.2%) completed secondary education. Mean paternal and maternal BMI were 25.27 ± 4.04 kg/m^2 and 24.02 ± 4.32 kg/m^2, respectively.

Boys had significantly higher ($p<0.05$) BMI and WC (15.76 ± 2.65 kg/m^2; 52.05 ± 6.88 cm) than girls (15.34 ± 2.47 kg/m^2; 50.37 ± 6.10 cm). Parental BMI was positively correlated with preschoolers' BMI (paternal r=0.224; maternal r=0.248, $p<0.001$), as well as with preschoolers' WC (paternal r=0.180; maternal r=0.187, $p<0.001$). Regression model showed that preschoolers' BMI increased by 0.50 kg/m^2 with every 6.10 kg/m^2 increase in paternal BMI or 3.76 kg/m^2 increase in maternal BMI with other covariates held constant. Similarly, preschoolers' WC increased by 1 cm with every 5.07 kg/m^2 increase in paternal BMI or 3.42 kg/m^2 increase in maternal BMI with other covariates held constant. Preschoolers' BMI and WC decreased by 0.178 kg/m^2 and 0.67 cm, respectively, with every additional child in the family. In conclusion, preschoolers with parents who had higher BMI and those from families with lower number of children were more likely to have higher BMI and higher WC. Parents should be role models and encourage healthy lifestyle in their children.

A16 Vitamin D status and its associated factors in healthy pregnant mothers and their newborns.

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This study was conducted to determine vitamin D status of healthy pregnant mothers and their newborns as well as factors associated with it. A total of 77 pregnant mothers at 36 weeks of gestation and above, who attended a private hospital in Klang Valley was recruited for this study. All the pregnant mothers were free from pregnancies complications (pre-eclampsia, eclampsia and gestational diabetes). Maternal and cord blood samples were taken at delivery. Plasma 25-hydoxyvitamin D (25(OH)D) concentrations were analyzed using chemiluminescence assay. The dietary vitamin D intake was estimated using vitamin D specified Food Frequency Questionnaire (FFQ). Information was also obtained on nutritional supplement intake, skin types and pregnancy history. Results showed more than half (61.0%) of mothers were vitamin D insufficient (<50nmol/L) even though all of them took vitamin D containing supplements of at least 200IU per day. Nonetheless, only 35.1% of the neonates born had vitamin D insufficiency (<50nmol/L). The mean 25(OH)D of neonates (56.97 ± 17.09 nmol/L) was significantly higher than maternal 25(OH)D (47.12 ± 14.72 nmol/L) ($p<0.001$). No significant association seen between maternal and neonatal 25(OH)D concentration with supplemental vitamin D intake, dietary vitamin D intake and skin types. In simple linear regression, neonates 25(OH)D was positively associated with maternal 25(OH)D ($\beta=0.731$, $p<0.001$), gravidity ($\beta=0.301$, $p=0.01$), parity ($\beta=0.288$, $p=0.014$) and prepregnancy body mass index ($\beta=0.248$, $p=0.041$). The study indicate that pregnant mothers from Klang Valley have suboptimal vitamin D level regardless of taking vitamin D containing supplements. Sun exposure should be assessed for better prediction of 25OHD.

A17 Development and evaluation of weight reduction booklet for overweight and obese working adults

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In view of rising trend of eating out and obesity, this study was conducted to develop a booklet on weight reduction for overweight and obese working adults and to evaluate their acceptance towards the booklet. This study was divided into 4 phases. Phase 1 was need

assessment on the available printed educational materials about weight reduction, recipe books and planning of the content of booklet. Phase 2 was the development of content and layout of booklet. The booklet consisted information on obesity, ways to reduce weight safely and guides towards healthy eating. It consisted of 1200kcal and 1500kcal of Malay, Chinese, Indian and Western menu which were meant for weight reduction for most women and men respectively. Phase 3 was content validity which was conducted by 7 health professionals. In phase 4, the evaluation of acceptance of the booklet was conducted in among 38 working adults (14 males; 24 females) in Kuala Lumpur, aged between 19 to 59 years. The validated questionnaire i.e. the Tool to Evaluate Material Used in Patient Education (TEMPtEd) was used to evaluate the suitability of the booklet in 5 subscales including content, motivating principles, literacy, layout and typography and graphics. The results showed that the mean score of content was 18.58 ± 2.81, motivating principles was 5.11 ± 1.11, literacy was 7.53 ± 1.45, layout and typography was 12.92 ± 2.32 and graphic was 7.92 ± 1.32. The mean total score of TEMPtEd was 53.08 ± 7.65 which was categorized as good suitability. Thirty-two out of 38 subjects accepted the booklet. There was no correlation between ethnic, gender, age, education level and Body Mass Index (BMI) category with the total mean score TEMPtEd.

A18 Associations of health literacy and metabolic parameters amongst Malaysian adults

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The objective of the study was to determine the associations between level of formal education, health literacy and metabolic parameters amongst Malaysian adults. Information on socio-economic background was collected via self-administered questionnaire while assessments of health literacy were assessed using two validated tools - Rapid Estimate of Adult Literacy in Medicine (REALM) and Newest Vital Sign (NVS).The blood pressure were measured using OMRON HEM-7200 whereas the blood parameters were assessed using CardioChek PA Analyzer Glucose and LIPID Panel Test Strip. This cross sectional study was conducted from Jan to April 2014 in an identified fast moving consumer goods (FMCG) company in Petaling Jaya. Using a stratified randomization sampling based on gender distribution, a total of 60 working adults (15 men and 45 women) participated in the study. All the participants completed national secondary education level whilst almost 80% received tertiary education. Nevertheless, the REALM questionnaire showed that more than 70% of the participants were in the category of having low health literacy level. On the other hand, NVS suggested that half of the respondents did not possess adequate skills to comprehend nutrition food label. The mean of blood pressure was found to be significantly higher in men than women. The men were also having higher fasting blood glucose level. On the other hand, the women displayed higher level cholesterol, LDL cholesterol and HDL cholesterol levels than their counterparts. Significant negative correlation between systolic blood pressure ($r = -0.523$, $p < 0.05$), and diastolic blood pressure ($r = -0.638$, $p < 0.05$) with health literacy were observed only in men using REALM score. In women, NVS demonstrated to be more sensitive in predicting the correlations between health literacy and diastolic blood pressure ($r = -0.366$, $p < 0.05$); HDL cholesterol ($r = 0.430$, $p < 0.05$); LDL cholesterol ($r = -0.330$, $p < 0.05$). From the current findings, health literacy levels posed as a predictor for blood pressure readings in both men and women, and blood lipid levels in women only.

A19 Physical activity and cognitive function among preschool children in Segamat, Johor

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The objective of this study was to examine the association between physical activity and cognitive function among preschool children in Segamat, Johor. This is a cross-sectional study which involved pre-school children age 4-6 years old. Preschool-age Children's Physical Activity Questionnaire (Pre-PAQ) was completed by the parents whereas for the measurement of cognitive function among preschool children, McCarthy Scales of Children Abilities (MSCA) was used. Height and weight of the preschoolers were measured and BMI-for-age was calculated. A total of 154 respondents completed the assessment. The prevalence of overweight and obesity were 6.5% and 3.2% respectively. The mean amount of time spent on sedentary activity within a week was 533.86 minutes (SD=292.57) while mean amount of time spent on physical activity within a week was 108.96 minutes (SD=106.15). Amount of time spent on sedentary activity was correlated with the amount of time spent on physical activity (r=0.193, p=0.008). Whereas the general cognitive index among preschool children were 111.55 (SD = 0.96) and only 16 and 46 children were classified as dull normal and average. A positive relationship was found between physical activity and the general cognitive index scores (r = 0.453; p=0.001). However, cognitive function (r = -0.04, p= 0.626) and physical activity (r=0.002; p=0.979) was not found to be correlated with BMI. In conclusion, findings from this study suggested that physical activity should be encouraged both for the prevention of childhood obesity and also for a better cognitive performance in children.

A20 Body image perception, perfectionism and risk of eating disorders among Malay adolescents in Kuala Lumpur

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Risk factors for eating disorders among adolescents have been known to include body image concerns and perfectionism. The aim of this study was to determine the relationships of body image perception and perfectionism with risk of eating disorders among Malay adolescents aged 10 to 14 years. A total of 187 students (90 boys; 97 girls) from primary and secondary schools in Kuala Lumpur participated in this study. Body weight and height were measured and body mass index calculated. Questionnaires including *Figure Rating Scale*, *Children and Adolescents Perfectionism Scale* (CAPS) and *Eating Disorders Inventory-2* (EDI-2) were self-administered. Subjects were categorized into two main BMI categories: non-overweight or obese (non-OW/OB) and overweight or obese (OW/OB). Majority (63.3% boys; 73.2% girls) perceived their body weight correctly. Girls had higher mean body dissatisfaction score than boys and OW/OB subjects achieved significantly higher positive body dissatisfaction score than their non-OW/OB counterparts ($p<0.001$). Similarly, mean score of *Self-oriented Perfectionism* (SOP) ($p<0.05$), *Socially-prescribed Perfectionism* (SPP) subscales and total score of CAPS were higher among girls than boys. Boys had more perfectionism traits in SPP subscale while girls were more towards SOP subscale. There was a lack of association between perfectionism and body image perception (p=0.30). Body image perception correlated positively ($p<0.01$) with *Drive for Thinness* and *Body Dissatisfaction*

subscales of EDI-2. CAPS correlated positively with subscales of EDI-2: *Asceticism*, *Impulse Regulation*, *Social Insecurity* at $p<0.05$, *Perfectionism* ($p<0.01$) and correlated negatively with *Interpersonal Distrust* ($p<0.01$). In conclusion, body image perception and perfectionism were correlated with risk of eating disorders among adolescents. Appropriate education on body image and perfectionism should be implemented in schools in order to establish proper attitude and sensible on individual perception towards body image and perfectionism among adolescents.

A21 Printed educational nutrition materials: Assessment and acceptance among secondary school students in Perlis

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Printed educational nutrition material is the primary mode of communication in public healthcare education. This study was aimed to evaluate the existing printed nutrition educational materials published by Ministry of Health, Malaysia. A validated questionnaire which is the *Tool to Evaluate Material Used in Patient Education* (TEMPtEd) was used to assess suitability of the pamphlet in five subscales including content, motivating principles, literacy, layout and typography, and graphics. One part of the TEMPtEd questionnaire is *Simple Measure of Gobbledygook* (SMOG) test to determine the readability grade level of printed material. SMOG test done by the researcher, while the other parts was self-administered by the subjects. The SMOG test was presented in 4 categories based on the score of 0 (very unsatifactory), 1 (unsatisfactory), 2 (good) and 3 (excellent). Whereas, for the total score of TEMPtEd, was presented in 4 categories which were, excellent (51-63), good (50-56), medium (45-50) and unsuitable (0-44). A total of 215 individuals comprised of 115 males and 100 females were involved in this study. Two pamphlets which entitled "*Kurangkan Lemak*" and "*Makan Lebih Buah dan Sayur*" was distributed to the subjects for this study. Subjects were given about 30 minutes to complete the pamphlets and the questionnaires. This study found both pamphlets were categorized as unsatisfactory level based on SMOG test. While for mean total score of TEMPtEd for *"Kurangkan Lemak"* and "Makan Lebih Buah dan Sayur" were 43.80 $\pm$8.23% and 44.47 $\pm$ 9.31 % respectively, which categorized as unsuitable. Therefore, this study suggests there is a need to improve the quality of the pamphlets. This will ensure public understands health messages conveyed through printed educational materials.

A22 Food insecurity, school performance and behaviour of primary school children among low income households in Shah Alam, Selangor

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This study was conducted to determine the prevalence of food insecurity among low income households in Shah Alam and to compare nutritional status, school performance and behavior of the primary school children (n=98) by food insecurity levels using a structured questionnaire. Most of the respondents were Malay (n=66) and Indian (n=32), aged 7 – 12 years old, with number of boys (n=40) and girls (n=58) respectively. Mothers were asked

to answer a structured questionnaire to gather information on household socioeconomic and demographic status. Radimer/Cornell Hunger and Food Insecurity Instrument were used to classify the households into four levels of food insecurity. Children's weights and heights were measured and converted into Z-scores using ANTHRO software to classify the children into stunting, underweight and overweight. Examinations results for five subjects (Mathematics, Science, English and Malay Language – comprehension and composition) were obtained from schools and converted into percentage of total scores (% TS), which were further classified into A (%TS 80-100), B (%TS 70-79), C (%TS 40-59) and D (%TS 0-39) respectively. Very Short Form of the Children's Behavior questionnaire used to obtain children behavior category which is surgency, negative affect and effortful control. Descriptive and statistical analyses were conducted using Statistical Package for Social Science Version 21.0. Majority of the respondent (91.8%) reported household food insecurity. Most of the parents experienced child hunger 50.0%, individual food insecurity 21.4%, household food insecurity 20.4% with only a small percentages of the household were food secure 8.2%. Averages of height-for-age and BMI-for-age *z*-sores were -1.00 $\pm$ 1.17 and 0.01 $\pm$ 1.53 respectively, which fall under normal category. The prevalence of significant underweight, stunting and overweight was 8.2%, 17.3% and 13.3 respectively. Most of the primary school children had an average school performance, %TS = C (40-60). Most of the children behaviour falls under effortful control 70.4%, negative affects 20.4% and surgency 9.2%. Food insecurity could be an important indicator of school performance and subsequent child development with regards to the low income households in Malaysia.

A23 Factors associated with waist-to-height ratio (WtHR) among male Malay adolescents in SMK Tun Perak, Jasin, Melaka

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A cross-sectional study was conducted to determine socio-demographic status, frequency of sugar-sweetened beverages consumption, physical activity (PA), energy intake (EI) and their association with waist-to height ratio (WtHR). Respondents were 109 male Malay adolescents, from 3 age groups (13, 14 and 16 years) and selected from one secondary school in Jasin, Melaka. Self-administered questionnaire was used to obtain respondents' socio-demographic background. The consumption of fourteen beverages was measured using semi quantitative food frequency questionnaire (FFQ), whereas EI was measured using two-day food record. PA level was assessed using the International Physical Activity Questionnaire (IPAQ). Of 109 respondents, 67% had normal weight, while 32% and 0.9% respectively were overweight and obese and thin. The top three frequently consumed beverages were plain water (330.66±128.27 ml/day), followed by malted drink (115.75±68.14 ml/day) and coffee (102.93 ± 76.00 ml/day). Conversely, the least frequent beverage consumed was vegetable juice (13.78±32.34 ml/day). The mean PA score was 3.00±0.44 with respondents aged 14 years (11.4%) being physically active compared to respondents aged 13 (8.3%) and 16 years (4.3%).The mean EI was 2284±714 kcal/day and respondents aged 16 years had higher mean EI (2342±825 kcal/day) than the other two age groups. There were no significant associations between socio-demographic characteristics and PA and WtHR. BMI for age (r=0.788) and EI (r=0.429) were significantly and positively correlated with WtHR ($p<0.05$). Chi-square test indicated that the consumption of plain water (x^2=8.440, p=0.004) and diet soda (x^2=5.585, p=0.018) showed significant associations with the increased risk of abdominal obesity based on WtHR. The need of other measurements such as BMI, waist circumferences and waist-to-hip ratio should be used together with WtHR to find their associations with the studied variables. These measurements are important to assess body fatness as abdominal obesity especially among adolescents is growing at alarming rate in Malaysia.

A24 Prevalence and correlates of physical disability among free living elderly in Mukim Batu, Gombak District of Selangor

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Physical disability is common among the elderly, leading to adverse consequences such as dependency and institutionalisation. This cross-sectional study was conducted to determine the prevalence of physical disability and its association with socio-demographic background, psychosocial factors, risk of falls and body weight status among community-dwelling elderly aged 60 years and above in Mukim Batu (Gombak). A total of 258 respondents (males=123; females=135) aged 60 to 88 years old (mean age 66±6 years) were recruited through multi-stage sampling and house-to-house visit method. Data on socio-demographic background, psychosocial factors and fall risk were collected using face-to-face interview with administered questionnaires. Body weight and height were measured and body mass index (BMI) was calculated. Physical disability was measured using an eight-item Instrumental Activity Daily Living (IADL). Physical disability was defined as needing help in any one or more of these 8 items IADL activities. Fall risk was assessed using 21-item fall risk index (FRI-21). Majority of the respondents were Malays (65.9%), followed by Chinese (19.8%), and Indians (14.3%). The prevalence of present physical disability among the respondents was 58.1%, with 53.7% and 62.2% were male and female respectively. According to fall risk classification, almost 77% were classified as low risk, 9.3% were medium risk and 14% were high risk. Only 1.9% were categorised underweight, while 30.2% were normal and majority of the respondents (68.1%) were overweight and obese. Physical disability among the elderly was significantly associated with socio-demographic background [age group (χ^2=17.28, p<0.001), ethnicity (χ^2=6.05, p<0.05), educational level (χ^2=18.84, p<0.001), marital status (χ^2=19.88, p<0.001) and working status (χ^2=22.22, p<0.001)], psychosocial factors [visiting friends (χ^2=17.17, p<0.001), taking part in social programs (χ^2=24.62, p<0.001), perceived own health status (χ^2=10.33, p<0.01) and perceived health in relation to peers (χ^2=6.04, p<0.05)] and Fall risk (χ^2=23.74, p<0.001). However, physical disability was not significantly associated with body weight status [BMI (χ^2=0.02, p>0.05)]. In conclusion, high prevalence of physical disability found in this study proposed the need to develop programs related to the factors that are susceptible for intervention in order to provide a better quality of life among elderly.

A25 Pregnant women's knowledge, beliefs and attitudes regarding gestational weight gain in Kota Bharu, Kelantan

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The objective of this study is to describe the knowledge, beliefs and attitude of pregnant women towards gestational weight gain (GWG). Pregnant women in Kota Bharu, Kelantan, without diabetes mellitus and in the 2nd or 3rd trimester pregnancy were included in this study. They were given inform consent and complete self-administered questionnaire with the guidance of the researchers. The result showed that 44.3% of pregnant women did not achieve the recommended weight gain. 41.8% had achieved normal GWG rate while the rest (13.9%) gained weight above the recommended level. Chi-square test was used to see the association between the variables. The attitude of pregnant women showed a significant different (p=0.03) on GWG rate. Meanwhile, for both knowledge and belief did not show significant different on GWG with p=0.066 and p=0.115 respectively. The association

between socioeconomic status and GWG also did not show a significant different. However, pre-pregnancy BMI and GWG rate showed a significant different ($p<0.0001$) where pregnant women in underweight pre-pregnancy BMI tend to gain weight under recommendation during pregnancy. One-way ANOVA test was used to determine the relationship between nutrient intake and GWG rate but the result showed there was no significant different between this relationship. Although most of the result did not show any association but previous study showed there was a relationship between nutrient intake and GWG rate. However, there were limited study that had been done to describe the knowledge, beliefs and attitudes of pregnant women on GWG. Therefore, further study need to be done to determine whether knowledge, belief and attitude were one of the factors associated with GWG.

A26 Knowledge, attitude, and practice associated to Human Papillomavirus (HPV) Vaccination among Final Year Undergraduate students in Universiti Putra Malaysia, Serdang Selangor

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The study was design to determine the level of knowledge, attitude and practice related to HPV Vaccination. This cross-sectional study was carried out in Universiti Putra Malaysia Serdang, Selangor. Through simple random sampling, 131 respondents aged between 20-26 years were enrolled into this study using a pre-tested structured questionnaire. The average age of the respondents was 22.69±0.86. Of the total 131 respondents, 26% were male and 74% were female. Majority of the respondents were Malays respondents (68.7%), followed by Chinese respondents (20.6%), Indian respondents (6.9%) and others races with (3.8%). The average monthly family income of the respondents was RM 2,386.64±1,966.477. The findings revealed that more than half of the respondents (51.9%) had moderate levels of knowledge about HPV and HPV Vaccination with a mean knowledge score of 6.95 out of 18. As for attitudes, majority of the respondents (68.0%) act neutral towards HPV Vaccination with a mean score of 15.78 out of 22. In this study, only 8% of the respondents have been vaccinated while another 92% have not been vaccinated. Reasons for not taking the vaccine included: not aware of the vaccine (37.5%), vaccine is expensive (33.3%), concern about the side effect of the vaccine (19.2%), do not have time to take the vaccine (18.3%), vaccine is not easily available (12.5%) and afraid of needle (11.7%). The result showed that mean knowledge score for female respondents were significantly higher than male respondents with ($t= - 3.844$, $p <0.001$). Also, mean knowledge score among science stream respondents was significantly higher than arts stream respondents with ($t=2.453$, $p<0.05$). Besides, the mean attitude score for non-Malay was significantly higher than Malay respondents with ($t= -3.052$, $p<0.05$). In conclusion, although the respondents were knowledgeable and generally had neutral attitudes towards HPV Vaccination, however, the prevalence of HPV vaccine intake among this study population was very low. Hence, a more comprehensive and intensified program should be implemented to improve the intake of HPV Vaccination.

A27 Relationship between parental perception of neighbourhood environment and safety with physical activity among Malaysian school children

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This study aimed to determine parent's perception of neighbourhood environment and safety and how their perception was associated with children physical activity and weight status in Klang, Selangor. The questionnaires were distributed among 250 (9-12 years of age) primary school children and their parents. Physical Activity Questionnaire for Older Children (PAQ-C) was used to access children's physical activity levels, whereas data on parental perception of neighbourhood environment and safety were collected using Neighbourhood Environmental Walkability Scale (NEWS-A) questionnaire. In addition to the questionnaires, body weight, height, waist circumferences of children were measured to calculate body mass index and waist to height ratio. Among the environmental scale analyzed, land use mix-access was positively correlated with higher children physical activity ($r=0.173$, $p=0.006$). Meanwhile, traffic hazard were negatively correlated with children physical activity ($r=-0.152$, $p=0.016$). Other environmental scale such as residential density, land use mix diversity, presence of aesthetics features were not found to be significantly different across different ethnicity and SES status. While parents crime rate perception were similar across different SES status, however it was found to be associated with ethnicity with higher crime safety score among Chinese parents than Malay parents ($F=3.137$, $p<0.045$). Furthermore among the parental constrained behavior studied, it was discovered that defensive behavior score is significantly different across parent's educational level ($F=5.523$, $p=0.005$). At the same time, defensive behaviour was also found to be negatively correlated with children physical activity ($r=-0.024$, $p=0.143$). It can be concluded that how parents perceived neighbourhood environment (land use mix access and traffic hazard) and safety (defensive behaviour) may either facilitate or hinder children physical activity. While these concerns may not entirely justify the physical inactivity among children, a safe environment is crucial to increase opportunities for physical activity.

A28 A pilot study of Nutrition Practice Guideline in the Management of Childhood Obesity

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The Prevalence of childhood obesity is increasing worldwide and Malaysia not accepted. An effective intervention that encompasses of dietary management, physical activity modification and behavioural approach are required for management of obese children. Therefore, the objective of the intervention study was to compare changes in body mass index and body composition, feeding practices, family eating and activity habits between obese children receiving intervention based on the developed Nutrition Practice Guideline for the Management of Childhood Obesity (NPGMCO) and existing management of childhood obesity. A total of forty obese children aged 7–11 years old (21 boys and 19 girls) were randomly assigned to treatment (NPGMCO) or control (existing treatment of

childhood obesity management) for duration of six months. Subject's demographic, socio-economic characteristics and medical history were collected at baseline by a self-reported questionnaire completed by the parent. Anthropometric measurement, Child Feeding Questionnaire (CFQ) and Physical Activity Questionnaire for Older Children (PAQ-C) were collected at baseline and every visit, while, Family Eating and Activity Habits Questionnaire (FEAHQ) was obtained at baseline and last visit. The study was approved by Medical Research Ethics Committee of Universiti Putra Malaysia. All statistical analyses were done using SPSS v.20.0. BMI-for-age decreased significantly in treatment group(p=0.000) from baseline to six months as compared to control group(p=0.75).There was a significantly smaller weight increase in those in the treatment group (1.5±2.1, p=0.004) compared with control subjects (3.9±2.9, p=0.000) from baseline to 6 months. There were significant group-by-time interaction for weight (p=0.022), waist circumference (p=0.007), hip circumference (p=0.028), triceps (p=0.003) and pressure to eat (p=0.005). For FEAHQ, activity level of sedentary (p=0.027), eating style (p =0.046) and total score (p= 0.003) were significantly decreased, while in control group only eating related to hunger reduced (p=0.003). This pilot study has demonstrated that the NPGMCO is effective in managing childhood obesity.

A29 Prevalence of overweight and obesity among secondary school teachers in Malaysia.

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In the past decades, overweight and obesity problem has increased dramatically in Malaysian population. This study aims to determine the prevalence of overweight and obesity among secondary school teachers in Malaysia. The study included 228 teachers (male: 29.4%; female: 70.6%) from 26 selected secondary schools in Malaysia, with mean age was 37.4 ± 9.0 years. Majority of the teachers were Malays (83.3%), and 16.4% of teachers were non-Malays [Chinese (7.0%), Indian (7.0%) and Sabah and Sarawak *bumiputera* (2.6%)]. Their body weight and height were measured by trained researchers, and body mass index (BMI) was calculated. Overweight was defined as BMI 25.0kg/m^2 to 29.9kg/m^2 and obesity was defined as BMI > 30.0 kg/m^2. The prevalence of overweight and obesity among secondary school teachers was 34.6% (95% CI: 28.8-41.0) and 17.1% (95% CI: 12.7-22.6), respectively. About two in five of the male teachers were overweight [43.3% (95% CI: 32.1-55.2)] and 19.4% (95% CI: 11.6-30.6) were obese, whereas about one - third of the female teachers [31.1% (95% CI: 24.4-38.6)] were overweight and 16.2% (95% CI: 11.2-22.7) were obese. In comparison by ethnic groups, the highest prevalence of overweight teachers was among the Malays (84.8%) as compared to non-Malays (15.2%). As for obese teachers, all of them were Malays. In short, the prevalence of overweight and obesity was high among teachers whereby half of them were overweight and obese. Thus, there is an urgent need to have a weight management program for teachers.

A30 An intervention study on the effectiveness of calorie labeling on adolescents' energy intake from the school canteen

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This intervention study sought to determine the effectiveness of calorie labeling to help the school-adolescents to purchase healthier foods from the school canteen. Besides, factors such as socio-demographic background, individual factors, environmental factors,

nutrition knowledge, and intention to use calorie labeling were also determined among 120 school-adolescents aged 16 years from two schools in Bandar Tun Razak, Kuala Lumpur. These subjects were composed of two groups, where 60 subjects from one of the schools were exposed to calorie labeling at the school canteen (intervention group) and the other 60 subjects from another school were not exposed to calorie labeling (control group). Data from this intervention study were collected two weeks before calorie labeling intervention (baseline) and after one month of intervention (final). A self-administered questionnaire consisted of data on socio-demography, included 54 items of food purchase recall, total calories purchased and factors associated with calorie labeling utilization. There were no significant differences on subjects' socio-demographic characteristics between the two groups. There were also no significant differences during the baseline mean calorie purchased (403.3±302 kcal/day) and final mean calorie purchased (458.4±240.9 kcal/ day) among the control group. Conversely, the intervention with calorie labeling showed significant findings as the mean calorie purchased at the school canteen decreased from 501.8±316.3 kcal/day (baseline) to 371±247.1 kcal/day (final) after one month of intervention. In the intervention group, individual factors (self-preference, habitual ordering, degree of hunger), environmental factors (foods and beverages price, convenience, confusion of calorie purchased) and nutrition knowledge were significantly and negatively correlated with reduced total calorie purchased ($p<0.05$). These factors suggested that the intervention increased subjects' awareness to use calorie labeling when purchasing foods at the school canteen. In fact, calorie labeling may lead to significantly purchase of lower calorie foods (healthier foods) at the school canteen among Malaysian adolescents.

A31 Association of Quality of life and BMI among Malay primary school children in Ulu Kinta, Perak

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The present study was conducted to assess quality of life (QoL) among Malay primary school children in Ulu Kinta district, Perak, using parent-reported and child-reported QoL questionnaire. Health-related Quality of life was measured by using Pediatric Quality of Life Inventory version of 4.0 which comprises four basic scales (physical, emotional, social and school functioning). The total of these basic scales were then derived into physical and psychosocial health summary scores. A total of 54 boys and 82 girls from four primary schools in Ulu Kinta District, who fulfilled the inclusion criteria were recruited for this study. The subjects were categorized into groups that are normal weight (64.7%), overweight (16.9%) and obese (18.4%) according to BMI for age. This study found that, the highest total mean score for child self-reported were recorded by normal weight group (88.12±7.40), followed by the overweight group (78.78±7.95) and the obese group had the lowest score (66.65±12.14). The same pattern was observed for parent-reported, the highest score was reported by parents of normal weight children (87.02±9.34), followed by parents of overweight children(76.23±12.28) and obese group (71.74±11.4).There was a significant difference ($p<0.001$) in QoL mean score of normal weight, overweight and obese children for all domains in both child and parent reported. Interestingly, the results showed no significant different ($p>0.05$) for all domain between child-reported and parent-reported. There was a weak negative correlation between BMI for age and child-self reported QoL ($r=-0.55$, $p<0.001$ for total score) and also between BMI for age and parent-reported QoL ($r=-0.48$, $p<0.001$ for total score). This study concludes that higher BMI associated with lower quality of life reported by both child and parent among school children in Ulu Kinta District, Perak.

A32 Frailty and nutritional status among older adults in Perak and Kelantan

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Frailty is associated with nutritional status in older adults. The aim of this study was to determine the frailty and nutritional status among older adults in Perak and Kelantan. A cross sectional study was conducted involving 343 older adults aged 60 years and above from Perak and Kelantan were recruited through multistage random sampling. Frailty status was assessed using Fried et al. (2001) definition of frailty based on shrinking, slowness, weakness, self-reported exhaustion, and low physical activity. Food intake was assessed using Diet History Questionnaire (DHQ). Anthropometric measurements of weight, height, calf circumference, hip measurement and mid-upper arm circumference were taken. The prevalence of frailty was 23.0% among the subjects. The prevalence of frailty in women (25.1%) was higher than men (20.8%). The prevalence of pre-frail (66.5%) and frail (35.7%) was higher among overweight and underweight subjects respectively. The mean intake of energy and certain nutrients such as protein and niacin were lower among frail subjects. In conclusion, frailty affected at least one quarter of the older adults in this study. There is a need to further investigate the role of lifestyle and dietary pattern with frailty for formulation of prevention strategies.

A33 Relationship between knowledge, attitudes, and behaviours on hydration and hydration status of national weight category sports athletes

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This cross sectional study aimed to determine the relationship between knowledge, attitudes, behaviours on hydration with hydration status among weight category sports athletes. A total of 60 athletes aged 16-35 years were recruited. Self-administered questionnaires consisting of socio-demographic, knowledge, attitudes and behaviours were given to athletes. Urine specific gravity (USG) and pre- and post-training body weight were measured to determine the hydration status. Each question for knowledge and behaviour was given a maximum score of 1. Attitude question contained 5-point Likert scale was given minimum and maximum score of 1 and 5, respectively. The mean percentage score for knowledge, attitudes, and behaviours were (68.04±13.97%), (75.06±8.17%), and (75.78±13.79%), respectively. Most athletes were significantly dehydrated with mean value was 1.027±0.01 g/mL, while the mean changes of body weight was 1.55±1.01%. Knowledge score (r= 0.306, p= 0.018) was significantly related with body weight changes (%) but not with urine specific gravity (r= 0.156, p= 0.233). Meanwhile, knowledge score (r= 0.459, p= 0.0001) was significantly related with attitude scores. Knowledge score for Karate was significantly different with other type of sports (F= 5.202, p= 0.001), the knowledge score was significantly different for age (F= 3.793, p= 0.015), and university athletes had higher knowledge score and significantly different from secondary school athletes (F= 3.319, p= 0.043). There was a significant difference for behaviours score between athletes aged 16-20 with athletes aged 21-25 (F= 3.382, p= 0.024). Hydration status of mean changes of body weight (%) for male was higher and significantly different compared to female (t=

3.187, p= 0.002), while type of sports (F= 12.096, p= 0.0001) were significantly different for hydration status of mean changes of body weight (%). Findings suggest that athletes have the knowledge and behaviours on hydration. However, athletes did not portray good hydration behaviours as indicated by the hydration assessment.

A34 The obesogenic environment and its relationship with nutritional status and physical activity level among secondary school students in Kuala Lumpur

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This cross-sectional study aimed to determine the relationship between the obesogenic environment with nutritional status and physical activity level among adolescents aged 13 to 14 years old. A total of 244 participants were recruited from three secondary schools located in the Keramat Zone of Kuala Lumpur, namely Semarak, Setapak and Setiawangsa. Assessment of the environment was conducted by observation using structured observation list, to determine the availability and accessibility of food choices and physical activity facilities around the schools and communities where the adolescents live in. Body weight, height, body fat percentage and waist circumference were measured and body mass index (BMI) was calculated. Dietary intake was assessed by 3-day food record while physical activity level was assessed by the Physical Activity Questionnaire for Adolescents (PAQ-A). Mean BMI was not significantly different (p=0.547) between areas (Semarak 20.7 ± 5.8 kg/m^2; Setapak 21.3 ± 5.9 kg/m^2; Setiawangsa 21.3 ± 5.1 kg/m^2). Anthropometric variables did not differ between the sexes, except for body fat percentage ($p<0.05$). Boys had slightly but significantly higher ($p<0.05$) physical activity level (1.9 ± 0.3) compared to girls (1.8 ± 0.4). Total facilities for physical activity in schools and communities for each area were Semarak 23, Setapak 19 and Setiawangsa 9. Many restaurants, roadside stalls and vendors within half a kilometer of the schools and communities were selling unhealthy foods (74%) compared to healthy foods (6%). Correlation tests showed significant relationship between available food options with energy intake ($r= -0.14$, $p<0.05$), while no significant correlation was found between physical activity facilities and physical activity level. We conclude that the obesogenic environment in the areas studied influenced energy intake but not physical activity of the adolescents. This suggests that nutrition interventions focusing on healthier food choices when eating out may benefit secondary school students

A35 The measurement of sedentary levels and patterns using the activPAL™ professional physical activity monitor among obese children aged 9-11 years old: the preliminary findings.

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The aim of this study was to determine the sedentary patterns and level of obese children aged 9-11 years old using the ActivPAL™ and to differentiate sedentary levels and patterns between weekdays and weekends. A total of 20 obese children with median age of 10.1 years (interquartile range [IQR] 9.3, 11.3 y) and BMI 27.1 kg/m^2 (IQR 22.4, 32.5 kg/m^2) participated in this study. The use of ActivPal™ as the measurement tool in this study has been validated by previous study. The activPal was attached on the midpoint of the

anterior aspect of the thigh using the PALstickies (a double-sided hydrogel adhesive pad) and covered with an elastic tube bandage to ensure the device stayed in place. Respondents were instructed to wear the device for a total of 7 days, and must be removed only during bathing or any water-related activity as it is not waterproof. Only respondents that provided at least 4 days (including 1 weekend day) included in this study. All the data were presented in the form of median and interquartile range (IQR). The median of total hours spent per day during sitting/lying was 18.3 hours (IQR 14, 22 h), standing 3.9 hours (IQR 1.7, 6.7 h), stepping 1.8 hours (IQR 0.1, 3.5 h) and number of steps per day 8222 (IQR 533, 15483). However, results show that there were no significant differences in sedentary levels and patterns during weekdays and weekend among obese children ($p > 0.05$). As child obesity has been widely known as a major concern among health practitioners these days, it is necessary to know their sedentary patterns and levels to create a better understanding on their lifestyles.

A36 Association between quality of life and socioeconomic status among primary school of children in Gombak, Selangor

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The objective of this study was to assess the association between quality of life (QoL) and socioeconomic status (SES) among primary school children in Gombak, Selangor using the parent and child proxy quality of life questionnaire. Health-related quality of life was measured by using Pediatric Quality of Life Inventory version of 4.0. The questionnaire was distributed to children aged 10-11 years old. The questionnaire consists of 23 items that divided into two subdomains, physical and psychosocial scales (emotional, social and school functioning). A total of 71 boys and 79 girls school children from four primary schools in Gombak, Selangor were selected based on the inclusion criteria. The study sample was characterized by socioeconomic status and BMI for age. Majority of the subjects were Malays (67.3%), followed by Chinese (20.7%), and Indians (12%). The BMI for age was compared between boys and girls showed that there was no significant difference ($p> 0.05$) between sex. For child self-report, the lowest SES group had the highest mean total score (76.4±10.6), then followed by moderate SES group (76.3± 14.1) and higher SES Group (70.7± 12.9). For parent report, the moderate SES group (67.9±15.0) showed the highest mean total score followed by lowest SES group (66.9±14.4) and the higher SES group (65.9±16.4). There was no significant difference ($p>0.05$) in all domains of QoL mean score between SES group except for emotional domain in parent-proxy QoL reported. The mean score for all domains by child self-report was higher than parent reported and there were significant different ($p<0.05$) between child self-report and parent reported except for emotional domain. However, this study showed no significant correlation between QoL and SES. This study concludes that, there are no association between quality of life among school children in Gombak and socioeconomic status.

A37 The relationship of lifestyle factors and body weight status among undergraduate students in Universiti Putra Malaysia.

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A cross-sectional study was carried out to determine the association between lifestyle factors and body weight status among 19-24 years old young adults (n=140) in Universiti Putra

Malaysia. Respondents were measured for weight, height, waist circumference and body fat percentage and interviewed for demographic, socio-economic, lifestyle factors and dietary intake. Based on BMI classification, 6.4% and 11.4% of the respondents were underweight and overweight. For waist circumference, 88.6% were categorized as normal. Body fat percentage classification revealed that 46.4% of the respondents have high percentage of body fat. For sleep pattern, 47.1% had optimal sleep quality and 34.3% slept for 6 to 7 hours per night. In terms of energy intake of the respondents, 87.8% consumed energy as recommended by Malaysia's Recommended Nutrient Intakes (RNI). For physical activity, 60.0% were classified as practice moderate intensity physical activity. Based on perceived stress scale, 95.0% were experience moderate stress. A significant association was found between dietary intake (r=0.352, p=0.041) with body mass index. Sleep quality (r= -0.167, p=0.049) was found to have an inverse association with waist circumference. Although, dietary intake (r=0.318, p=0.035) and stress (r=0.177, p=0.036) have direct association with percentage of body fat, however, sleep quantity (r= -0.205, p=0.015) was found to have an inverse association with percentage of body fat. In conclusion, this sample of undergraduate students have several modifiable risk factors for chronic diseases such as poor sleep quality and deficient of sleep quantity, high fat diet and moderate stress. Health promotion campaign on lifestyle management should be organized for undergraduate students to improve their health and nutritional status.

A38 Factors, coping strategies related to food insecurity and nutritional status among Orang Asli women in Gombak, Selangor

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Food insecurity is becoming a common problem among the low-income households and has been shown to contribute to poor nutritional outcomes. Households adopted coping strategies related to food insecurity to minimize the impact of food insecurity. This study was conducted to determine the factors, coping strategies related to food insecurity and nutritional status among Orang Asli in Batu 12 Gombak, Selangor. The respondents were interviewed to obtain information on demographic and socio-economic backgrounds, food security status (Radimer/Cornell hunger and food insecurity instrument), coping strategies related to food insecurity (Malaysian Coping Strategy Instrument), and dietary intake (24 hour dietary recalls). Weight, height and waist circumference (WC) were measured. A total of 92 respondents aged 19 to 59 years were involved in this study. The findings indicated that majority of the households (88%) reported of food insecurity (48.9% households food insecure, 21.7% individuals food insecure and 17.4% child hunger). Factors that contribute to food insecurity are low education level, low income, high number of children and increase in household size. Most of the households adopted food related coping strategies such as consuming whatever food is available around the house (69.1%), and using less expensive food (63.0%) as well as non-food related coping strategies such as being thrifty in using money (84.0%), and planning for expenditure (84.0%). Besides that, households also adopted others coping strategies such as catching fish from rivers and depending on forest sources for food. Majority of the respondents' macro and micronutrient intake did not meet the Recommended Nutrient Intakes (RNI). The mean BMI was slightly higher among women from food secure households (27.48 kg/m2), household food insecure (27.54 kg/m2) and individual food-insecure (27.82 kg/m2) than child hunger (24.85 kg/m2) but not significant. In conclusion, food insecurity is a major public health problem among the Orang Asli. Intervention aimed at improving the nutritional status of indigenous people should be carried out.

A39 Dietary acculturation and anthropometric measurements among orang asli adults in Gombak, Selangor

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Dietary acculturation is the process that occurs when the minority group adopt the eating patterns or food choices of the majority groups in their new environment. Dietary acculturation can results in both healthful and less healthful dietary changes. A cross-sectional study was carried out to determine the association between dietary acculturation and anthropometric measurements among Orang Asli in Gombak, Selangor. The information on demographic and socio-economic characteristics, general acculturation and dietary acculturation were collected using interview administered questionnaire. Weight, height, body fat percentage and waist circumference were assessed using TANITA weighing scale, SECA body meter, OMRON body fat analyzer and measuring tape, respectively. Data were analyzed using the Statistical Package for Social Sciences (SPSS), version 21.0. The findings indicated that 85 respondents involved in this study and most (62.4%) of the respondents from Senoi tribe. The mean age of respondents was 38.72±11.36 years and the mean household income was RM1401±926.25. General acculturation indicated that 67% of respondents were bicultural. According to total dietary acculturation score, most respondents (47.1%) practice eating both modern food and traditional food. Western dietary acculturation shows the highest score (68.95%) among other types of dietary acculturation. Approximately 56.5% respondents were overweight and obesity with the mean 26.49±6.03kg/m^2. The mean for body fat percentage was 29.88±8.88% whereas waist circumference was 82.20±15.24cm. The age ($r=-0.362$, $p<0.01$) and years of education ($r=0.365$, $p<0.01$) were found to have significant correlation with dietary acculturation. General acculturation was found to have positive correlation with Western dietary acculturation ($x^2=12.938$, $p<0.05$). Indian dietary acculturation shows significant correlation with BMI ($r=0.240$, $p<0.05$) and body fat percentage ($r=0.245$, $p<0.05$). In conclusion, the respondents in this study were practising bicultural and western dietary acculturation that high intake of saturated fat, low fiber and refined sugar. Therefore, campaigns and educational programmes regarding healthy food choices are needed among them to improve their nutritional status.

A40 Development of the Malaysian growth reference (5-18 years) using national survey data and comparison with WHO Growth Reference

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WHO Growth Reference charts are indispensable tools for monitoring the physical growth and screening for early malnutrition in schoolchildren. Data from the Third National Health and Morbidity Survey (NHMS III), 2006, were used to develop growth charts for Malaysian children (MyGC). Our aim is to compare MyGC's weight-for-age, height-for-age

and BMI-for-age percentile curves with WHO Growth Reference for schoolchildren age 5-18 years. Weight and height measurements from NHMS III were used to construct gender-specific weight-for-age, height-for-age and BMI-for-age charts using LMS ChartMaker Pro software. The 3rd, 15th, 50th, 85th and 97th percentiles of MyGC were plotted against the corresponding percentiles on the WHO Growth Reference. For both boys and girls, all weight-for age percentiles were lower than WHO curves except for the 97th percentile. While with respect to height-for-age percentile curves, the MyGC median curve was lower by an average of 5cm. For BMI-for-age, MyGC 97th percentile curve was much higher than the corresponding WHO percentiles, the difference varying between 1.0 to 5.0kg/m^2. The MyGC 3rd percentile on the other hand was lower by between 1.0 to 1.5 kg/m. There were differences between MyGC and WHO child growth reference for both boys and girls. More Malaysian schoolchildren would be reported as having the problem of underweight and stunted by using the WHO Reference weight-for-age and height for-age. Based on WHO BMI-for-age more children would also be classified as underweight and obese. Further studies should be conducted, specifically designed for assessing the growth of Malaysian children to confirm the current findings.

A41 The relationship between nutrition knowledge, lifestyle and BMI among adolescents in Hulu Langat District.

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The objective of this study was to determine the association between nutrition knowledge, lifestyle and BMI among adolescents in Hulu Langat District. A self-administered questionnaire comprising Food and Nutrition Knowledge, Attitude, Practice Questionnaire, Eating Behavior Questionnaire (EBQ) and Physical Activity Questionnaire for Adolescents (PAQ-A) was used to gather the data. Respondent's weight, height, and waist circumference (WC) were measured using appropriate instruments and standard procedures. Body weight status was determined by categorizing their BMI-for-age z-score (BAZ) using WHO 2007 growth reference .A total of 435 adolescent (201 males and 231 females) aged 13 to 16 years old participated in this study. Majority of the respondents were Malay (77.5%), followed by Chinese (13.6%), Indian (7.4%) and others (1.5%).The mean body weight, height, BMI and waist circumference were 52.31±14.99kg, 1.56±8.53m, 21.28±5.11kg/m^2 and 74.95±30.98cm, respectively. Among the respondents, 32.4% were overweight and obese. The prevalence of abdominal obesity was 23.2%. The mean nutrition knowledge score was 16.29±3.75. More than half of the respondent skipped at least one meal (69.7%). Breakfast was the most frequently skipped meal (53.3%) followed by lunch (34.9%) and dinner (28.3%). The mean score for physical activity was 1.25±0.493. Significant correlation were found between BMI with household income ($r=0.145$, $p<0.01$) and nutrition knowledge score ($r=0.167$, $p<0.01$). Sex ($x^2=7.13$, $p<0.05$) were significantly associated with BMI. Those eating breakfast daily had significantly lower BMI than those who skipped breakfast ($t=-2.13$, $p<0.05$). No significant relationship was observed between BMI with physical activity level, fast food consumption and meal skipping. In conclusion, this finding showed higher prevalence of obesity and overweight among the adolescents and socio-demographic, nutrition knowledge and breakfast skipping were associated with BMI. Therefore, healthy eating habits, particularly daily breakfast consumption should be encouraged among the adolescents, for maintaining good health throughout life as well as in prevention of overweight and obesity during these critical growth years.

A42 The validity and reliability of pregnancy physical activity questionnaire Malay version (PPAQ-M)

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The objective of the study was to validate and testing the reliability of pregnancy physical activity questionnaire in Malay version (PPAQ-M). The original of PPAQ has been authorised to use in this study. In order to use for Malay population, the original PPAQ has been translated into Bahasa Malaysia version and also back-translated by using specific procedures of translation of the questionnaire. Finally, after the translation process PPAQ-M was produced and used to assess physical activity of woman during pregnancy among Malays. The PPAQ-M was distributed to 60 pregnant women who visited Kota Bharu health clinics for antenatal check-up. It consists of 32 items of activities which were categorised by types and intensity. The types of activity involved household or caregiving and occupational activities and sports or exercise whereas the intensity of the activities was divided into sedentary, light, moderate and vigorous-activity. Intraclass correlation coefficient (ICC) analysis was used to assess test-retest reliability of the PPAQ-M. Spearman rho correlation coefficient between total activity value derived from PPAQ-M and step counts which obtained from pedometer was used to determine the validity of PPAQ-M. ICC value was analysed for each intensity and type of activity. ICC value was 0.85 (95% CI 0.75-0.91) for total activity, 0.89 for sedentary, 0.41 for light, 0.79 for moderate and 0.70 for vigorous activity. As for type of activity, occupational activity had the highest ICC value (0.95) followed by household or caregiving (0.85) and sports or exercise (0.36). Spearman rho correlation coefficient showed there was significantly moderate and positive correlation between total activity of PPAQ-M with step counts ($\rho = 0.467$, $p = 0.01$). The findings showed the PPAQ Malay version was within acceptable validity and reliability. Therefore it is valid and reliable as an instrument to assess physical activity among Malay pregnant women in Malaysia.

A43 An Evaluation of Printed Health Educational Materials: A strategy for improving dissemination of health messages to public.

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Many printed health educational materials were not tested for readability and suitability of materials and these resulting barriers to the public to understand on health messages. The purpose of this study was to evaluate common printed health materials for readability and suitability for public in rural areas. The validated questionnaire, *Tool to Evaluate Material Used in Patient Education (TEMPtEd)* was used to test reading level and suitability assessment scores. *TEMPtEd* consisted of five subscales including content, motivating principles, literacy, layout and typography, and graphics. One component in subscale literacy used *Simple Measure of Gobbledygook (SMOG)* test to determine the readability of the materials. Based on *TEMPtEd*, reading level scores are categorized into 4 groups which are "Good" (score 3), "Satisfied (score 2), "Less Satisfied" (score 1) and "Unsatisfied" (score 0). While total score of *TEMPtEd*, determines suitability of materials and also categorized to 4 groups which are "Excellent" (score 57-63), "Above average" (score 51-56), "Average"

(score 45-50) and "Unsuitable" (score 0-44). Two pamphlets published by Ministry of Health Malaysia, entitled *"Senaman"* and *"Kurangkan Gula"* were reviewed for this study. The data was collected from several areas in Kuala Langat, Selangor. A total of 139 volunteered adults (39 males and 100 females) aged between 18-59 years old were involved in this study. The results showed that both pamphlets were at unsatisfied reading level (pamphlet *"Senaman"*= index score 14, pamphlet *"Kurangkan Gula"*=index score 17). While for the suitability of pamphlets, the results showed both pamphlets were at unsuitable category (pamphlet *"Senaman"*= 44.95 ± 4.69%, pamphlet *"Kurangkan Gula"*= 43.13± 4.56%). In conclusion, the study showed there is a need to improve the quality of the pamphlets to ensure public understands health messages through printed educational materials.

A44 Normal weight and overweight Malaysian Army personnel in Kuala Lumpur: comparison of nutritional status, dietary and lifestyle Practices

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Obesity is an increasingly prevalent metabolic disorder that occur not only among the general population but also military population as well. This study aimed to assess the selected nutritional status indicators, dietary and lifestyle practice between normal weight and overweight Malaysian Army (MA) personnel. A cross sectional study was conducted on 378 male military personnel aged 20-48 years at two Malaysian Army bases in Kuala Lumpur between November and December 2012. Antropometric measurements were taken and body fat percentage of subjects were measured using bioimpedance method (Tanita TBF-300A). A set of self-administered questionnaires such as sociodemographic, dietary and lifestyle pratice were used. Results showed that 54.8% subjects have normal weight while 42.1% were overweight. The mean age and selected physical characteristics of normal and overweight subjects were age (27.7 ± 5.0 years, 31.2 ± 5.5 years), body weight (64.8 ± 6.5 kg, 82.2 ± 9.7 kg), height (1.71 ± 0.06 m, 1.70 ± 0.05 m), body mass index (BMI) (22.1 ± 1.8 kg/m^2, 28.5 ± 3.0 $kg/m^{2)}$, waist circumference (WC) (81.6 ± 6.7 cm, 95.3 ± 7.4 cm) and body fat (19.8 ± 4.3%, 29.0 ± 4.8%) respectively. There were significant differences for age and all physical characteristics between the two groups ($p<0.01$). Some 81% of the subjects had WC value ≥ 90 cm and are considered to be at greater risk for cardiovascular and diabetes disease. Overweight subjects were found to likely skip dinner compared to normal weight subjects ($x^2=0.188$, $p<0.05$). However no significant assosiation between weight status with breakfast ($x^2=0.172$, $p>0.05$) and lunch ($x^2=0.153$, $p>0.05$) intakes. Even though more normal weight subjects (67.1%) were smoking compared to overweight subjects (63.3%), no significant association was observed between weight and smoking status ($x^2=0.040$, $p<0.05$). It was noted that 23.3% overweight subjects exercised everyday for 20 minutes while a slightly higher percentage of 29.5% for normal-weight subjects ($x^2=0.155$, $p>0.05$). These baseline data are useful for future monitoring and health promotion planning to prevent obesity in MA personnels.

A45 Overweight and obesity among children aged 7-9 years in Saudi Arabia: prevalence and its associated factors with dietary intake

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The prevalence of obesity had increased among children in Saudi Arabia. This cross sectional study aimed to determine the prevalence of overweight and obesity and its associated factors among children aged 7-9 years in Makkah Province, Saudi Arabia. A total of 240 primary school students (120 boys and 120 girls) aged 7-9 years were recruited through randomised cluster sampling. Self-administered questionnaires were distributed to respondents' guardian to obtain information on socio demographic background and dietary intake. The dietary intake was recorded using two day 24-hour dietary recall. Body weight and height were measured to determine BMI for age. Mean of BMI of the respondents were 17.17±3.24 kgm^{-2}, weight 24.75 ±6.95 kg and height 1.19 ±0.08 m. Majority of the respondents (67.1%) were classified as normal, 16.7% overweight, 13.3% obese and 2.9% thinness. Mean of total energy, carbohydrate, fat and protein intake were 1239±193 kcal, 181.09±26.42g, 38.05±8.88g, 40.78±6.10g respectively. The mean total energy (t=3.41, p=0.001) and carbohydrate (t=4.48, p=0.000) were significantly higher among boys as compared to girls. There were significant correlations between BMI-for-age with total energy dietary intake (r=0.549, p=0.000), carbohydrate (r=0.508, p=0.00), fat(r=0.408, p=0.00) and protein(r=0.183, p=0.005) respectively. There was a significant difference between BMI-for-age with total energy intake (F=44.23, p=0.000), carbohydrate (F=27.90, p=0.000), fat (F=25.72, p=0.000) and protein intake (F=342.37, p=0.000). The increasing prevalence of overweight and obesity among children in Saudi Arabia suggests a need for proactive planning and implementation of intervention program leading to healthy eating and active lifestyle.

A46 Prevalence of Malnutrition Among Newly Enrolled Students of Primary School and its Associated Factors in Kota Bharu, Kelantan

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The objective of the study was to determine the prevalence of malnutrition among Standard One who enrolled primary schools in Kota Bharu. Prevalence of malnutrition has been identified by using two different reference; NCHS/WHO (1983) and New Child Growth (2007) references. Apart from the determination of malnutrition, associated factors of malnutrition among Standard One children also was assessed. A list of all Standard One primary schools (n=16) in Kota Bharu was included in the sampling frame. Weight, height and mid upper arm circumference were measured on 1,436 children at the second week on enrolment which was in the second week of January 2013. In order to determine the associated factors that might contribute to the malnutrition, a piloted questionnaires also were administered to their parents. Two anthropometric calculators were used in to identify the prevalence of malnutrition; WHO AnthroPlus (WHO, 2007) and Epinut (CDC, 2000). In general, the results showed 55.4% of the respondents were females and 44.6% were males, majority Malays and only 5.2% had their household incomes below than RM500 per month.

In term of income per month, almost 57.0% earned more than RM1000.00 per month with majority (54.0%) consisted of six to ten household members. In term of breastfeeding, 94.0% had ever breastfed and 70.0% of mothers reported that exclusively breastfed their children. Only 8.0% ever received food assistance such as food basket or Milk powder from Ministry of Health. In term of prevalence, based on NCHS/WHO (1983), 17.8% were underweight, however based on WHO (2007),12.7% were underweight, respectively. Indicator of height for age showed 10.7% were stunting (WHO, 2007) and 12.7% stunting based on old version of reference. Wasting, on the other hand was 11.7% (NCHS/WHO, 1983), however, new WHO reference does not able to indicate wasting. BMI-for-age based on new WHO, 79.7% were normal, 0.7% were severe thinness, 5.1% thinness, 6.6% overweight and 7.9% were obese. Out of respondents, 13.5% were having low mid upper arm circumference. Monthly income, household size, birthweight below than 2.5kg were associated significantly with stunting. On the other hand, ethnicity, duration of breastfeeding and ever received food assistance were found to be significantly associated with wasting.

A47 Diet and physical activity among pregnant women in Selangor

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Adopting a healthy eating habit and physical activity is crucial to ensure a good pregnancy outcome. This study aimed to assess dietary intake and physical activity level of pregnant women. 101 pregnant women from six government Health Centres in Selangor were involved. Three 24-hour dietary recalls were used to assess their dietary intake pattern and the Pregnancy Physical Activity Questionnaire (PPAQ) for their physical activity level. The lowest mean energy intake daily was 1542.2 kcal ± 481.1 (for age group 30-45 years in their second trimester) and the highest 1767.1 kcal ± 496.9 (for age group 20-29 years in their second trimester). The lowest mean protein intake daily was 67.6 g ±31.2 (for age group 30-45 years in their second trimester) and the highest was 74.3 g ±21.8 (for age group 30-45 years in their third trimester). The median for lowest fat intake daily was 58.0 g (25^{th} percentile 48.5; 75^{th} percentile 88.8) (for age group 30-45 years in their third trimester) and the highest was 74.0 g (25^{th} percentile 54.0; 75^{th} percentile 90.0) (for age group 20-29 in their third trimester respectively). Only their protein intake met the Malaysian RNI. Pregnant women in this study generally have low physical activity level. The median for total activity was 164.69 MET-h·wk^{-1}. The highest energy expenditure was light physical activity within range of 1.5 to 2.9 METs. The highest energy expenditure of 82.29 MET-h·wk^{-1} was for household physical activities. These findings showed that pregnant women in this study met the daily requirements for protein but not for energy, calcium and iron. They are involved only in light physical activities that are related to their household chores and occupation. Pregnant women should be made aware on the importance of doing moderate level physical activities for their health benefit.

A48 Body image perception and nutritional status among female adolescents in Klang, Selangor

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Body image concerns are common among adolescents as they undergo rapid physical growth and body shape changes. A cross-sectional study was conducted to determine the association between perception of body image and nutritional status among female adolescent in Klang, Selangor. A total of 177 female respondents, aged between 13 to 17 years, from three secondary schools in Klang were included in this study. Eating behavior and body image perception were measured by using Eating Attitude Test-26 (EAT-26) and Contour Drawing Rating Scale (CDRS), respectively. The weights and heights of all subjects were measured and their Body Mass Index (BMI) was determined. The mean BMI-for-age among the respondents was 19.9 ± 3.39. A total of 76.8% of the respondents reported of having a normal BMI, while 15.3% were underweight and 7.95% were overweight and obese. Mean eating behaviour score was 19.23 ± 10.26, with 30.2% of the respondents were at risk for eating disorders. For body image perception, the mean discrepancy score was 1.43 ± 0.67, with 79.9% of the respondents were dissatisfied with their current body image, where 61% from those dissatisfied, have desire to be thinner. A significant association were found between eating behaviour ($r= 0.13$, $p<0.05$) and body image ($r= 0.18$, $p<0.05$) with BMI. Respondents with higher eating behaviour scores and body image discrepancy scores were more likely to have higher BMI. The results from this study shows that there is a need for body image intervention program as it leads to unhealthy eating habits and disordered eating behaviour among adolescents.

A49 Development and evaluation on the acceptability of a nutrition educational module for overweight and obese adolescents

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This study was conducted to develop and evaluate the acceptability of a nutrition education module for overweight and obese adolescents. This study had three phases: Phase 1 was the needs assessment among 44 adolescents conducted through four rounds of small group discussion; Phase 2 was the development and content validation of the module; and Phase 3 was the evaluation on the acceptability of the module among 50 individuals including adolescents, health professionals, teachers and parents. The module covered five topics: (1) assessment of body status; (2) basic information on obesity; (3) healthy menu planning; (3) healthy food choices; and (5) reading food labels. The Tool To Evaluate Material Used In Patient Education (TEMPtEd) questionnaire was self-administered in Phase 3 to evaluate the readability and acceptability of this module. This study showed that mean scores for adolescents and adults, in terms of module content were, respectively, 16.9±2.9 and 18.4 ± 2.1 out of 21, motivating principle 5.0±0.9 and 4.3 ± 1.2 out of 6, literacy 7.4±1.2 and 7.5 ±1.4 out of 12, layout and typography 12.6±2.0 and 13.1 ± 2.1 out of 15, and graphics

7.0±1.6 and 8.0 ± 1.3 out of 9. Overall, the adolescents found the module moderately acceptable (48.9±6.3) while adults had good acceptance towards the module (51.4 ± 5.7). In conclusion, the nutrition education module developed is suitable for use in health education programs related to childhood obesity. Nonetheless, further improvements on the content and design of the module are needed prior to implementation in larger scale interventions.

A50 Factors associated with physical activity level among 13-14 year old students from a selected school in Ledang, Johor.

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This study determined the factors associated with physical activity level among 287 form two students, from one randomly selected secondary school in the district of Ledang, Johor. Data were collected using a self-administered questionnaire consisting of four sections on sociodemographic background, Physical Activity Questionnaire for Children (PAQ-C), Eating Attitudes Test 26 (EAT-26), and Perceived Physical Activity Self-Efficacy Scale. Body weight, height and waist circumference of the respondents were measured and BMI was determined. In this study, 56.1% of the respondents were males and 43.9% females; 88.9% were Malays and 11.1% Chinese; largely from families with total income more than RM2000 per month (mean family income=RM2483.56±2617.38) and relatively large household size (mean household size=6.19±1.76 persons). Overall mean age for the respondents was 13.89±3.76 years. More than half of the respondents' fathers (62.0%) and mothers (67.2%) had attained secondary school education. The prevalence of normal weight was 57.5%, overweight 17.1%, obesity 18.5%, and thinness 5.2%, severe thinness 1.7%. Mean physical activity score for males was 2.79±0.51 while for female it was 2.17±0.52 with 40.1% categorized in the low, 55.7% moderate, and 4.2% in the high physical activity level. The prevalence of disordered eating was 31.4% (male: 53%; female: 29.4%). The mean perceived physical activity self-efficacy score is 48.32±11.73. Significant relationships were found between sex (χ^2=75.465, p=0.000) and perceived physical activity self-efficacy (r=0.507, p=0.000) with physical activity level. Physical activity intervention should include components on physical activity self-efficacy tailored to the different sexes of the adolescents.

A51 Factors related with duration of any breastfeeding among Malay mothers in Hulu Langat district.

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This cross-sectional study aimed to determine the factors related with duration of any breastfeeding among Malay mothers in Hulu Langat district. Duration of any breastfeeding is defined as length of time for any breastfeeding (BF) includes the starting of BF, period

of complementary food and until weaning. A total of 60 mothers who attended the selected BF support centre and had a child aged 12 to 36 months regardless of BF status were participated in this study. The information on mothers' socio-demographic background (obstetrics), nutritional status of mothers, BF practices and environmental factors were obtained by pre-tested questionnaires. The mothers need to recall the pre-pregnancy body weight while the current body weight, height and waist circumference were measured. More than half of mothers (61.7%) were discontinued BF and 38.3% of mothers still breastfeed their child. The prevalence of exclusive breastfeeding (EBF) for six months was 51.7%. The mean duration of any BF at the first 12 to 36 months after post-partum was 15.0 ± 7.6 months with 31.7% were still BF up to 24 months of age. Mother's age (r= 0.288, p=0.026), duration of EBF(r=0.408, p= 0.001) and age of introduction to formula milk (r= 0.550, p= 0.000) were positively correlated with duration of any BF. In conclusion, the older the mothers, the longer duration of EBF and the older the child's age of introduction to formula milk were related with longer duration of any BF.

A52 Factors associated with body weight status among Malay housewives in Baling

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This cross-sectional study determined the factors associated with body weight status among 188 Malay housewives from four randomly selected villages in Mukim Pulai sub-districts, Baling. Dietary intake, perception of body image, and physical activity were assessed using 2-day 24-hour dietary recalls, Thompson and Gray Contour Drawing Rating Scale, and International Physical Activity Questionnaire (IPAQ) respectively. The weight and height of all respondents were measured and their Body Mass Index (BMI) was determined. The prevalence of underweight was 6.9%, normal weight 24.0%, overweight 36.1%, and obesity 33.0%. The means.d. for age and household income were 47.1511.07 and RM896.81660.79 respectively. Most respondents (86.0%) were married, 33.5% were in the 50-59 years age group, 51.0% had attended secondary school and 38.3% had income below RM500. The prevalence for incorrect perception of body weight was 67.0%. The mean discrepancy score for perception of body size was 5.241.59, while 67.6% were in moderate physical activity level. Significant relationships were found between perceptions of body weight status (x^2=0.000, p=0.536) and perception of body size (r=0.539, p=0.000) with body weight status. However, no significant relationships were found between socio-demographic backgrounds, dietary intake, and physical activity with body weight status. Interventions need to be carried out to prevent the obesity problems in this community.

A53 Assessment of nutritional status, abdominal obesity and level of physical activity among shift working female nurses in Hospital Universiti Sains Malaysia

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The objective of this study was to evaluate the nutritional status,, abdominal obesity and level of physical activity among nurses working in Hospital Universiti Sains Malaysia. This cross sectional study was conducted among 190 female nurses aged from 21 to 55 years old, who were systematically sampled from all wards by using the name list. Respondents were

interviewed on sociodemographic characteristics, breakfast habit, sleep duration and night shift, dietary pattern and their level of physical activity. Weight, height, body mass index (BMI), waist to hip ratio and body fat percentage were measured, recorded and calculated. Mean BMI was 24.8 (5.1) and about half of the respondents (48.9%) were having normal body mass index, 43.3% were overweight and obese whereas 7.9% were underweight. Majority (almost 80.0%) of the respondents were having normal waist circumference. In term of body fat, 48.9% had normal body fat percentage while 45.8% had high percentage of body fat. All sociodemographic variables did not show any significant association with abdominal obesity except age (p=0.001). Further analysis of simple linear regression showed age, salary per month and number of children did have linear relationship and were predictors to abdominal obesity. Findings showed risk of abdominal obesity tend to increase with age among adult female nurses. Duration of sleep, night shift frequency, breakfast habit and physical activity level also did show any significant association or linear relationship with abdominal obesity. In term of dietary pattern, sugar and white rice consumption was top two highest food items daily and 74.2% were breakfast skipper, but no association with abdominal obesity was found. In conclusion, larger sample size in different hospital setting with more homogenous sample in term of age should be considered in future study to identify the factors that are associated with abdominal obesity.

A54 Association of early life and early feeding practices on nutritional status of Malay preschoolers independently of socio-demographic status, parental body mass index and dietary behavioral practices

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Growing body of evidences suggest that poor fetal growth and feeding practices in early life are significantly associated with increased risk of obesity and health risks in their later life. The aim of the study was to examine the association of birth weight and early feeding practices on nutritional status, after adjusting for socio-demographic status, parental body mass index (BMI) and dietary practices, among 380 Malay preschooler boys and girls aged 3 to 6 y living in Kota Bharu, Kelantan. Pre-piloted parental questionnaires were to access early life parameters, dietary and lifestyle practices of the preschoolers, whereas nutritional status was assessed by the anthropometry. The mean age of the participants was 4.2±0.7 y, with majority of them (98.7%) were classified as thinness (63.4%) and normal BMI (35.3%). Mean weight at birth was 3.1±0.5kg, which girls had significantly greater birth weight compared to boys (3.3kg vs. 2.9kg; $p<0.001$). Majority of the mothers (88.4%) reported to have breastfeeding. Prevalence of exclusively breastfeeding up to 6 months was 74.7%. Adjusted *Pearson* correlation analysis found that weight at birth had significantly associated with BMI ($p<0.01$) and waist circumference (WC) ($p<0.001$), and a positive association between breastfeeding status and BMI ($p<0.01$), after adjusting for age, gender, parental BMI levels, weekly frequency of snacking and fast food intake. Multivariate analysis (ANCOVA) revealed that higher levels of birth weight ($P_{fortrend}=0.004$), early breastfeeding status ($P_{for\ trend}<0.001$) and duration of breastfeeding ($P_{for\ trend}=0.021$) had significantly associated with normal body weight compared to those preschoolers of thinness group. The findings suggesting that early life parameters such as birth weight and breastfeeding practices exert significantly associated with better nutritional status of Malay preschoolers.

A55 Weight-for-age, height-for-age and BMI-for-age for Malaysian preschool children (2-5 years): Comparison with WHO Growth Standards

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Growth charts are the most valuable tools in assessing nutritional status and monitoring physical growth in children. Currently, in Malaysia, the WHO Child Growth Standards are used as reference. With the availability of data from the Third National Health and Morbidity Survey (NHMS III) of 2006, growth charts for Malaysian children (MyGC) were developed. Our objective is to compare Malaysian preschool children's weight-for-age, height-for-age and BMI-for-age with WHO growth standards. Weight and height measurements from NHMS III were used to construct gender-specific weight-for-age, height-for-age and BMI-for-age charts using LMS ChartMaker Pro software. The 3rd, 15th, 50th, 85th and 97th percentiles of MyGC were plotted against the corresponding percentiles on the WHO growth standard for age 2-5 years. For girls, all MyGC percentiles for weight-for-age were below the corresponding WHO percentiles and the gap widened with increase in age, while the WHO 3rd percentile of height-for-age was consistently higher by approximately 5cm. For boys, both weight-for-age and height-for-age percentiles of the MyGC curves were lower than WHO curves. For both boys and girls, the 3rd, 15th and 50th percentile curves of MyGC BMI-for-age were below, while the 97th percentile curves were above, the corresponding WHO percentiles. There were discrepancies in weight-, height- and BMI-for-age between MyGC and WHO curves. Overall, Malaysian preschool children weighed less and were shorter in stature by the WHO standards. Prevalence of both underweight and obesity based on BMI-for-age were higher by the WHO standards compared to MyGC. However, caution is advised when comparing MyGC curves with WHO curves as the NHMS study was not originally designed for the purpose of developing growth charts.

A56 Knowledge, attitude, and practices on the use of nutrition and food labelling between nutrition and non-nutrition students in Universiti Putra Malaysia, Serdang Selangor

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Nutrition and food labelling provides an information and become vital to help consumer in choosing healthier food. This study aims to determine the differences between knowledge, attitude, and practices on the use of nutrition and food labelling among nutrition and non-nutrition students in Universiti Putra Malaysia, Serdang Selangor. A total of 176 respondents, age between 21 to 32 years old with mean age 22.74±1.33 from Faculty of

Medicine and Health Sciences and Faculty of Agriculture were involved in this study. The questionnaires were utilized to obtain information on demographic and socio-economic backgrounds, knowledge, attitude and practices on the use of nutrition and food labelling. Data were analysing using descriptive and inferential analysis. The results indicated that all of nutrition students (100.0%) had received the information on nutrition and food labelling while only 87.5% of non-nutrition students had received the information. Majority of the nutrition students (90.9%) received the nutrition and food labelling information from the lecture while majority of non-nutrition respondents received the information from television (62.5%). About 70.5% of non-nutrition students were interested to take courses related to nutrition. Majority of nutrition students (70.5%) had moderate knowledge on nutrition and food labelling compared to non-nutrition students (48.9%). However, none of non-nutrition students had higher knowledge on nutrition and food labelling compared to nutrition students (10.2%). Both of nutrition (89.8%) and non-nutrition (51.1%) students showed high positive attitude towards nutrition and food labelling. About 75.0% and 77.3% of nutrition and non-nutrition students showed moderately good practices towards nutrition and food labelling, respectively. There are significant different in the mean of knowledge ($t=7.308$, $p<0.00$) and attitude ($t=6.005$, $p<0.00$) towards nutrition and food labelling among nutrition and non-nutrition students. Nevertheless, there is no significant difference in the mean of practices ($t=1.705$, $p<0.09$) towards nutrition and food labelling among nutrition and non-nutrition students. In conclusion, although both nutrition and non nutrition students had higher on knowledge and attitude towards nutrition and food labelling, but there are still a gaps in practicing the information regarding nutrition and food labelling. Therefore, effective efforts should be made to fill the gaps to promote nutrition and food labelling.

A57 The nutritional knowledge, attitude and practice of children and adolescent from an orphanage institution in Kuala Lumpur and their nutritional status: A preliminary study

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This study aims to determine the nutritional status by using anthropometry method and Knowledge, Attitude and Practice on nutrition and good nutritional habits by using self constructed questionnaire. This study was based on the perception that orphans are vulnerable group that also lack of attention for healthcare and good nutritional status. An orphanage institution in Kuala Lumpur was chosen for this prelimanary study on 51 children and adolescent aged 7 until 17 years old, 18 males (35%) and 33 females (65%). More than 88% had no parent alive and 11.8% had only living mother. This study found out that majority of the respondents have normal weight (59%), 4% were underweight, 18% were overweight and obese. There was significant difference of mean scores of nutritional knowledge between children and adolescents ($p<0.05$). The result shows that the number of orphanages with high level of knowledge score was 21 (41.2%). Only 2 out of 51 orphanages scored low in the nutrition knowledge survey. Nutrition knowledge was positively correlated with nutrition practice ($r_p=0.305, p<0.05$). There was also significant difference in BMI of different gender. In terms of the exercising practice, there is significant difference in frequency of doing exercise between gender ($p<0.05$). As a conclusion, majority of the respondents have normal weight and the knowledge was positively correlated with practice.

A58 Assessment of total body water, fat-free mass and fat mass using bioelectrical impedance analysis (BIA) among distance runners

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Running in a tropical country like Malaysia makes runners more vulnerable to dehydration due to excessive sweating and thus affecting an individual's body composition. Hence, the objective of this study was to assess the total body water, fat-free mass and fat mass using bioelectrical impedance analysis (BIA) among distance runners. This study was a cross-sectional study using convenience sampling. Fifty subjects from several running clubs around Klang Valley gave their informed consent and volunteered to participate in this study. Measurements of height and weight were taken. Measurements using BIA and 4-site skinfold thickness were done on all subjects before and after training to determine their body composition. There was significant changes in percentage of total body water, fat-free mass and fat mass among distance runners before and after training ($p < 0.05$). The measurements of fat-free mass and fat mass determined using BIA produced a higher reading compared to skinfold thickness measurements ($p < 0.001$). Nevertheless, there were significant, moderate correlation for measurements of fat-free mass (before: $r = 0.501$, $p < 0.001$; after: $r = 0.484$; $p < 0.001$) and fat mass (before: $r = 0.593$, $p < 0.001$; after: $r = 0.599$; $p < 0.001$) determined using BIA and skinfold measurement methods. Lastly, there were no significant correlation between changes in total body water ($r = - 0.145$; $p = 0.314$), fat free mass ($r = - 0.144$; $p = 0.318$) and fat mass ($r = 0.136$; $p = 0.345$) against changes in body weight among the distance runners. Hence, this study confirmed that total body water, fat-free mass and fat mass of distance runners changes significantly after training. Body composition assessment among recreational distance runners can be easily done using BIA as a means of monitoring changes in body composition which may impact performance.

A59 Body mass index, dietary components and HbA1c level among non-diabetic adults in Klang

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Glucose concentration plays an important role in the metabolic syndrome. High blood glucose concentration indicates the beginning of or existing glucose intolerance and insulin resistance, which may contribute to the onset of type 2 diabetes. Obesity is one of the main elements of metabolic syndrome while the risk of developing type 2 diabetes has been shown to be associated with several dietary risk factors. Little research has explored the association of body mass index (BMI) and various dietary components with glycated hemoglobin (HbA1c) in adults with intermediate hyperglycemia as well as those with normoglycemia. The objective of the study was to determine the cross-sectional association between BMI and dietary components with HbA1c among non-diabetic adults in Klang. A total of 84 adults aged 20 to 59 years without a previous diagnosis of type 2 diabetes

were recruited for this cross-sectional study. Weight and height of the subjects were self-reported. Dietary intake was assessed by using 24 hour diet recall. HbA1C test was done to obtain glycated hemoglobin percentage of the subject. There were significant difference found in energy, carbohydrate and protein intake (kcal/day, % energy and g/1000kcal) between Malay, Chinese and Indian subjects. When dietary components were analysed (g/1000kcal), there was no significant association between dietary components and HbA1c based on Pearson's Correlation. Compared to dietary components, there was a significant association between BMI and HbA1c with chi-square p value less than 0.05. Based on these findings, the subjects' HbA1c is likely to be influenced by BMI. Further study should focus on examining the dietary components and HbA1c with other interplaying factors to be taken into account.

A60 Association of body weight status with eating behaviours, self-efficacy and nutrition knowledge among working adults

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The health problems associated with eating behaviour are not unique to Malaysia. Recent economic development in the country has contributed to influencing lifestyle of the population including meal patterns. This in turn explains the rapid increase in the prevalence of overweight and obesity nationwide. Promoting healthy lifestyle behaviours is an important aspect of interventions to further prevent the complications of overweight and obesity. The objective of the present study was to determine the association of body weight status with eating behaviours and self-efficacy in a selected group of desk job working adults. One hundred and fifty desk job workers were recruited for the study in the Klang valley. Subjects were interviewed using structured questionnaire to obtain their socio demographic information. Weight status was determined in terms of Body Mass Index (BMI) and waist-hip ratio (WHR). Information on eating Behaviour was obtained using the Three Factor Eating Questionnaire (TFEQ). A self-administered Diet-SE scale was used to assess the self-efficacy of the respondents and a nutrition knowledge questionnaire was also administered. About 66.9% of the subjects were overweight and obese. The mean age of the respondents was 37.6 ± 10.6 years. Males (63.2%) outnumbered the females. A significant difference ($p<0.05$) was observed between BMI categories and age, gender, ethnicity, years of work and marital status. There was no significant difference ($P>0.05$) observed between the body weight status and the scores of the TFEQ-18. However, there was an increasing trend observed in the mean scores of Cognitive Restraint (CR) and Emotional Eating (EE) aspects with increasing BMI. The results obtained suggest that individuals with higher BMI and greater abdominal adiposity were able to better resist high caloric food (HCF)when exposed to it, resist food when being with friends or feeling tired (social internal factors, SIF) and able to resist eating in an negative emotional eating(NEE) event. Age, ethnicity, marital status, years of working and health status were found to be positively associated with nutritional knowledge ($p<0.05$).It is imperative for the working adults to be more conscious and in control of their own body weight status. Efforts should be made to lower the overweight/obesity status at the individual level.

A61 Metabolic risk factors among institutionalized elderly in Selangor

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Metabolic syndrome (MetS) had been known as a clustering of risk factors for cardiovascular disease and diabetes. Institutions were chosen as target area because, the characteristics of those staying at caring centers differs than those staying at their own home alone, with families or friends based on life style factors (smoking, physical activity, eating habit) and stress (depression, anxiety, psychosocial) which are factors contributing to increase risk factors of metabolic syndrome. Thus, this study aimed to determine institutionalized elderly whom were at risk of developing MetS. Anthropometric measurements, socio-demographic characteristics, medical record and information on their family history were obtained. Non-government elderly institutions all over Selangor were chosen, excluding nursing homes to ensure respondents are according to the inclusion and exclusion criteria. Respondents were chosen through convenient sampling from institutions that were willing to cooperate. A total of 100 respondents between the ages of 60-90 fulfilled the criteria to participate in this study. Approximately, 55% and 45% of the respondents were female and male respectively. Five risk factors (body mass index, blood pressure, waist circumference (WC), insulin resistance, cholesterol level) were identified. Mean BMI of the respondents is 22.6 ± 3.8. The risk factor distributions are hypertension (62%), at risk WC (54%), insulin resistance (41%), and hyper-cholesterol (39%). A majority of the respondents were at moderate risk category (50%), followed by (40%) and (10%) for high risk and no risk category respectively. As for the comparison between gender, BMI and family history of obesity seems to show significant difference with $t=-1.96$, $p<0.01$. Male respondents had a significantly higher frequency of smoking ($p<0.01$). Overall results show that respondents are at moderate risk of developing metabolic syndrome. All elderly institutions should intervene healthy eating and lifestyle promotion among the residents to reduce the incident of high metabolic risk factors thus preventing development of MetS.

A62 The association of breastfeeding practice and physical activity level with postpartum weight changes among mothers in selected medical centres in Selangor and Wilayah Persekutuan

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The prevalence of obesity is at increasing level, particularly among women with various factors including weight gain during pregnancy or post-partum as one of the contributing factors towards obesity. Lifestyle and physical activity factors have been identified as important factors contributing to healthy weight management. The association of breastfeeding practices and postpartum weight gain however, is still controversial. Thus, this study is conducted to examine the association of physical activity and breastfeeding practice on weight changes among mothers in postpartum periods. Mothers (n=130) in their 8^{th} to 12^{th} month of postpartum period aged from 18 to 30 years were recruited. Their pre- pregnancy weights were collected using previous hospital records. The post pregnancy weight was measured during the follow-up visit to the hospital. The respondents were interviewed

using questionnaires, to gather information on socio-demographic characteristics, physical activity level and breastfeeding practices. About 70% of women gained weight during their postpartum period. Physical activity is negatively correlated with weight changes ($r= 0.591$, $p<0.01$). The results also significantly shown that mean difference of weight gain is lower in breastfeeding mothers as compared to non-breastfeeding mothers ($t= 4.148$, $p<0.05$). Breastfeeding practice and physical activity level is strongly correlated with postpartum weight changes. This study suggests that healthcare professionals should strongly encourage postpartum women to practice breastfeeding habit and involve in exercise program in order to reduce prevalence of postpartum weight retention.

A63 Anthropometric measurements and nutrient intake of institutionalized elderly with different categories of denture status in Selangor

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The objective of the study is to determine the anthropometric measurements and nutrient intake among institutionalized elderly with different categories of denture status in Selangor. A total subject of 103 (51 males and 52 females) institutionalized elderly aged 60 and above with mean age of 69.2 ± 6.3 year old were recruited for this study. The respondent's Body Mass Index (BMI) reference to WHO, Mid-Upper Arm Circumference (MUAC) and Dietary Measurements (Food Frequency Questionnaire) from MOH (2008) were used. The association of anthropometric measurements and dietary measurements with different denture status were analyzed by using ANOVA. Out of 103 respondents 39.0%(n=40) has no dentures with minimal number of teeth of 21, 31.0%(n=32) respondents were having partial dentures either in upper part of lower part with number of natural teeth in the range of 11-20, and 30.0%(n=31) respondents have full denture with natural teeth of 10 or less. The fat intake and denture status has a weak inversely correlation of ($r= -0.21$, $p < 0.05$). There is no significant relation between BMI and MUAC with different categories of denture status. There is significant association between gender and BMI classification where $p<0.05$. Star fruit is the most commonly avoided food in all the three categories of denture status and rice the most commonly consumed food among the entire respondent regardless of the denture status. There is an association between nutrient intake and different categories of denture status, however there is no significant association between anthropometric measurements and different categories of denture status among institutionalized elderly in Selangor. Further studies could focus on comparing the nutritional status of institutionalized and housebound elderly with incorporation of other confounding factors.

A64 Overweight mother/stunted child pairs among Orang Asli households (double-burden households) in Krau Wildlife Reserve, Malaysia

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As the world's indigenous peoples are experiencing nutrition transition, they are at increased risk of double-burden of malnutrition. A cross-sectional study was conducted to identify the prevalence of Orang Asli households with an overweight mother and a stunted

child (double-burden households) in Krau Wildlife Reserve, Malaysia. This study also aimed to determine the demographic and socio-economic factors associated with double-burden households. Demographic and socio-economic information, and anthropometric indices (height-for-age, HAZ for child and body mass index, BMI for mother) were obtained from 160 mother-child pairs. The study showed that the prevalence of overweight mother/ stunted child (OWM/STC) was 19.4%, whereas the prevalence of normal weight mother/ normal height child (NWM/NHC) was 12.5%. Nearly half (48.1%) of the households had a normal weight mother and a stunted child (NWM/STC). Boys (adj. OR: 15.279, $P < 0.01$), older age mothers (adj. OR: 1.222, $P < 0.05$), mothers with higher education (adj. OR: 1.908, $P < 0.05$) and hardcore poor households (< RM97.00 per capita) (adj. OR: 31.668, $P < 0.01$) were significantly associated with double-burden households. In conclusion, double-burden of malnutrition is an emergent public health concern among the Orang Asli communities undergoing demographic and socio-economic changes. Future policies, nutrition and health intervention for the Orang Asli should address both under- and over-nutrition simultaneously within the same household.

A65 Development and evaluation of nutrition guidebook for pregnant women

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Nutrition is essential during pregnancy to ensure optimum growth and development of fetus as well as health of the mother. The objective of this study was to develop and evaluate a nutrition booklet for pregnant women. This study was divided into three phrases which were the development of booklet content, content validation by health professionals and evaluation by pregnant women. Information from credible online sources and text book were used to develop nutrition guidebook content. A total of twelve days menu was planned by using food exchange table, Recommended Nutrient Intakes for Malaysia 2005, Food Composition Table and Atlas of food exchange and portion sizes as the references. Six health professionals from the field of nursing, gynecology, nutrition and dietetics were involved in the content validation process of nutrition guidebook. Thirty-three pregnant women who attended antenatal clinic were randomly selected from a public health clinic and a private hospital in Klang Valley to evaluate nutrition guidebook. The validated questionnaire i.e. the Tool to Evaluate Material Used in Patient Education (TEMPtEd) was used to evaluate the suitability of the booklet in 5 subscales including content, motivating principles, literacy, layout and typography and graphics. Nutrition guidebook for pregnant women was developed in A5 size with 188 pages. This guidebook contains information on physiological changes and common problems during pregnancy, nutrition for pregnant, together with twelve days planned-menu for Malay, Chinese, India and Western food. Comments from health professionals were considered wisely to improve the standard of nutrition guidebook. Based on the TEMPtEd assessment, pregnant women in this study were satisfied on the content, motivation principle, readability, graphic, layout and typography of the guidebook. Mean score for TEMPtEd was 52.976.27 which indicates it is a good nutrition guidebook. Nutrition guidebook developed in this study was accepted by majority of pregnant women.

A66 Development and evaluation of an education module on physical activity for overweight and obese adolescents

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This study aimed to develop and evaluate an education module on physical activity for overweight and obese adolescents aged 13 to 15 years old. This study was conducted in three phases: Phase 1 - needs assessment conducted through four rounds of small group discussions with 10 secondary school students each round; Phase 2 - development and content validation of the module based on literature search that included relevant journal articles and educational materials from Ministry of Health Malaysia and other sources; and Phase 3 - acceptability evaluation of module using Tool to Evaluate Material Used in Patient Education (TEMPtEd) questionnaire, involving 35 students, 5 secondary school teachers, 5 parents and 5 health professionals. Three rounds of small group discussions with 8 subjects each round were also conducted to further assess the suitability of the modules. The module, in the form of a book, comprised five units: (1) introduction to physical activity, physical activity pyramid and physical activity intensity level, (2) correct techniques to exercise, formula FITT (Frequency, Intensity, Time, Type), (3) safety issues during exercise, (4) importance of planning and concept of cross-training and (5) information on the health implications of sedentary activities and ways to reduce sedentary behaviours through check-lists and self evaluation form. Results from TEMPtEd showed moderate level of acceptance among adolescents (47.1 ± 4.8) and adults (49.5 ± 6.9). Results from small group discussions showed that the education module was rated positively on the graphics and design while the content of the module was comprehensible. We concluded that the physical activity education module was generally suitable for use among adolescents. However, further improvements on the content and design of the module will be needed before applying this module in a large scale study.

A67 Prevalence of mis-reporting of energy intake in Malay children varies based on application of different cut-points

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The degree of dietary mis-reporting among Malaysian children is unknown due to a lack of investigation and lack of agreed methods of identification. In the absence of direct measures of total energy expenditure, cut-points are used to identify mis-reporters. Deciding on the most appropriate cut-points is a challenge due to a lack of standardised recommendations,

particularly amongst children. This study aimed to apply a range of commonly used methods to establish cut-points for dietary data collected from a sample of Malay children aged 9 to 11 years (n=14) in order to compare the prevalence of energy mis-reporting across these methods. Participants provided dietary intake data using interviewer administered 24-hour dietary recalls over three occasions. The cut-points used included the Goldberg equations (1991 and 2000), Torun cut-points and the Black & Cole method. Using a range of cut-points, up to 11 of 14 children were classified as mis-reporters, with more under-reporters (between seven and eight children), than over-reporters (four or less children). When newer cut-points such as Goldberg equation (2000) and Black & Cole were used, a higher proportion of over-reporters were identified. Nine participants were classified into the same category of energy reporting despite different cut-points applied. There were significant differences in the proportion of children classified as energy mis-reporters when applying BMR calculated using FAO/UNU/WHO (1985) and Malaysian-specific equations to the cut-points ($p<0.05$). The current results suggest that energy mis-reporting is common amongst Malay children, but varies based on the method of assessment. Concurrent objective evaluation of total energy expenditure will help identify which cut-point is more appropriate for use in Malay paediatric populations.

A68 Knowledge, attitude and practice (kap) and nutritional status of preschool children: an association with early childhood caries in Bachok, Kelantan, Malaysia.

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The objective of this study was to determine the relationship between knowledge, attitude and practice (KAP) on nutrition and oral health and nutritional status of children with caries status among preschool children aged 5 to 6-year-olds in Bachok, Kelantan. This is a cross sectional study and was conducted at 19 TABIKA (KEMAS) in Bachok, Kelantan. A total of 382 subjects were completed this study. Anthropometric measurements and oral health assessment were performed toward the children and the questionnaires were distributed to their parents. The questionnaire consists of two sections. First section was to retrieve the socio demographic information while the second section was on KAP on nutrition and oral health. There are 40 questions were assessed related to KAP: 20-items for knowledge, 6-items for attitude and 14-items for practice. Result showed that 34% of preschool children were underweight and 23.6% were severe underweight respectively. For the assessment of height-for-age, it showed that 31.7% of them were stunted and 18.6% were severe stunted. The nutritional status of the subjects showed there were 8.4% of them were severe thinness and 16.2% were thinness. While, only 3.2% of them were obese. Moreover, more than half of the preschool children have high caries (63.1%). The assessment of KAP of their parents showed that most of the parents have moderate knowledge and attitude on nutrition and oral health of their children with 63.9% and 72% respectively. But, the practice score of the parents toward nutrition and oral health was high (78.3%). However, there was no association between knowledge, attitude and practice of parents and nutritional status of children with caries status among preschool children. As a conclusion, more than half of the preschool children were high in caries category, underweight and stunted and most of the parents were in moderate of knowledge and attitude.

A69 Pattern of gestational weight gain among pregnant women

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This study describes the pattern of gestational weight gain among pregnant women. A total of 589 pregnant women aged 18 to 42 were recruited from Maternal and Child Health Clinic in Hulu Langat disctrict, Selangor (283 pregnant women) and Seremban, Negeri Sembilan (306 pregnant women) between November 2010 and April 2012. A set of pre-tested interview-administered questionnaire was used to collect socio-demographic, obstetrical information, dietary intake and physical activity. Rate of gestational weight gain was calculated as average weekly weight gain in that particular trimester of pregnancy. Pre-pregnancy body mass index (BMI) classified women as 72 (12.2%) underweight, 307 (52.1%) normal, 129 (21.9%) overweight and 81 (13.8%) obese. Mean rate of weight gain was 0.48 ± 0.62 kg/week for second trimester and 0.40 ± 0.43 kg/week for third trimester. Mean intake of energy, carbohydrate, protein, fat, dietary iron, vitamin D and calcium were 1487 ± 509 kcal/day, 183.2 ± 82.45 g/day, 62.8 ± 24.1 g/day, 46.3 ± 23.8 g/day, 17.6 ± 10.83 mg/day, 0.6 ± 1.4 μg/day and 666.5 ± 526 mg/day, respectively. In conclusion, more than 30% of underweight pregnant women tend to gain weight below recommended range while about 61.7% of obese women tend to gain weight above recommended range during pregnancy. This information is important to assist health professionals in identifying areas for improvement as failure to meet lifestyle recommendations for a healthy pregnancy places women and children at risk of future health problems.

Group E: Food Science And Technology

E01 The effects of brown rice powder addition on nutritional composition and acceptability of some selected traditional rice-based local *kuih*

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The objective of this study was to investigate the effects of brown rice powder (BRP) addition on the proximate composition, the total dietary fibre content and the acceptability of some selected traditional rice-based local *kuih.*Two types of *kuih* samples, namely *KuihTalam* and *KuihLompang* were prepared with BRP at the levels of 30%, 60% and 90%. The *kuih*samples were analyzed for nutritional composition and sensory acceptance.For *KuihTalam*, the addition of BRP at the level of 90% increased the total dietary fibre (from 2.77% to 3.45%), fat (from 5.73% to 6.95%) and moisture (from 64.10% to 64.12%) content. However, with the increasing BRP level in the *kuih*, the ash content was decreased significantly (from 1.83% to 1.22%) while the protein content was not significantly affected (from 3.41% to 3.59%).In addition, there was significant increase in total dietary fibre content (from 2.64% to 3.15%) and protein content (from 2.36% to 2.51%) with the incorporation of 90% BRP in the *KuihLompang*. The moisture (from 36.79% to 36.83%), ash (from 1.11% to 1.21%) and fat (from 8.51% to 8.73%) content were not significantly affected for all percentages of BRP addition. Results of sensory evaluation showed that the *KuihTalam* with 30-90% of BRP were significantly different from the control sample in terms of appearance, colour, firmness,

adhesiveness, chewiness, taste and overall acceptance attribute. On the other hand, there was no significant difference for all sensory attributes of *KuihLompang* formulated with 30-90% of BRP compared to the control.In summary, sensory evaluation showed that only 30% addition of BRP in *KuihTalam* was acceptable, while all BRP-incorporated *KuihLompang* were acceptable. Thus, BRP is potentially used in improving nutritional composition of local *kuih*without excessively altering their sensory score.

E02 Evaluation of palatability and retention of ascorbic acid and mineral contents in selected vegetables prepared with different types of cooking methods

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Vegetables have sufficient amount of nutrients like vitamins and minerals that can prevent oxidative diseases. However, different cooking methods may affect nutrients content and sensory attributes that can decrease the vegetables intake. This study aims to determine the ascorbic acid (vitamin C) content, mineral contents and palatability of selected vegetables prepared with different types of cooking methods. The vegetables used were 'kailan' (*Brassica oleracea*), red sweet pepper (*Capsicum annuum*) and 'kangkung' (*Ipomoea aquatica*) treated with different types of cooking methods including steaming, boiling and stir-frying. The vitamin C was determined by using Potassium Iodate titration method. The mineral contents of iron, zinc, copper and chromium were determined by using Atomic Absorption Spectrometry (AAS). The palatability was determined by sensory evaluation. The results showed that vitamin C in 'kailan' prepared by stir-frying method had the highest vitamin C retention (11.77 mg/L). The method of cooking with the highest retention of vitamin C in red sweet pepper was steaming method (18.56 mg/L). The vitamin C content in stir-fried 'kangkung' had the highest retention (1.16 mg/L), followed by steaming (1.02 mg/L) and boiling (0.39 mg/L) method. 'Kailan' cooked with stir-frying method retained the highest iron (1.16 mg/L), zinc (2.07 mg/L) and copper content (0.12 mg/L). Stir-fried sweet red pepper retained the highest iron (0.94 mg/L) and zinc value (0.83 mg/L). The highest retention of iron (8.11 mg/L), zinc (2.76 mg/L) and copper (0.29 mg/L) in 'kangkung' were found in steaming, stir-frying and boiling method, respectively. In sensory attributes, there were no significant differences in overall acceptance of different cooking methods in 'kailan' and sweet red pepper. The overall acceptance of stir-fried 'kangkung' was better than boiled 'kangkung'. In conclusion, stir-frying method demonstrates the best cooking method in nutrients retention and highest palatability of cooked vegetables in this study.

E03 The pharmacochemistry and chemiluminescence property of *Camellia* extracts

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The leaves of *Camellia sinensis* or tea (plant family: Theaceae) is one of the most consumed beverage products in the world. Scientific efforts are continuously initiated in order to investigate the antioxidant activities of the tea extracts. Polyphenols are mainly responsible towards the health benefits. The major phenolics in the tea are found to be the catechins. These compounds were targeted as they are predominant in tea products. It is also recognized that the role of antioxidant property is basically contributed by these compounds.

However, its quantity decreases along with the fermentation process. Therefore, a study is conducted to qualitatively evaluate the presence of pyrogallol in different types of tea by using chromatographic procedures. Pyrogallol, which is the moiety in catechins, was shown to possess the highest antioxidant and antitumor properties in previous work. It is noteworthy that tea consumers may not get the optimum effect of the polyphenols in their home conditions. Therefore, the uniqueness of this approach would include the application of pharmacochemical knowledge into this every day event of tea making, since many literatures mention the potential of tea to our wellbeing. Several parameters could maximize the extraction effects of tea, such as temperature of the solvent and infusion time. In addition, the chemiluminescence assay was also reviewed to get more understanding of the chemistry of tea. It is concluded that this property could be assessed either with the pyrogallol as the parent chemical compound, or with the presence of polyphenols in the tea samples.

E04 Effect of extraction solvent on antioxidant activity of pomegranate peel extract

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Pomegranate (*Punicagranatum*L.) is a nutrient dense food rich in beneficial phytochemicals. In this study, three types of solvent extracts of Pomegranate peel were used to examine the effects of extraction solvent on total phenolics content (TPC), total flavonoids content (TFC) and antioxidant activity by ferric reducing antioxidant power (FRAP) and 1,1-diphenyl-2-picryl hydrazyl radical scavenging (DPPH) were determined. Results showed that extraction solvent had significant effects on TPC, TFC, and antioxidant activity of acetone extract. The highest content of TPC, TFC and antioxidant activity (FRAPand DPPH) were found in 50% acetone extracts. The TPC for pomegranatepeel from84.15 to 168.26 mg gallic acid/100 g dry weight, and TFC were between 42.40 and 87.26mg quercetin/100g dry weight and antioxidant activity (FRAP from 86.21 to 142.21 mg Trolox equivalents/100 g dry weight), DPPH were between 45% and 88.46%). The largest amount of TPC and TFC which leads to more effective radical scavenging effect was shown by 50% acetone extract. Moreover, amount of phenolic compounds and antioxidant activities increased in acetone extract. Acetone 50% solvent showed the greatest capability in extracting antioxidants and inhibiting the free radicals produced. It was concluded that extraction solvent play important roles on the phenolics compounds and their antioxidant activity of pomegranate peel extract.

E05 Germinated brown rice 80% methanol crude extract induced glucagon-like peptide-1 and cholecystokinin release from STC-1 enteroendocrine cell line.

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Gastrointestinal tract has been recognized as the core for various peripheral signals that regulate appetite. Satiation and satiety are essentially influenced by satiety hormones such

as cholecystokinin (CCK), glucagon–like peptide-1 (GLP-1) and peptide YY (PYY) which released from enteroendocrine cells in gastrointestinal system in response to food intake. Different foods stimulate the release of satiety hormones at different degrees, which is largely influenced by their nutrients and bioactive compounds content. Germinated brown rice (GBR) is considered as a whole food due to its rich source of nutrients and bioactive compounds such as dietary fibres, γ-aminibutyric acid (GABA), γ-Oryzanol and acylaied steryl γ-alucoside (ASG). The present study examined whether GBR can modulate satiety hormones secretion*in vitro* using STC-1 enteroendocrine cell line. The effects of different GBR solvent crude extracts on satiety hormones release were investigated by measuring CCK, GLP-1 and PYY in the supernatant after 60 minutes of incubation, respectively, using ELISA assays. At concentration 250μg/ml, GBR hexane, toluene, dichloromethane, methanol and 80% methanol crude extracts promoted GLP-1 secretion whereas only 80% methanol crude extracts induced secretion of CCK ($p<0.05$). None of the crude extracts stimulated the release of PYY. It is found that the GBR crude extracts treatment on STC-1 cells may increase GLP-1 secretion in a concentration-dependent manner. These results suggested that the bio-functional compounds available in GBR 80% methanol crude extracts may act synergistically inducing a high release of GLP-1 and CCK from enteroendocrine cells, thus further strengthen the satiation and satiety signal. This makes GBR a great option in developing a reduced-energy intake, well-balanced diet.

E06 Effect of storage duration and different storage temperature on potassium retention in selected green leafy vegetables

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Green leafy vegetables (GLVs) are generally rich food sources of vitamins and minerals, particularly potassium. Adequate intake of potassium is important; however, patients with chronic kidney disease (CKD) or end-stage renal disease should limit the dietary potassium intake to prevent hyperkalemia due to their inability to excrete excessive potassium, which can further lead to irregular heartbeat and death. Evidences showed that storage duration and different storage temperature can influence the nutrient content of GLVs. The present study was undertaken aimed to compare the effect of storage duration (one day and two days) and different storage temperature (4°C and 31±1°C) on potassium retention in Spinach, Chinese mustard leaves and Chinese kale, which are the commonly consumed GLVs by Malaysian. The potassium content of samples was determined by using Flame Atomic Absorption Spectrophotometry. Findings of the present study showed that the potassium content of vegetables was in the order of Spinach (736.21 ± 5.58mg/100g), followed by Chinese kale (363.58 ± 1.92mg/100g) and Chinese mustard leaves (183.52 ± 0.97mg/100g). There was no consistent trend observed on the effect of different storage duration and different storage temperature on potassium content in these three types of vegetables. The potassium content of Chinese mustard leaves and Chinese kale increased significantly upon storage, regardless either under room temperature or refrigerated condition for one day and two days, respectively. Similar trend was not observed with Spinach samples, where the potassium content in Spinach decreased after storage. However, there was no significant difference in the potassium content between Day 1 and Day 2 in Spinach at room temperature. In a nutshell, the effect of storage on potassium content in GLVs needs further exploration before a solid scientific recommendation on the appropriate storage method and duration can be made for the general population in general, and to CKD and hypertension patients in specific.

E07 Ultrasound-assisted extraction of germinated brown rice against pancreatic lipase, adipogenesis and adipolysis in 3T3-L1 adipocytes

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This study evaluated anti-obesity effects of seven different solvent (n-hexane, toluene, dicholoromethane, ethyl acetate, absolute methanol, 80% methanol and deionized water) extracts of germinated brown rice (GBR) on pancreatic lipase activity, adipogenesis and adipolysis in 3T3-L1 adipocytes. Pancreatic lipase activity was determined spectrophotometrically by measuring the hydrolysis of *p*-nitrophenyl butyrate to *p*-nitrophenol at 405nm. Adipogenesis and adipolysis were assayed in fully differentiated 3T3-L1 adipocytes by using Oil Red O staining and glycerol release measurement. This study found that the GBR extract using hexane showed the highest inhibitory effect (13.58±0.860%) at concentration of 200µg/ml followed by hexane extract at 100µg/ml (9.98±1.048%) while GBR extract using ethyl acetate showed the lowest inhibitory effect (2.62±0.677%) at concentration of 200µg/ml on pancreatic lipase activity. The GBR extract using water at 300µg/ml showed 61.55±3.824% of Oil Red O staining material (OROSM), a marker of adipogenesis, significantly ($p < 0.05$) decrease lipid accumulationthan control (ORSM=100%), follow by GBR extract using ethyl acetate at 300µg/ml (ORSM=65.17±3.131%). The highest glycerol release content of adipocytes was GBR extract using toluene at 300µg/ml (5.75±0.757µg/ml) and followed by GBR extract using ethyl acetate at 100µg/ml (5.01±0.714µg/ml). In summary, GBR extracts exhibited inhibitory effect on pancreatic lipase, decrease fat accumulation by adipocyte differentiation inhibition, and stimulate lipolysis on adipocytes. Therefore, GBR might be furthered study and developed as a functional food in helping the treatment and/or prevention of obesity.

E08 Dietary fiber, total antioxidant activity and antioxidant vitamins of *Oxalis barrelieri* juice

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Generally, herbs have been used as food and for medicinal purposes for centuries.Herbs have brought a pharmacological effect in humans based on the medicinal qualities and the capacity of the plant towards improving lives through public health nutrition. In Peninsular Malaysia, a new traditional herb has become widespread among the indigenous people, that is *Oxalis barrelieri* and ithas been affirmed to have effect on free radical scavenging activities. The study aimed to determine dietary fiber, total antioxidant activity and antioxidant vitamins of A and C contents in *Oxalis barrelieri*juice for health purposes. The juice extracts was obtained using "Slow Juicer" juice extractor that used the patented Low Speed Technology System (LSTS) and it was prepared in different concentrations (0, 10, 15, and 20%). All samples were analyzed for total dietary fiber, total antioxidant activity and antioxidant vitamins of A and C contents. Total dietary fiber was carried out using AOAC enzymatic gravimetric method. Total antioxidant activity was determined using DPPH free radical scavenging activity while antioxidant vitamins of A and C were determined

based on AOAC methods. Increased concentrations in the juice increased total dietary fiber content (0.85%–2.30%). Three sample concentrations of 1.0M, 2.0M and 3.0M were used to analyze total antioxidant activity in different concentrations of the juice. Meanwhile, increased concentrations in the juice increased total antioxidant activity in 1.0M (9.55mg/ml-25.49mg/ml) and 2.0M (21.28mg/ml-32.59mg/ml). However, total antioxidant activity in 3.0Mat 20% of the juice showed significantly higher compared to the control, 10% and 15% with 47.10mg/ml. Antioxidant vitamin A showed significant increase in increasing concentrations of the juice (0.14mg/100g-2.87mg/100g) while the significant highest amount of antioxidant vitamin C found in 10% of the juice with 3.31mg/100g. Therefore, *Oxalis barrelieri* juice is believed to have beneficial effects in public health nutrition.

E09 The effect of *Kappaphycus alvarezii* in freshwater fish – *Puntius gonionotus* ball: evaluation on nutritional composition, total phenolic content and antioxidant activity

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Seaweed is low calorie food and has been used for centuries in the culinary. Medicinal value and nutritional value of seaweed had been proved in various research and experiments. Emerging studies suggest antioxidant contained in seaweed may protect against a range of diseases of modernity. This study is aimed to evaluate the effect of *Kappaphycus alvarezii* in enhancing the nutritional composition, total phenolic content (TPC) and antioxidant activity of freshwater fish - *Puntius gonionotus* ball for health promotion purposes. Fishballs were developed using different levels (0, 2 and 5%) of *Kappaphycus alvarezii* powder (KA). All samples were analysed for nutritional composition, total phenolic content and antioxidant activity. Nutritional composition analyses were carried out using AOAC methods. Antioxidant activity was determined using 1, 1-diphenyl-2-picrylhydrazyl (DPPH) radical scavenging activity while TPC was determined using Folin-Ciocalteu assay. Addition of KA into fishball samples increase significantly the ash and crude fiber contents while decrease significantly the carbohydrate content with higher KA percentage added. The moisture and protein content of sample are significantly lower in 5% KA treatment fishball when compared to control fishball. No significant difference was found for fat content among the tested fishball. The highest total phenolic level was detected in 2% of KA treatment fishball (0.7739 ± 0.0430 GAE; μg mg^{-1} dry extract) which was significant higher than control fishball. Similarly, the extract of 2% KA treatment fishball was found to be the most potent scavenger in the tested fishball with 30.83 ± 4.80% of radical scavenging activity. The DPPH radical scavenging activity of 5% KA treatment fishball extract in the concentration of 0.6 $mg.ml^{-1}$ and 0.8$mg.ml^{-1}$ were significant higher in comparison to control fishball extract. These finding suggests that *Kappaphycus alvarezii* may be potentially used as functional ingredient to enhance the nutritional values of fishball.

E10 Effect of cutting and blanching on the physical properties and sensory quality of winged bean *ulam* (*Psophocarpus tetragonolobus* (L.) DC)

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The objective of this study was to examine the effect of cutting and blanching on the physical properties and sensory quality of winged bean *ulam* (Psophocarpus tetragonolobus (L.) DC). Survey on the intake of winged bean as *ulam* among students in Universiti Kebangsaan Malaysia (UKM) was also carried out. The winged bean samples were cut into 2 cm, 4 cm, 6 cm, 8 cm and 10 cm and also blanched for 5 minutes, 10 minutes and 15 minutes. Winged bean that was not cut and blanched was used as control. The physical properties that were tested in this study were texture and colour using texture analyzer and colorimeter respectively. Sensory evaluation and survey was carried out among 30 students of UKM. From this study, it was observed that cutting and blanching changed the colour of winged bean from yellowish green to olive green. For the texture, the longer the time of blanching, the softer was the texture. Result achieved from the survey showed that there were many ways to serve winged bean such as in raw form, blanched and also fried with chilli with different sizes of winged bean. Sensory evaluation indicated that raw winged bean was more preferred based on its appearance (5.9), colour (5.9), texture (5.3), taste (4.9), aroma (5.0) and total acceptance (5.4). There was significant different ($p \leq 0.05$) in sensory attribute between raw and blanched winged bean. The overall results of these study concluded that raw winged bean without cutting was the most acceptable among UKM students.

E11 Effect of washing on content of pesticide residue in organic and conventional vegetables

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A series of study was conducted to determine the amount of pesticide residues of organophosphorus compounds (chlophyriphos, quinalphos and profenophos) in leafy vegetable of mustard. The effects of washing treatments using tap water and sodium chloride solution on pesticide residues in organic and conventional vegetable of mustard were determined. Mustard were soaked into tap water and sodium chloride solution (20% w/v) with one to two ratio of sample:water and sample:salt solution. Mustard with no treatment was used as control. The pesticide residues compound was determined by using multi residue method and selected extraction method using Secondary Amine Exchanger-Primary Secondary Amine (SAX-PSA). The samples were injected into Gas Chromatography-Flame Photometry Detector (GC-FPD) for quantification of pesticide residues compound. There was no organophosphorus compounds was detected in organic mustard. Conventional mustard contain two pesticide residues that exceed Maximum Residue Limit (MRL) which are chlophyriphos (1.1 mg/kg), and quinalphos (1.90 mg/kg) while profenophos was detected below MRL value (0.49 mg/kg). Treatments used to decrease or remove pesticide residue by soaking the mustard in tap water could reduce 68% pesticide residues of clophyriphos, 59% of quinalphos and 29% of profenophos in mustard and an amount of 70% of pesticide residues of clophyriphos, 95% of quinalphos and 29% of profenophos was removed by soaking in salt solution for 20 minutes. However, there was only significant different ($p \leq 0.05$) between the two washing treatments for pesticide residues of quinalphos in conventional mustard.

E12 Use of ORAC and TPC to assess effect of breed on antioxidant capacity of goat's milk in Malaysia

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Oxygen radical absorbance capacity (ORAC) and total phenolics content (TPC) assays are useful measures of the antioxidant capacity (AC). This study was conducted to evaluate the AC of different types of goat's milk obtained from one farm in Bandar BaruBangi in Malaysia and compared with cow's milk samples. Milk from five goat breeds (*Kacang, Saanen, Boer, Jamnapari,* and a crossbred of *Jamnapari* and *Saanen*) were collected during the same period of lactation (middle lactation). Results of the study showed that goat's milk samples exhibited a significantly different ($P<0.05$) AC among all breeds. *Jamnapari* milk exhibited the highest AC in ORAC and TPC assays with mean value of 594.61 umolTE/100g F.W and 544.08 mg/100g F.W, respectively. In contrast, the milk samples obtained from the *Boer* exhibited the lowest value (324.99 umolTE/100g F.W, 460 mg/100g F.W, respectively). All milk samples from the goat breeds found to be higher AC than cow milk samples [ORAC (361.96 umolTE/100g F.W), TPC(477.68 mg/100g F.W)],except*Boer* milk showed lower value.ORAC and TPC assays showed a positive correlation among the goat's milk samples ($R^2 = 0.98$). It can be conducted that, goat's milk can be considered as a good source of antioxidants.

E13 Evaluation of fruit leathers made from two cultivars of papaya

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Two different cultivars of papaya (*Carica papaya*L.), Hongkong and Eksotika, commercially grown in Seminayah, Malaysia, were used to manufacture fruit leather. The objective of this was to formulate fruit leather using two different cultivars of papaya. The physicochemical properties changes measured were pH, titratable acidity (TA), moisture, total soluble solids (TSS), texture, thickness and color of the fruit leathers. The fresh fruits were pureed with ingredients (honey,pectin and citric acid) then dried in an oven at 60°C for 12 hours. The drying process significantly affect ($P<0.05$) the physicochemical properties (pH, TA, moisture, TSS, hardness, thickness and colour) in two papaya leather. The results showed significant differences ($P<0.05$) between the pH, TA, moisture, TSS, hardness, thickness and colour of the fruit leathers from different cultivars.As a result, the acidity of the fruit leathers increased significantly after drying. The redness (a^*) and yellowness (b^*) values of the leather color both decreased significantly ($p<0.05$), whereas the lightness (L^*) of the color increased significantly ($p<0.05$).The final fruit leather product was lighter in colour than frish fruit. Both cultivar increased in brightness *(L*)* indicating that fresh papaya had darker colour compared to the fruit leathers.Fruit leather was successfully developed from two cultivars papaya by using three additional ingredients (honey, pectin and citric acid).

Poster Presentations: Day 2 (Group B, C, D and F)

Group B: Dietary Intake, Consumption Pattern and Diseases

B01 Adolescents' perception of paternal and maternal parenting styles, dietary intake and body mass index in secondary schools in Hulu Langat district

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A total of 205 boys and 252 girls aged 13-16 years old from five selected schools were recruited through random cluster sampling to participate in this cross-sectional study. Height, weight and waist circumference were measured and BMI-for–age was calculated. 24-hour dietary recall was used to assess food intake. Respondents completed a pre-tested self-administered questionnaire including measures of socio demographic data and parenting styles. Parenting styles were assessed using Parental Authority Questionnaire which consists of 30 items per parent and yields permissive, authoritarian, and authoritative scores for both father and mother. All items are rated on a 5-point Likert scale with highest scores indicate the perceived parenting dimensions based on the respondents' evaluation. The sample comprised of 84.2% Malays, 8.1% Chinese, 6.8% Indian, while 0.1% were from other ethnic groups. A proportion of 15.6% were overweight and 15.6% were obese for boys, while 13.1% and 11.9% of girls were overweight and obese respectively. Mean of waist circumference were 72.26 ± 11.99 cm in boys and 73.39 ± 10.54 cm in girls. Both of energy and protein intake did not meet Recommended Nutrient Intake (RNI) for adolescents. Boys are significantly have higher calorie (t=3.854, p=0.000), carbohydrate (t=2.154, p=0.032) and fat (t=2.232, p=0.026) intake than girls. Authoritarian parenting (father: 37.05 ± 7.21, mother: 36.58 ± 8.30) is the most common perceived parenting followed by authoritative parenting (father: 35.96 ± 8.51, mother: 36.61 ± 7.45) and permissive parenting (father: 29.60 ± 7.93, mother: 29.96 ± 7.33). Parents are more permissive towards boys compared to girls (father: t=3.284, p=0.001, mother: t=3.262, p=0.001), while mother authoritativeness was significantly greater among girls (t=-2.680, p=0.008). Authoritarianism was significantly associated with calorie intake of the respondents (father: r=0.104, p=0.029, mother: r=0.127, p=0.007). Fat intake was found to be significantly associated with authoritarian father (r=0.110, p=0.020), authoritarian mother (r=0.128, p=0.007) and authoritative mother (r=0.116, p=0.014). BMI-for-age was not significantly associated with any of the parenting style domains, energy and macronutrients intake. These results may suggest parents to inculcate healthy eating lifestyle since early childhood and help in devising more effective measures for intervention program in future.

B02 Dietary intake and physical activity are associated with the prevalence of metabolic syndrome in Indian adults living in Klang Valley

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Asian Indians, compared to other ethnic groups, have a greater prevalence of non-communicable diseases (NCDs). Metabolic syndrome (MetS) is descriptive of the clustering of diagnostic criteria representative of the pre-clinical state of NCDs. This study evaluated relationships between dietary intake and physical activity with MetS diagnosis in 149 healthy adults (58 men + 91 women, 20-65 yrs), living in Kuala Lumpur and its suburbs. Anthropometry, body composition, blood pressure, dietary intake obtained through 3 x 24-hr dietary records and serum biochemistry were measured. MetS prevalence as per the Harmonized (2009) definition was 26.2%, and significantly greater in men than women (OR: 2.66; 95% CI: 1.26 to 5.62). Age was significantly correlated to MetS prevalence (χ^2=3.904, p=0.048). Total daily calorie (1926 *vs* 1700 kcal, p=0.022), carbohydrate (271.8 *vs* 243.4 g, p=0.013), and protein (62.7 *vs* 54.4 g, p=0.013) intakes were significantly greater in MetS compared to non-MetS subjects. But physical activity level (PAL) was not significantly different between both groups. Significant positive correlations between carbohydrate (χ^2=9.81, p=0.020) and fat intakes (χ^2=9.042, p=0.029) with MetS prevalence were observed. Further, PAL score was negatively correlated with HDL-C (r =-0.202, p<0.05) but positively with triglyceride level (r=0.178, p<0.05). In conclusion, increased energy and carbohydrate intakes were associated with MetS risk whereas increased total physical activity was linked to improvements in blood lipid profile.

B03 Hydration practices and perceptions of distance runners

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Distance running has become an increasing trend in Malaysia. As most of these distance running activities are conducted outdoors, hydration is deem important. However, there is no consensus for hydration guidelines that is made available at present. This is a descriptive, cross-sectional study that involves a total of 80 non-elite distance runners. A self-administered survey questionnaire containing 14 questions was distributed among distance runners to assess the common hydration strategies, perception towards water and sports beverages, as well as the knowledge and beliefs on hydration practices. The survey revealed that 41.3% of the runners in this study always hydrate themselves during outdoor runs. 46.3% of them drink during break time at training while about 82.6% of them drink from drinking stations on race day. Half of the runners carry fluid to training ground while 85.0% rehydrate from drinking stations on race day. Trial error or personal experience has the strongest influence (3.49$\pm$1.30) on the runner's drinking habits compared to other sources. Majority of the runners (27.8%) perceived that sports drink is an isotonic drink. Water (56.0%) is the first choice during training for most runners while mix of both water and sports drink (64.0%) are preferred during race day. 64.0% of the runners perceived that dehydration caused a major decreased in performance and 45.0% of them reported to suffer heat-related illness due to dehydration. This study showed that the runners mainly relied on personal experience to regulate their drinking habits. In addition, the runners also showed a lack of understanding towards sports drink and the variation in

opinions towards hydration practices also indicated uncertainties of information on proper hydration such as to avoid dehydration exceeding 2% of body weight. Thus, dissemination of proper hydration information should be worked on to create appropriate awareness among distance runners.

B04 Correlations of personal factors and parental feeding practices with fruit and vegetable intake among school children

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Parental feeding practices influence child's eating behavior in many different ways especially in the consumption of fruits and vegetables (F&V). This cross-sectional study was carried out to determine the correlations of personal factors and parental feeding practices with frequency of F&V intake among 10 to 11 years old school children. A total of 131 children (49.6% boys and 50.4% girls) with a mean age of 10.45 years (*SD*=0.50) and their mothers from three randomly selected primary schools in Shah Alam participated in this study. The mother questionnaire included measures of parental feeding practices. The child questionnaire included measures of F&V consumption, attitude, social influence, self-efficacy, and intention to eat F&V. Weight and height of the children were measured. More boys (33.8%) were overweight and obese than girls (31.8%). The means daily intake of fruit and vegetable were 0.16 times (*SD*=0.11) and 0.17 times (*SD*=0.08) respectively. There is no significant difference in mean frequency of consumption of fruit (t=-0.652, p=0.586) and vegetable (t=1.382, p=0.169) between sexes. Majority of the children consumed fruit (41.2%) and vegetable (58.8%) two times per week. Household income (r=-0.174, p=0.033), father's age (r=0.272, p=0.001), mother's age (r=0.203, p=0.003), and BMI-for-age (r=-0.229, p=0.008) were significantly correlated with fruit intake. Father's age (r=0.188, p=0.050), mother's age (r=0.202, p=0.040), monitoring (r=0.143, p=0.049), restriction for health (r=0.192, p=0.028), child's attitude on vegetable intake (r=0.20, p=0.022), social (parental) influence (r=0.186, p=0.033), self efficacy (r=0.215, p=0.014) and intention to eat vegetables (r=0.245, p=0.005) were significantly correlated with vegetable intake. In conclusion, the consumption of F&V among children was low. Parents play an important role in influencing child's F&V consumption. Nutrition interventions should focus on personal factors and parental feeding practices in order to increase the consumption of F&V among school children.

B05 Knowledge of dietary fats and lipid profiles level among adults in Klang Valley

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This study aimed to investigate the knowledge of dietary fat and lipid profile level among adults in Klang Valley. A total of 90 subjects aged 18 to 59 years participated in this cross sectional study. Subjects were interviewed for their socio-demographic backgrounds. Dietary fat knowledge was assessed using a validated questionnaire consisting of 18 multiple-choice questions with five alternative answers. Subjects' lipid profiles level was measured using SD LipidoCare Analyzer. Mean scores of dietary fat knowledge is 9.68 ± 3.58 with most of the subjects obtained average score (49%), followed by poor score (29%)

and good score (22%). The subjects' interest in nutrition and major sources of nutrition information were significantly associated with their knowledge scores, with $p<0.01$ and $p<0.05$ respectively. Majority of the subjects had normal lipid profiles levels which included triglycerides (TG) (60%), total cholesterol (TC) (60%), High Density Lipoprotein-Cholesterol (HDL) (94%) and Low Density Lipoprotein-Cholesterol (LDL) (88%). There is a significant association between dietary fat knowledge and triglycerides level ($p<0.01$). More educated adults had better dietary fat knowledge. The knowledge of dietary fat to meet healthier lipid profiles range are affected by age, gender, level of education, interest in nutrition and major source of nutritional information. Intervention program to reduce lipid profiles level should include knowledge level of the respondent to be more effective.

B06 Fruits and vegetables intake among adolescents in Kuala Selangor, Selangor

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This cross-sectional study aimed to assess fruits and vegetables intake among adolescents. The study was conducted in 6 differents secondary schools in Kuala Selangor and divided into urban (n=3) and rural areas (n=3) based on information from the District Department of Education. Assessment of nutritional status was done comprised of waist circumference, weight, height, body mass index (BMI), 2-days diet record, and sociodemographic data. A face-to-face interviewed questionnaire was administered to subjects for sociodemographic data. A total of 210 subjects (n=103 females and n=107 males, and n=93 from urban and n=117 from rural area) aged between 13 to 14 years old participated in this study. Out of 210 subjects, 7.1% (n=15) severe thinness, 12.4% (n=26) were thinness, 48.1% (n=101) were normal body weight, 18.6% (n=39) were overweight and 13.8% (n=29) were obese. The results showed that, only 11.9% subjects consumed 2 servings of fruits, while 10.0% subjects consumed 3 servings size of vegetables daily. The mean BMI of subjects who consumed 2 servings of fruits in a day were lower (19.86 ± 4.19 kg/m^2) than subjects who never consumed fruits (20.86 ± 4.47kg/m^2). The correlation between BMI and serving size of fruits (r=-0.056), was not significant (p=0.472). While mean BMI of subjects who consumed 3 servings of vegetables in a day were lower (19.20 ± 4.41 kg/m^2) than subjects who never consumed vegetables (20.88 ± 4.54kg/m^2). Mean BMI of the subjects were not significantly correlated with the serving size of vegetables (r=-0.027, p=0.693). Out of 210 subjects, 69% subjects were strongly agreed that they consume fruits because of its taste. While 50.0% of subject were strongly agreed that increase consumption of vegetables because of role model from their parents. In conclusion, the study found that, subjects who consumed fruits and vegetables in recommended serving size have lower BMI.

B07 Relationship between healthy eating index with socio-demographic factors and weight status among Chinese adults in Kuala Lumpur

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The objective of this study was to determine the relationship between Healthy Eating Index (HEI) with socio-demographic factors and weight status among Chinese adults in Kuala Lumpur. HEI was used to assess the overall diet quality of the population. Cross-sectional study of dietary assessment involved 165 Chinese adults aged 19 to 59 years old living

in DBKL flats. Subjects were asked to fill in the socio-demographic form and their 24-hour dietary recalls were interviewed. Anthropometric measurements on weight, height, waist circumference and body fat percentage were measured. Male subjects showed to have significantly higher BMI (24.3 ± 3.6 kg/m^2; $p<0.05$) and waist circumference (87.8 cm ± 11.2; $p<0.001$) whereas female subjects have significantly higher body fat percentage (31.2 ± 6.8 %; $p<0.001$). The overall diet quality in this study belongs to the category of diet "requiring improvement" with a mean HEI score of 51.8 $\pm$ 9.7. 48.5% subjects belong to bad diet quality whilst 51.5% subjects' diet quality required improvement. Female subjects significantly scored higher than male subjects (53.1 $\pm$ 10.1; 49.8 $\pm$ 8.9; $p<0.05$) and the test scores were positively associated with each other ($r^2=0.028$; $p<0.05$). Besides, subjects with a higher income also scored higher than those with lower income. Income showed a significant correlation with HEI score ($r^2=0.028$; $p<0.05$). Subjects who are underweight significantly scored lower (41.7 ± 7.6; $p<0.001$). Moreover, the percentage of HEI score was significantly higher among subjects with a moderate body fat percentage (53.9 ± 9.1; $p<0.05$). Regression analysis showed that BMI was significantly related with HEI score ($r^2=0.138$; $p<0.01$). In conclusion, this study indicated that a majority of the Chinese adults needed to improve their diet quality. Thus, it is suggested that dietary guidelines should be promoted to empower the population towards balanced and healthy nutritional pattern.

B08 Calorie labeling and food selection among consumers at selected fast food restaurants

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Nutrition labeling in restaurants for consumers may help combat the rising epidemic non-communicable diseases such as obesity. The purpose of this study was to determine the knowledge and utilization of calorie labeling or nutrition information among consumers at selected fast food restaurant. This study was conducted at two selected fast food restaurants located in Klang Valley during selected lunch and dinner hours. An adapted questionnaire comprised of basic demographic questions, height and weight information for BMI calculation and six close-ended questions related to the daily energy requirements, frequency of weekly fast food restaurant visits, meal calorie estimation, provision of nutritional information or labeling, consumer's attention to the nutritional information provided and factors affecting purchasing decision was used to collect data from consumers. A total of 125 respondents (55 females, 70 males) aged 18 to 65 participated in the study. Respondents who estimated their daily energy requirements within 100 calories range of the actual daily requirement recommended by Ministry of Health Malaysia was categorized as correct estimation. Majority of the respondents (69%) did not notice the nutrition information provided at the selected fast food restaurant. Furthermore, 42% of the respondents underestimated their daily energy requirements whereas 44% of them did not know the total calorie of their purchased meal. Majority of the male respondents underestimated their daily energy requirements ($p=0.003$) compared to females. Respondents who have higher frequency of weekly physical activity is more accurate in the daily energy requirements estimation ($p<0.001$) and read the nutritional information or labels more often ($p=0.001$). The top three influencing factors on meal purchasing decision were taste preference (37%), price (29%), and nutrition (24%). Overall, effective public education is needed to educate consumers on utilizing nutrition labels provided by the fast food restaurants and at the same time convey knowledge on daily energy requirements.

B09 Eating habits and risk of eating disorders among young Malay adolescents aged 10-14 years in Kuala Lumpur

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Eating disorders and eating habits has been linked but literature is scarce especially in Malaysia. This study aimed to determine the relationship between eating habits and risk of eating disorders among adolescents aged 10 to 14 years. A total of 193 adolescents (92 boys; 101 girls) were recruited from secondary schools in Kuala Lumpur. Questionnaires were used to obtain socio-demographic data and eating habits, while Eating Disorder Inventory-C (EDI) was used to assess risk of eating disorders. Mean age of boys and girls were 11.7 ± 1.4 years and 11.9 ± 1.2 years, respectively. Anthropometric measurements included body weight, height, and weight circumference. Body weight, height and waist circumference were 41.9 ± 15.4 kg, 144.8 ± 11.1 cm and 65.3 ± 13.4 cm for boys, and 41.4 ± 11.2 kg, 146.1 ± 8.1 cm and 63.0 ± 10.8 cm for girls, respectively. Results indicated that adolescents with risk of eating disorders ate regular meals (Chi-square=4.642; $p<0.05$) and practised the habit of eating while watching television or computer (Chi-square=4.435; $p<0.05$). Positive correlations were found between home-prepared meals with interpersonal distrust ($r=0.17$, $p<0.05$) and with social insecurity ($r=0.15$, $p<0.05$); and afternoon tea snacking was correlated with impulse regulation ($r=0.15$, $p<0.05$) of the EDI subscales. Frequency of family meals were also found to be negatively correlated with interoceptive awareness of EDI subscale ($r=-0.189$, $p<0.01$). However, frequency of breakfast, fast food, fruits and vegetables as well as sweetened beverage consumption did not show any correlation with risk of eating disorders. In conclusion, certain eating habits of adolescents in this study were shown to be associated with risk of eating disorders, while others did not. These results suggest that prevention of eating disorders should emphasize inculcating healthy eating habits among adolescents.

B10 Nutritional Supplement Consumption, Perceived Psychological Status and Quality of Life among University Students

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A cross-sectional study was conducted among students of Universiti Sains Malaysia (USM) to examine the relationship between nutritional supplement consumption, perceived psychological status and quality of life. A total of 494 participants aged 19-24 years were participated in the study, and self-administered questionnaire were delivered to the respected subjects. The questionnaire included information about subjects' socio-demographic, health behaviour, health status, and social support. Nutritional supplement consumption pattern was assessed through a food frequency questionnaire. Psychological status was evaluated using the Depression, Anxiety and Stress Scale-21 (DASS-21) and Rosenberg Self Esteem Scale (RSES), while a brief version of WHO Quality of Life (WHOQoL-BREF) was employed for QoL assessment. Results revealed that vitamin C was the most popular nutritional supplement (60.5%) among the students. The prevalence of depression, anxiety, stress and low self-esteem were 42.5%, 69.6%, 30.2% and 17.6%, respectively. Meanwhile, 19.4%, 20.4%, 10.3% and 13.8% of the students demonstrated poor quality of life for the physical, psychological, social and environment domains, respectively. In

particular, psychological status was inversely correlated with QoL (r=0.439; p<0.01). No significant difference was reported among supplement users and non-users in term of psychological health and QoL. The study highlighted the need to implement preventative measures to delay or reverse the poor psychological status among university students. Collectively, good psychological health is pivotal for university students to preserve and maintain a proper quality of life for preparation of their professional careers.

B11 Nutrition Information Panel (NIP): Knowledge, attitude and practice (KAP) among adults in Kuala Langat, Selangor

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The objective of this study was to determine the level of knowledge, attitude and practice (KAP) of reading nutrition information panel (NIP) and its relationship between socio-demographic and nutritional status among adults in Kuala Langat, Selangor. The study subjects were recruited among adults aged between 18-59 years old from 4 different villages in Kuala Langat. A total of 139 subjects with 39 men and 100 women participated in this study and completed a self-administered questionnaire. The questionnaire comprises of 23 questions on knowledge, attitude and practice of reading nutrition information panel (NIP). The anthropometrics parameters were also measured in this study. The study found that, most of the subjects were older adults (59.7%) and Malays (69.0%) ethnics. The total score of KAP was found to be higher in men (67.43%±18.67) compared to women. However, mean knowledge (59.67%±29.32) was higher in women. The results showed 29.5% of subjects had good KAP, followed by 52.5% moderate and 18.0% low level of KAP. According to BMI status, the mean score of knowledge (70.83%±27.82) and attitude (93.75%±17.68) were found to be higher in underweight group. While normal weight group had higher practice score (64.9%±28.85). The results showed weak negative correlation between BMI and knowledge (r=-0.177, p<0.05), attitude (r=-0.215, p<0.05) and practice (r=-0.168, p<0.05). Therefore, this study concludes that knowledge, attitude and practice of reading NIP may associate with BMI status and further study is needed to determine its association.

B12 Associations of family mealtime frequency, atmosphere and dietary intake on the body weight status of primary school children in Seremban, Negeri Sembilan

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The objective of this study was to examine the associations of family mealtime frequency, atmosphere and dietary intake on the body weight status of primary schools children in Seremban, Negeri Sembilan. This is a cross-sectional study which involved children of aged 9-12 years old from National Primary Schools in Seremban. Family mealtime questionnaire was used to measure the frequency of family meals, types of food prepared or served, how child is fed, atmosphere of family mealtimes, adult satisfaction, parent characteristics and potential barriers whereas a 24 hour dietary recall method was used to measure the dietary intake. Height and weight were measured and body mass index (BMI) was calculated. A

total of 182 parent-children pairs completed the survey. From the analysis, the prevalence of childhood overweight and obese found was 17.6% and 13.7% respectively. More female (19.39%) children were reported to be overweight than male children (15.48%) whereas more males (17.86%) were reported to be obese than females (10.20%). There were no significant difference found in body weight status according to children's age (x^2= 8.013, p= 0.533), gender (x^2= 2.415, p= 0.491) and ethnicity (x^2= 15.819, p= 0.070). No relationship was found between dietary intake and children's BMI (r= 0.064, p=0.390). No relationship was found between family mealtime with children's BMI and dietary intake. In conclusion, family mealtime, atmosphere and dietary intake was found to have no associations with the children's body weight status. The present study has predominantly focused only on children aged 9-12 years old and of a relatively small sample size. Therefore, future research should then involves a larger sample size, widens the study location and age group in Negeri Sembilan.

B13 A study of walking and food intake among female food science students in UKM

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Physical activity and food intake are interrelated. This study was conducted to determine the amount of walking steps per day and the food intake pattern among female students of Food Science Program in UKM. A total of 60 female students (30 Malays and 30 Chinese) were recruited. They were required to wear pedometer to measure the number of steps taken every day. They were also given a set of questionnaires containing a form to record the number of steps taken every day, the food frequency questionnaire (FFQ) and 24-hour dietary recall form. The data obtained was analyzed using SPSS version 21.0 and Nutrical software. Results showed that the average energy intake for Malay subjects (1453.50 ± 476.4 kcal) was higher than Chinese subjects (1237.62 ± 477.5 kcal). The data obtained showed no significant difference for both subjects on weekdays or weekend. For Malay subjects, the average energy intake on weekdays (1471.45 ± 504.4 kcal) was higher than weekend (1435.56 ± 631.3 kcal). Meanwhile, the average energy intake for Chinese subjects was higher on weekend (1324.81 ± 836.7 kcal) than weekdays (1150.44 ± 364.4 kcal). The average number of steps taken was higher on weekdays for both Malay (8660.517 ± 3877.76527) and Chinese (8836.0833 ± 2982.22982) subjects, compared to weekend. The average number of steps and energy intake of subjects on the weekend were positively correlated (r = 0.46, p = 0.00). However, no significant difference observed for weekdays (p = 0.11). It can be concluded that energy intake was higher with higher activity level among female students studied.

B14 Fruits and vegetables intake among Malay primary school children in Kuala Selangor

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The objective of this cross-sectional study was to determine between fruits and vegetables intake among Malay primary school children in Kuala Selangor. There were 248 primary school children (boys = 88, girls =160) aged 10 and 11 years old participated in this study. The study locations were divided into urban and rural area based on information

from District Department of Education. The assessment tools include socio-demography data and fruit and vegetable intake questionnaire. Food intake was evaluated by face-to-face interview with 2 days diet recall. Anthropometric measurements consisted of weight, height, body fat percentage, waist circumference and body mass index (BMI) were measured. Overall, 51.6% consumed fruits and 34.7% consumed vegetables 2 to 3 days per week. Only 24 subjects (9.7%) consumed fruits daily and 46 subjects (18.5%) consumed vegetables daily. The mean serving size of fruits intake is 0.9±0.6 servings and 0.8±0.4 servings for vegetables. The consumption of fruits and vegetables daily by the subjects were 62.5% and 52.2% respectively in the urban area, and 37.5% and 47.8% in the rural area. Majority of the subjects consumed fruits daily were from high income family (37.5%) while majority of the subjects consumed vegetables daily were from middle income family (41.3%). From the study, 91.7% subject consumed fruits and 89.1% subjects consumed vegetables daily because of parent's encouragement. 69.9% subjects consumed fruits daily and 50% subjects consumed vegetables daily reported that fruits and vegetables were ready to be served during mealtime. The mean BMI of the subjects who consumed fruits and vegetables were 18.4±5.1 kg/m² and 18.9±4.88 kg/m². There was no significant correlation between servings size of fruits($r=-0.144$, $p=0.154$) and vegetables ($r=0.097$, $p=0.351$) with BMI of the subjects. In conclusions, the study found low percentages on fruits and vegetables intake and has not met recommended servings size by Malaysia Dietary Guidelines.

B15 Perception and acceptance on School Supplementary Feeding Programme (SSFP)/Rancangan Makanan Tambahan (RMT) among parents in several primary schools in Kota Bharu

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A cross-sectional study to determine the parent perception, acceptance and knowledge on School Supplementary Feeding Programme (SSFP) was carried out. A total of 228 parents or guardians of children attending 5 primary schools with the implementation of SSFP in Kota Bharu were examined. The respondents completed self-administered questionnaires consisting of four parts: sociodemographic background, basic knowledge (12 items), perception (13 items) and acceptance on SSFP (12 items). Statistical analyses were performed using descriptive analysis, chi-square test, point scales and Bloom's cut off point. Results showed that, majority of the respondents were mothers, aged between 41 to 50 years old, Malay and live in rural areas. Most of them were housewife and have monthly income above than RM400 per month. They have high percentages level of knowledge scores on SSFP (92.5%). They also have high percentages level of perception and acceptance score on SSFP which 82.9% and 88.2% respectively. It was also found that there were significant association between perception and acceptance ($\alpha = 0.000$), perception and knowledge ($\alpha = 0.000$) and acceptance and knowledge ($\alpha = 0.000$). In conclusion, parents have high knowledge, perception and acceptance on SSFP conducted by government in primary schools. Most of parents were aware of the aims of the programme and the benefits that resulted to their children and to themselves as well.

B16 Factors associated with eating behaviour among secondary school students in Klang

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This cross-sectional study determined the factors associated with eating behaviour among 220 school going adolescents (50.9% males, 49.1% females) aged 16 years from one secondary school randomly selected in the Klang school district. Body image perception, dietary behaviour, physical activity and eating behaviour were assessed using Multidimensional Body Image Scale (MBIS), Dietary Behaviour Questionnaire, Physical Activity Questionnaire for Adolescents (PAQ-A) and the Eating Attitude Test–26 (EAT-26) respectively. Body height and weight were measured and body weight status was determined by categorizing BMI-for-age *z*-scores (BAZ) using WHO 2007 growth references. Among the respondents, 8.2% were severely thin, 19.1% thin, 49.5% normal, 15.9% overweight and 7.3% obese. As for the body image perception 5.5% of the respondents were in the highest tertile or most likely to have body image disturbances and 94.5% were in the moderate tertile. For dietary behaviour, 32.8% of the respondents had consumed carbonated drinks and 27.7% had skipped breakfast in the past 7 days. Also, 39.5% of the respondents were categoriesed in the low, 55% moderate and 5.5% in the high physical activity level. The overall prevalence of disordered eating was 45.9% (females 45%; males 46.4%). Significant relationships were found between dietary behaviour ($r=-0.174$, $p<0.01$) and body image ($r=0.137$, $p<0.05$) with eating behaviour. However, there was no significant relationship between body weight status and physical activity level with eating behaviour. Health intervention programs targeting disordered eating behaviour among adolescents should emphasize healthy dietary behaviour practices and positive perception of body image.

B17 Positive attitude but not knowledege is associated with nutrition fact label use among health students

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Nutrition fact label is required on most packaged food in many countries. The information on nutrition fact label includes serving size, percent daily value and nutrients such as dietary fiber, cholesterol, saturated fat and sodium. The purpose of this study was to examine the relationship between knowledge, attitude and practice of nutrition fact label use among undergraduates in health campus of Universiti Sains Malaysia. It was a cross sectional study that uses systematic sampling method to recruit the participants. A 448 self administered questionnaire which assess the nutrition knowledge, attitude and practice use of nutrition fact label was distributed and 401 returned (response rate of 89.5%). Female students contributed to 76.8% while male consisted of 23.2%. There were 38.9% of students from medical school, 13.5% from dental and 47.6% of students from health science school. Most students were Malay (69.2%), followed by Chinese (21.9%), Indian (7.1%) and other ethnic group (1.8%). The mean age of participants was 21 years old. The mean nutrition knowledge score of participants was 10.84, with majority of students (65.5%) having moderate knowledge level (9-12 score). There were 11.5%of students showing low knowledge level (0-8 score), while 22.9% of students showed good knowledge level (13-15 score). The mean attitude score of students was 79.83. Attitude score was slightly higher in female (79.92), compared to male (79.56). The mean score for nutrition fact label use was 29.29. Female showed a slightly higher label use score (29.44) than

male (28.79). Gender was not significantly associated with nutrition fact label use ($t=0.57$, $p>0.05$). There was no significant association between knowledge level and nutrition fact label use. Pearson correlation showed a significant correlation between attitude ($r=0.56$, $p<0.001$) and nutrition fact label use.

B18 Food insecurity and diet quality among Malay women from low income household in Kelantan

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Food insecurity generally happened in low income household and it would indirectly affect diet quality among underprivileged. This cross sectional study is to examine the impact of food insecurity towards diet quality among Malay women from low income household in Kelantan. A total of 132 women were recruited and their socio demography, physical activity level (PAL) and anthropometry data were recorded. Food insecurity was assessed through Radimer/Cornell hunger and food insecurity instrument. Moreover, their diet quality was evaluated using Healthy Eating Index (HEI), which has been adopted according to Malaysian Dietary Guidelines (MDG), in reference to their 3 days diet record (3DDR). Overall, majority subjects aged 40 to 49, housewife and possess high school education. Study results revealed that about 58.3% subjects encountered household food insecurity problem. Incidence of food insecurity is influenced by household income and number of children ($p<0.05$). More than half of the total subjects are overweight and obese, with mean BMI 28.0 ± 6.2 kg/m^2, despite most of them are physically active. Overall, majority subjects' diet qualities fall in the category of "need improvement", with mean HEI score 51.7 ± 8.3%. It has been identified that most of the subjects did not conform to the recommended dietary intake of legumes, milk and dairy products, fruits, sodium and vegetables. There was a statistical significant between HEI score and household food insecurity ($p<0.05$), but not for age, education level, household income, household expenses and BMI. Higher HEI score are found in women who are from food secured household compared to their counterparts. Rural residents consumed mostly unhealthy food due to economic constrain. Understanding the factors that contribute to poor dietary intake is crucial in order to improve diet quality among low income group.

B19 Influence of socio-demographic status, parental characteristics, and dietary and lifestyle practices on sugar-sweetened beverage consumption among Chinese preschoolers in Kota Bharu, Kelantan

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Higher consumption of sugar-sweetened beverages (SSB) exerts significant adverse effects on excessive weight gain and health risks among growing children. However, there is very limited data on the determinants associated with SSB consumption in children. Therefore, the aim of the study was to assess the influence of socio-demographic status, parental characteristics, and dietary and lifestyle practices on the SSB intakes among 211 Chinese

preschooler boys and girls aged 3 and 6 y in Kota Bharu, Kelantan. Pre-piloted parental questionnaires were used to assess dietary and lifestyle practices, and anthropometry was used to assess both in preschoolers and their parents. Mean age of participants were 4.8 ± 1.1 y, with about 43.6% and 47.4% of them were classified as normal BMI and thinness, respectively. Mean weekly intakes of SSB was 2.6 ± 3.6. Adjusted correlation analysis showed that higher SSB consumption in a week was significantly associated with higher levels of household income (p<0.05) and daily screen-based sedentary duration (p<0.05), whereas inverse association between SSB levels and weekly servings of vegetables was found (p<0.01), after adjusting for age, gender, both parental BMI and household size. A stepwise multiple linear regression analysis, by including all socio-demographic status, parental characteristics, and dietary and lifestyle factors in the analysis models, it found that higher frequency of snacking emerged as independent positive determinant on weekly SSB intakes (β=0.216; p=0.022), whereas high serving of vegetables emerged as independent negative determinant of SSB consumption (β=-0.208; p=0.026). This present finding suggesting that unhealthy dietary and lifestyle practices, together with household income are significantly associated with higher weekly SSB consumption. Therefore, healthy dietary and lifestyle practices such as increase vegetable intakes and lower screen-based sedentary practices should be continuously encouraged among preschoolers during this critical period of growth.

B20 The consumption of breakfast cereals: Its association with nutritional status among children in Seremban, Negeri Sembilan.

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This cross-sectional study was aimed to determine the association between consumption of breakfast cereals (BC) and nutritional status among school children. A total of 196 children aged 10 to 11 years old (n=85 males, n=111 females) from five selected primary schools in Seremban, Negeri Sembilan participated in this study. Nutritional status was assessed by anthropometry measurements and daily calorie and nutrient intake. Antropometric measurements such as body weight, height and body mass index (BMI) were measured. Daily calorie and nutrient intake were evaluated by using a 3-days diet record. Consumption pattern of BC as well as sociodemography were gathered using pre-tested questionnaires. Majority of the subjects were Malay (60.7%), followed by Chinese (26.0%) and Indian (13.3%). Out of 196 subjects, 7.1% were underweight, 58.7% were normal body weight, 21.9% were overweight and 12.2% were obese. There were 101 subjects (51.5%) who often consumed BC and 98 subjects (48.5%) who never or seldom consumed BC. Among the subjects who consumed BC, 63.4% of them often consumed BC with milk. Chocolate-flavoured ready-to-eat BC (48.7%) was mostly preferred by the subjects, followed by ready-to-eat BC coated with honey (24.4%) and hot cereals (12.2%). The mean BMI of subjects who often consumed BC were lower (17.2 ± 2.9 kg/m^2) than subjects who never or seldom consumed BC (18.6 ± 4.4 kg/m^2). There was a significant negative correlation between frequency of BC consumption and BMI (r = -0.109, p<0.05). The frequency of BC consumption was positively correlated with daily intake of calorie, carbohydrate, dietary fibre, thiamin, riboflavin, niacin, vitamin C, calcium, folate and ferum (p<0.05). In conclusion, increased frequency of BC consumption contributed to decrease in BMI and increase in daily calorie and nutrient intake among school children in Seremban, Negeri Sembilan.

B21 Maternal awareness on the importance of folic acid consumption during pregnancy in Kota Bharu, Kelantan

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Neural tube defects (NTDs) are one of the most common congenital malformations in Malaysia which leads to stillbirth, infant mortality and serious disability. Folic acid supplementation during periconceptional period has been proven to be effective in preventing NTDs. The objective of this study is to determine the level of maternal awareness on the importance of folic acid consumption during pregnancy. A cross-sectional study was conducted at health clinics around Kota Bharu, Kelantan. There were 153 pregnant women (97% Malays) aged 18 to 42 years old recruited through cluster sampling. Respondents were interviewed using a questionnaire to determine their awareness, knowledge and attitude on folic acid. Dietary intake was estimated using 24-hour dietary recall. All the respondents (100%) reported ever heard of folic acid, but only 41.8% of them knew the importance of folic acid in preventing NTDs. Majority (90.8%) of the respondents took folic acid supplements but only 15.5% of them taking it during periconceptional period. Awareness and knowledge were significantly associated with higher education level ($x2 = 10.225$, $p = 0.003$). It is also significantly higher among respondents with high monthly household income ($t = 2.281$, $p = 0.024$). The mean calorie intakes were ranging from 1450.6 ± 461.6kcal in 1st trimester to 1654.4 ± 533.4kcal in 3rd trimester where it is lower than the RNI Malaysia for pregnant women. This study shows that intake of vitamin A, vitamin C, vitamin B_1, vitamin B_2, niacin, folate and iron were higher than RNI Malaysia due to supplementation. In conclusion, the awareness on the importance of folic acid in preventing NTDs is still low in Kelantan and only a small proportion of respondents consumed folic acid supplements before pregnancy. Therefore, health policy or strategy has to be adopted by policymakers to increase the awareness on folic acid consumption in Kelantan.

B22 Intake level of carcinogenic charcoal-grilled foods among Kota Kinabalu local community

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Kota Kinabalu is famous with charcoal-grilled foods such as chicken wing, coccyx, liver, satay, fish, and sausages. Consumption of high amount of carcinogenic foods from charcoal-grilled cooking techniques is well-known will increase the chances of cancer cell proliferation. The aim of this research is to determine the level of intake and knowledge of people in Kota Kinabalu on charcoal-grilled foods and to have statistical data on the relation of carcinogenic food intake with cancer disease. The research was done in six areas around Kota Kinabalu using questionnaire research method, comprises four sections A, B, C and D which are demographic, charcoal-grilled food intake, history of medical illnesses, and general knowledge on carcinogenic food intake respectively. There are 364 respondents (male=199, female=165) involved in this research which comes from different level of age (20 to > 50 year old), ethnic groups and education level. As result, it shows that local community in Kota Kinabalu like to eat charcoal-grilled foods especially chicken wings, satay and barbecued fish in less than once a month (n=122) or two to five times a week (n=106). Demographic data is being correlated with frequency of respondents that consumed charcoal-grilled foods and marital status shows significant result ($p<0.05$). The level of knowledge on carcinogenic foods and its effect on cancer cell proliferation among people in Kota Kinabalu is still very low and this can be related to the respondent's level of education. However, the awareness on the effects of carcinogenic food towards cancer cell proliferation within Kota Kinabalu local community is still at low level.

B23 Association of whole grain consumption pattern with body weight status among rural adolescents in Kuala Selangor

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This cross-sectional study aimed to determine the relationship between the whole grain consumption with body weight status among rural adolescents aged 13 to 14 years old in Kuala Selangor. The study was carried out among 296 subjects involving 137 boys and 125 girls. Food frequency questionnaire (FFQ) and 2 days diet recall were used to evaluate the whole grain consumption. Anthropometric measurements such as weight, height, BMI, waist circumference and body fat percentage were taken. 13.9% boyss and 15.7% girls were overweight whereas 18.3% boys and 20.1% girls were obese. About 37.2% boys and 11.3% of girls adolescents had high body fat percentages. The results showed that the top five whole grain foods consumed by the adolescents were whole grain bread (52.6%), oat biscuits (47.0%), popcorn (47.0%), breakfast cereals (43.8%) and whole grain pasta (40.5%). Malay adolescents consumed popcorn (50.7%), whole grain breads (47.3%), breakfast cereals (37.8%), oats (37.2%), and whole grain pasta (32.4%). Chinese adolescents consumed oat biscuits (77.8%), breakfast cereals (72.2%), whole grain pasta (55.6%), cereal drinks (55.6%) and whole grain bread (38.9%). While Indians consumed whole grain breads (73.5%), oat biscuits (65.3%), whole grain pasta (59.2%), oats (53.1%) and breakfast cereals (51.0%). Mean whole grain servings per day consumed by the adolescents was 0.8 serving. Only 7.9% of adolescents fulfilled the recommendation for whole grain according to MDG which is 2 to 4 servings per day. The Spearman's rho correlation showed there were low positive correlations between whole grain consumption with BMI ($r=0.156$, $p<0.05$), waist circumference ($r=0.152$, $p<0.05$) and body fat percentage ($r=0.146$, $p<0.05$). In conclusion, whole grain consumption among the adolescents in Kuala Selangor was below satisfactory and did not meet the recommendation of the Malaysian Dietary Guideline. Intensive nutrition education and interventions are needed to increase whole grain intake among adolescents.

B24 Effect of television (TV) viewing hours, consumption of energy density of food and drinks while watching TV on weight status of working adults

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Obesity, a global pandemic threatens the health of people, reducing the quality of life and becomes a burden on the health care cost. Various factors are closely linked to overweight and obesity such as television viewing hours, physical activities, sleep quality, stress levels and food choices. The objective of this cross sectional study was to determine the effect of television (TV) viewing hours, energy density of food and drinks while watching TV on weight status of working adults. Multidimensional questionnaires were used to collect the data on demographic variables, TV watching hours, energy density of food and drinks consumed while watching TV. Weight status was determined using Body Mass Index (BMI) and waist-hip ratio (WHR). A total of 110 subjects volunteered for this study. The average age of the subjects recruited was 37±1.12 with an age range of 22-63 years old. About 54.5% were males and the remaining were females (45.5%). Majority (35.5) of respondents were

obese and 28.2% were overweight. During weekends, 62.7% of the participants watched TV for more than two hours. Most (40.9%) respondents reported that they consumed water while watching TV. Majority (33.6%) of the respondents claimed that they consumed energy dense foods while watching TV. Those who watched TV less than or equal to 2 hours during weekend were 3.3 times more likely to have a normal weight compared to those who watched TV more than 2 hours (OR= 3.3, 95% CI 1.451-7.419). This indicates that lesser screen time may reduce the consumption of energy dense foods which in turn would prevent overweight and obesity in the long run.

B25 Dental caries, BMI and sugar consumption among school going children in Cheras, Kuala Lumpur

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Dental caries is a multi-factorial disease with diet and nutritional status as common risk factors. Caries prevalence has been claimed to be improved in developed countries, still it remains prevalent and is increasing in some developing countries. This study aimed to assess the association between nutritional status, sugar consumption and dental caries experience in 7 to 11 years old children in Cheras, Kuala Lumpur. A cross-sectional study involving a convenience sampling was done among 312 participants comprised of 131 (42.0%) males and 181 (58.0%) females. Information collected were participant's socio-demographic characteristics, nutritional status, level of sugar consumption, oral-health behaviour, and dental caries index (DMFT/dmft). More than half of the participants had normal body weight with mean Body Mass Index (BMI) of 19.98±4.12 kg/m^2. The mean level of sugar consumption per day was 31.81±4.24g. Caries prevalence for primary and permanent dentition was 44.6% and 7.4% respectively. A high percentage of participants (75.3%) practiced brushing teeth two or more times per day. Results showed a significant association between child's age and caries experience, while other socio-demographic characteristics were not significantly associated with caries experience. This study revealed BMI and level of sugar consumption per day were insignificantly associated to dental caries. Present findings suggest that socio-demographic characteristics, level of sugar consumption and nutritional status were not significant predisposing factors in dental caries as the disease concerned of other risk factors. Still it is important to educate children to practice good dietary habit and proper oral-health behaviour for a healthy living.

B26 Dietary intake, physical activity, perceived stress, weight teasing and its association with body weight status among secondary school students in Hulu Langat District of Selangor

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The aim of this study was to assess dietary intake, physical activity, perceived stress and weight teasing among secondary school students in Hulu Langat District of Selangor. A total of 455 adolescents from five secondary schools, aged 13-16 years old were recruited through random cluster sampling. One-day dietary intakes were measured using 24-hour diet recall. Total energy and macronutrient were compared with Recommended Nutrient Intake (RNI) value. Body weight and height were measured and BMI-for-age was calculated. Data were collected using a set of self-administered questionnaires included

Physical Activity Questionnaire for Adolescents (PAQ-A), Perceived Stress Scale (PSS) and Perception of Teasing Scale (POTS). Most of the respondents were Malays (69.9%), followed by Chinese (17.1%), Indian (12.5%) and others (0.4%). Majority of the respondents (64.4%) had normal BMI-for-age, while 6.0% and 30% were classified as severe thinness/thinness and overweight/obese respectively. Mean physical activity score was 2.51 ± 0.67 with 30.0% of male being physically more active than female (21.0%). On average, total energy intake was 1614 ± 639 kcal/day. Compared with RNI value, 82.6% (N=376) and 47.5% (N=216) of respondents had lower total energy and protein intake respectively. A significant correlation was found between weight teasing ($r=0.514$, $p<0.000$) and perceived stress ($r=-0.097$, $p=0.04$) with body weight status. There were significantly different in total energy ($t=4.555$, $p=0.000$), carbohydrate ($t=3.781$, $p=0.000$), protein ($t=3.846$, $p=0.000$) and fat intake ($t=4.153$, $p=0.000$) between obese and non-obese respondents. Even though mean energy intake was lower than RNI, the prevalence of obesity was very high in this study. This could be explained by under reporting by the respondents. The result showed body weight status was linked with dietary intake, weight teasing and perceived stress. Therefore, these findings warrant for a holistic approach of intervention programmes among school-aged students in order to curb the overweight and obesity among adolescents.

B27 Food insecurity, nutritional status and dietary behavior in People's Housing Project (PHP) at Kg Muhibah, Puchong, Selangor

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Household food insecurity is a state of having limited access to sufficient supply of food at household level that concern with the adequate nutrition and well-being. This study was conducted to determine the prevalence of food insecurity, nutritional status and dietary behavior among women in People's Housing Project (PHP) Kg. Muhibah, Puchong, Selangor. A total of 88 women were recruited through convenience sampling and interview-administered questionnaires were used to obtain information on socio demographic background, food security status, nutritional status and dietary behavior. Food security status was determined by Radimer/Cornell hunger questionnaire. Two days 24-hour dietary recall was used to determine dietary intake. Anthropometric measurements were collected and Body Mass Index (BMI) as well as waist circumference (WC) were determined. Results indicated that, majority of the respondents (83.00%) were classified as food insecure. Mean of total energy, carbohydrate, fat and protein intake were 1513.13±725.30 kcal, 198.06±77.24g, 58.25±22.53g, 48.48±22.19g, respectively. There were 65.91% and 50.0% of respondents meet the recommendation of energy intake and protein based on Recommended Nutrient Intakes for Malaysia (RNI). Means of BMI and WC of the respondents were reported at 27.45±6.13 kgm^{-2} and 88.61±13.06 cm, respectively. Among the respondents, 63.60% of them were classified as overweight and obese. In term of dietary behavior, "Substituting Manufactured Low Fat Food" factor has the highest mean score (3.52±0.67) followed by "Replacing High Fat Foods with Fruits and Vegetable" factor (2.89±0.63), "Avoiding Fried Foods" factor (2.66±o.63), 'Avoiding High Fat Food" factor (2.32±0.56) and "Modifying Meat to be Low in Fat" factor (1.96±0.92). There were significant differences between mean intake of vitamin C ($F= 5.50$, $p=0.02$) and vitamin E ($F= 4.94$, $p= 0.03$) based on food security status. In conclusion, food insecurity is the major problem among PHP households. The high prevalence of food insecurity suggests an urgent need for action to improve the food security status among PHP households.

B28 Factors associated with binge eating behaviour among adolescents aged 13-16 years old in Kajang, Selangor

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This cross-sectional study aimed to determine the associations between socio-demographic characteristics, family factors, psychological factors and body weight status with binge eating behaviour (BEB) among 13-16 years old adolescents in Kajang. A total of 356 adolescents (42.7% boys and 57.3% girls), aged 14.3 years (SD = 1.0) from a secondary school in Kajang participated in this study. They completed a self-administered questionnaire on socio-demographic background, family meal patterns (frequency of family meals), family meal environments (priority, atmosphere, structure/rules), family cohesion, perception of body size, self-esteem, depression, perfectionism and BEB. Binge eating behaviour was measured using the Binge Eating Scale (BES). Weight, height and waist circumference were measured by the researcher. More boys (30.2%) were overweight and obese than girls (26.0%). About 14.0% of the respondents had BEB, with more girls (15.2%) engaged in this behaviour than did boys (12.5%). Girls (M = 10.93, SD = 6.06) showed significantly higher binge eating scores as compared to boys (M = 9.51, SD = 6.53), t = -2.116, p = 0.035. Family cohesion (r = -0.244, p < 0.001), body size perception (r = 0.186, p < 0.001), self-esteem (r = -0.243, p < 0.001), depression (r = 0.263, p < 0.001), BMI-for-age (r = 0.127, p = 0.016) and waist circumference (r = 0.154, p = 0.004) were correlated with BEB. No significant associations were observed between family meal environment and perfectionism with BEB. This study shows the need for nutrition intervention programs to include these factors in the prevention of binge eating behaviour among adolescents. Counsellors, nutritionists, and healthcare providers should work together in order to raise awareness of the unhealthy eating behaviours and poor nutritional status among adolescents.

B29 Fish consumption patterns among adults of different ethnics in Peninsular Malaysia.

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Understanding different patterns of fish consumption is an important component for risk assessment of contaminants in fish. Few studies on food consumption had been conducted in Malaysia, but none of them focused specifically on fish consumption. A cross-sectional survey with two-stage stratified-cluster sampling was conducted to investigate patterns of fish consumption among Malaysian adults of different ethnicity in Peninsular Malaysia. A total of 2,675 subjects comprised of male (44.2%) and female (55.7%) of major ethnics (Malays-76.9%; Chinese-14.7%; Indians-8.3%) with the mean age of 43.4±16.2 years were studied from February 2008 – May 2009. Fish consumption data were collected using 3-day dietary record method. The results revealed ten most frequently consumed marine fish in descending order: Indian mackerel, anchovy, yellowtail scads, yellow-stripe scads, tuna, sardines, torpedo scads, Indian scads and short-fin scads. Prawn and squid were also among mostly preferred seafood by study subjects. Most frequently consumed freshwater fish was freshwater catfish. Mostly preferred cooking style by Malaysian was deep-fried fish, followed by fish cooked in thick and/or thin chili gravy and fish curry. Overall, Malaysian consumed the median of 168±140g/day of fish, with Malay ethnic (175±143g/day) consuming significantly (χ^2=16.253; p<0.001) higher amount of fish

compared to the other two ethnic groups (Chinese=153±134g/day, Indians=138±139g/day). Fish consumption was also significantly associated with age (χ^2=12.17; p=0.002), marital status (χ^2=36161; p<0.001), residential areas (χ^2=75.903; p<0.001) and years of educations of study subjects (χ^2=19.436; p<0.001).These data would be invaluable as it can be utilized later in the assessment of potential health risks hazards, mainly heavy metals in the populations of Peninsular Malaysia from consumption of fish/seafood.

B30 Hedonic ratings and consumption of breakfast among recruits in basic recruit training

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This research is to examine the relationship between hedonic ratings and the consumption of breakfast food during basic recruit training. Hedonic ratings of breakfast items belonging to 30 food items provided by the catering were collected from 50 recruits, over 2 months. All foods and drinks provided by the catering were rated from 1 (extremely disliked) to 9 (extremely liked), with a score of 5 set as acceptable score. During the subsequent breakfast, the leftovers of each individual and menu item were recorded. Hedonic responses to breakfast food items differed significantly [F (29) = 103.62, p<0.05]. 53.3% of breakfast food items were scored from 5.12 to 8.52. Honeystar cereals (score 8.52) and nasi lemak (score 8.10) were liked very much with more than 90% of consumption. The least liked breakfast food was kway teow soup with score of 1.58. A significant and high correlation was found between hedonic scores and food consumption of breakfast food items (r= 0.725) (p<0.05). In conclusion, hedonic ratings of recruits predicted the amount of breakfast consumption. Low ratings of breakfast food items raise the question on how the breakfast food should be served to encourage their consumption in recruits during training.

B31 Consumption patterns and perception of functional foods among Chinese women in Kota Bharu, Kelantan

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Functional Foods (FFs) which normally termed as "health foods" in Asian countries is experiencing rapid growing in the food industry. However, there is limited finding which determine Malaysians' perception and consumption patterns in this aspect. A study was carried out in Kota Bharu, the state capital of Kelantan with the main objective of examining the consumption patterns and perception of FFs among Chinese women. This was a cross-sectional descriptive study. A total of 372 women was recruited in this study by using cluster sampling whereby 3 Chinese schools in Kota Bharu were randomly selected. Respondents were either mother or female caregiver of the students from those selected schools. A self-administered questionnaire which includes socio-demographic characteristics, FFs information sources, consumption patterns, knowledge and perception regarding FFs was used to survey the response of respondents and data were analyzed using SPSS software version 21. The results obtained indicated that 51.1% and 71.2% of respondents have a moderate knowledge level and the perception level of FFs, respectively. Pearson Chi-Square test showed that consumption of probiotic product was dependent on educational level and marital status ($p \leq 0.05$); natural food was dependent on age, educational level

and monthly household income ($p \leq 0.05$) while functional beverage was dependent on educational level ($p \leq 0.05$). However, the results showed socio-demographic factors are not significant determinants of overall consumption patterns of FFs. There was no statistically significant association found between knowledge and perception level with consumption patterns in any FFs categories. In conclusion, the finding showed that educational level was a good determinant on FFs consumption, but further study is necessary to gain clearer understanding of the association between socio-demographic factors and the FFs consumption patterns.

B32 Children's soft drinks intake in family environment: a case study in Malaysia selected areas

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This study was aims to identify the relationship between home environmental factor and soft drinks consumption in Malaysia selected areas. About 632 respondents aged 7 to12 and their parents participated in this study. Questionnaire has been used to collect information directly from children. Ordinary Least Squares Regression was used to test the relationship between home environmental factor and soft drinks consumption among the children. The results show that 98.7% of respondents consume soft drinks regularly, and 1 can to 2 cans (58.9%) per day, equal to 7 to 14 teaspoons of sugar. Data collected also shows that respondents from moderate income families (RM2501-RM3000) are more likely to consume compared to those from higher income families. Based on result, 54.3% of respondents received information about soft drinks through their friends and family members. The results also shown that 67.1% of parents allow their children consume soft drinks. About 34.4% of respondents consume soft drinks more than their parents' expected and 40.2% of parents can figure out correctly the number of soft drinks consume by their children per week. Moreover, 70.2% of respondents would take the same types of canned drinks with their parents. (T=-0.602). The respondents also reflected that they can easily obtain canned drinks from their houses and it is coefficient with the number of soft drink consumption (T=0.001). Parents should be the main target for education to control children soft drink consumption. Parents have to strict control over what kind of beverage children consume.

B33 TMPRSS6 (rs855791) polymorphisms in relations with haemoglobin levels, maternal medical history, socioeconomic factors and dietary intake among pregnant women attending antenatal clinic in Jerantut, Pahang

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Anaemia is a specific condition where red blood cells could not provide adequate oxygen to the body tissues. Anaemia affects pregnant women of both developing and developed countries. Iron-deficiency anaemia occurs when the haemoglobin (Hb) concentrations dropped to below optimal levels due to iron deficiency. This study aims to determine

the maternal medical history (including parity, gravidity, miscarriage, premature born, anaemia before and during pregnancy), dietary intake (including food avoidance, vegetarian, haematinic supplement intake, and weekly food intake), socioeconomic factors and haemoglobin levels in relation with mutation in TMPRSS6 (rs855791) among pregnant women attending an antenatal clinic in Jerantut, Pahang. A total of 25 pregnant women (18 Malays, 4 Chinese and 3 Indians) were enrolled. Blood samples were collected to genotype the rs855791 (V736A) polymorphisms while the Hb level was obtained from the clinical report of the pregnant women. Hb level of 110g/l or lower was considered anaemic.. Six out of the 25 respondents (24%) were anaemic in this study. Two Malays, two Chinese and one Indian were compound homozygous for V736A polymorphisms. Results of Fischer's exact test showed that none of the tested factors in this study was significantly related ($p<0.05$) to anaemic status. Case studies on the selected pregnant women with the mutant alleles showed two out of the seven pregnant women whom carrying the risk allele (homozygous AA) were anaemic. However, the effect of the risk allele A as being genetic risk factors for iron deficiency anaemia remains to be clarified. In conclusion, this study did not find out any relationship between factors studied and anaemic status during pregnancy. A study with a larger sample size is recommended to be carried out.

B34 Body image and disordered eating in Malaysian adolescents: findings from the Malaysian Overweight and Disordered Eating Survey among Teens (M.O.D.E.S.T)

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This study aimed to determine the relationship between multi-dimensional body image with disordered eating in Malaysian adolescents. A total of 9244 adolescents aged between 12 to 19 years were recruited from all states in Malaysia. The Eating Attitudes Test-26 and Multi-dimensional Body Image Scale (MBIS) were completed by the adolescents. The MBIS comprised seven dimensions, namely (i)perception of body size and shape, (ii)appearance and body satisfaction, (iii)extreme dieting behaviour, (iv)muscle increasing behaviour, (v) preoccupation with thinness and dieting behaviour, (vi)appearance importance, and (vii) body importance. The prevalence of disordered eating was 30.8% (95%CI: 29.9-31.8), whereby 33.5% in males (95%CI: 32.0-34.9) and 28.8% in females (95%CI: 27.6-30.1). The mean total MBIS score and mean score of all MBIS dimensions were significantly higher in adolescents with disordered eating compared to those without disordered eating ($p<0.001$). Males and females shared most of the body image factors contributing to the disordered eating. For both males and females, those who have extreme dieting behaviour (males: OR:1.182, 95%CI:1.148-1.217; females: OR:1.121, 95%CI:1.082-1.162), muscle increasing behaviour (males: OR:1.066, 95% CI:1.052-1.080; females: OR:1.071, 95%CI:1.059-1.083), preoccupation with thinness and dieting behaviour (males: OR:1.044, 95%CI:1.037-1.051; females: OR:1.049, 95%CI:1.042-1.056), appearance importance (males: OR:1.019, 95%CI:1.002-1.035; females: OR:1.025, 95%CI:1.009-1.041), and body importance (males: OR:1.018, 95%CI:1.007-1.029; females: OR:1.034, 95%CI:1.023-1.046) were more likely to have disordered eating. Perception of body size and shape (OR:1.032, 95%CI:1.004-1.061) was the factor of disordered eating in males, but not in females. Meanwhile, appearance and body satisfaction (OR:1.009, 95%CI:1.002-1.015) was the factor of disordered eating in females, but not in males. The current study shows that body image that comprises multi-dimensional construct contributed to disordered eating in both male and female adolescents. Thus, future study on body image and disordered eating among adolescents should consider the multi-dimensional constructs of body image.

B35 Picky eating, food neophobia, and body weight status among preschoolers aged 4 to 6 years old in Tabika Perpaduan Tampin, Negeri Sembilan

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This cross-sectional study aimed to determine the relationships between picky eating and food neophobia with body weight status among preschoolers. A total of 201 preschoolers (54.2% boys and 45.8% girls) aged 4-6 years old and their mothers from all Tabika Perpaduan in Tampin (N=15) participated in this study. Mothers were interviewed to obtain information on socio-demographic background, parental feeding practices, parental feeding styles, infant feeding practices, picky eating, and food neophobia of their children. Height and weight of the preschoolers were measured. More than half of the preschoolers (53.2%) had high level of pickiness and 15.4% with food neophobia. The means picky eating score and food neophobia score were 10.44±3.18 and 40.80±8.42, respectively with no differences in both mean scores between sexes. One in five of the preschoolers (20.0%) were overweight/obese. A small proportion (4.5%) of them were thinness/wasted. Only perceived maternal weight (r=-0.034, p=0.006) and perceived child's weight (r=-0.254, p<0.001) showed significantly negative relationship with picky eating. Meanwhile, perceived child's weight (r=0.495, p<0.001), concern about child's weight (r=0.173, p=0.014), food monitoring (r=0.161, p=0.022), and pressure to eat (r=-0.268, p<0.001) showed significant relationship with BMI-for-age. Caregiver feeding style was significantly related with picky eating (r=0.150, p=0.034) and BMI-for-age (r=-0.223, p=0.001) but not food neophobia (r=0.115, p=0.103). Infant feeding practices were not related with picky eating and BMI-for-age. However, early introduction of any complementary food before 6 months showed significant association with food neophobia (χ^2=6.12, p=0.047). No significant relationships were found between picky eating (r=-0.089, p=0.207) and food neophobia (r=0.041, p=0.568) with BMI-for-age. Findings suggest that there was a direct relationship between parental feeding practices and style with picky eating and BMI-for-age. However, picky eating and food neophobia were not related with BMI-for-age.

B36 Disordered eating and non-disordered eating among male adolescents: comparison of psychological factors, dietary practices and physical activity

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Disordered eating becomes prevalent among male adolescents in recent years. However, there is no specific local study to determine its contributing factors to combat this problem. This study aimed to compare psychological factors, dietary practices and physical activity between male adolescents with disordered eating (DE) and non-disordered eating (NDE) in Hulu Langat, Selangor. Disordered eating screening was conducted in eight selected secondary schools to identify respondents with DE. Out of 532 respondents screened, 105 respondents (19.7%) were identified with DE and 95 of them were randomly selected and matched for age and ethnicity with 95 respondents with NDE. To assess psychological factors, dietary practices and physical activity, respondents completed Multi-dimensional Body Image Scale (MBIS), Depression Anxiety and Stress Scale (DASS), Rosenberg's Self

Esteem Questionnaire, Eating Behavior Questionnaire, two-day 24-hour dietary and physical activity recalls. The study sample (n=190) comprised Malays (53.7%), Chinese (30.6%) and Indians (15.7%), with mean age of 13.71±0.57years. Results showed that respondents with DE had higher risk of developing negative body image (mean total MBIS score=63.56±6.12) than their counterparts (56.81±7.12; t=7.013; p<0.001). More respondents with DE were overweight and obese (43.2%) compared to their counterparts (23.2%; χ^2=8.584; p<0.05). Mean intake of afternoon tea (3.60±2.75days/week) and supper (2.37±2.58days/week) was significantly lower among respondents with DE than their counterparts (afternoon tea=4.38±2.30days/week; supper=3.09±2.33days/week; p<0.05). Respondents with DE (2825±1088kcal/day) significantly expended more energy than their counterparts (2307±736kcal/day; t=3.844, p<0.001). Further, there were more respondents with DE (21.1%) were vigorously active compared to respondents with NDE (4.2%; χ^2=14.577, p<0.005). However, there was no significant difference in depression, anxiety, stress, self-esteem, total energy intake, frequency of meal skipping and fast food consumption between the groups of respondents. In short, one in five of the male adolescents had disordered eating. Body image, body weight status, dietary practices and physical activity were important factors to be targeted in preventing disordered eating among male adolescents.

B37 Do dairy products consumption influence cardiometabolic risk factors among young adolescents?

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Clustering of metabolic and clinical risk factors that predict the development of diseases, such as type 2 diabetes and cardiovascular diseases, are well established. Recent epidemiological studies suggested protective effects of dairy products consumption on the development of metabolic syndrome. Thus, this study was conducted to investigate the relationship between intake of dairy products and metabolic syndrome among young adolescents aged 10-14 years old. Anthropometric measurements comprised weight, height and waist circumference (WC). Blood pressure (BP) was taken, and fasting blood was tested for blood glucose and full lipid profile, including triglycerides (TG), high lipoprotein cholesterol (HDL-C), low lipoprotein cholesterol (LDL-C) and total cholesterol (TC). Consumption of dairy products was evaluated by using three-day dietary records (3DDR). The International Diabetes Federation 2007 criteria for children were used to identify metabolic syndrome. Subjects comprised 205 students of Malay ethnicity in Kuala Lumpur; and were grouped as dairy consumers (DC, n=78, 37.7%) and non-dairy consumers (NDC, n=127, 62.3%). Mean energy intake was 1502 ± 344 kcal in DC group versus 1441 ± 329 kcal in NDC group. NDC group was found to have larger WC (18.9%) and higher TG (6.3%) but lower HDL-C (10.3%) compared to DC group (16.7%, 3.8% and 7.9%, respectively). Systolic blood pressure was found to be significantly different (p<0.05) between the two groups. Metabolic syndrome exists in 2.4% of NDC group compared to 1.3% of DC group. Overall, higher proportions of adolescents in NDC group was found to have metabolic risk (1 risk factor 24.4%; 2 risk factors 2.4%; 3 risk factors 2.4%; 4 risk factors 0%) versus DC group (1 risk factor 16.7%; 2 risk factors 6.4%; 3 risk factors 0%; 4 risk factors 1.3%). However, no relationship was found between intake of dairy products with metabolic syndrome. In conclusion, this study could not show beneficial effects of dairy products consumption on metabolic syndrome. Further research involving larger sample size is likely needed to provide more concrete evidence on the association between dairy food consumption with metabolic syndrome.

B38 Nutrient intake during a nine-course Chinese style dinner

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The objective of this study was to examine macronutrient and sodium contributions from a nine-course Chinese dinner. Volunteers (n=18) were adults eating adlibitum in mock dinner situations in hotels between 2012 and 2013. Food served were the exact items served in real situations such as weddings and corporate dinners. Weighed records were used. Nutrient composition was estimated using DietPlus Version 2. Mean energy intake was 989.6 ± 291.7 kcal, protein 86.2 ± 39.1 g, fat 46.5 ± 17.5 g, carbohydrate 64.7 ± 16.7 g, and sodium 1935.4 ± 513.6 mg. In one meal, diners consumed 49.5 ± 12.6 percent of their total daily requirements, estimated as 2,000 kcal/day. Mean energy contribution from fat was 20.9 ± 7.9 percent. At the same time, volunteers consumed 84.1 ± 22.3 percent of the IOM Tolerable Upper Intake Level for sodium. The highest energy intake (173.0 ± 36.5 kcal) was from the first item in a typical nine-couuse menu, which is the Hot and Cold Combination Platter. This item also contributed the highest sodium intake, at 539.2 ± 278.8 mg. Chinese tea without sugar was the only beverage served. Therefore no additional macronutrient intake was derived from beverage. This pattern of consumption is of concern in adults with metabolic syndrome, particularly when frequency of such dinners is increased at the end of the year when most people host nine-course wedding feasts and companies host appreciation dinners for employees.

B39 Sun exposure, food intake and estimated vitamin D amount among adults in Kuala Lumpur and Selangor

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The aim of this study was to determine the estimated amount of vitamin D intake through sun exposure and diet among adults living in Kuala Lumpur and Selangor. A total of 117 adults (31 men; 86 women) of Malay, Chinese and Indian ethnicity participated in this study. Online questionnaire was used to assess sun exposure behavior and habitual intake of vitamin D rich food sources. Dietary intake of vitamin D was assessed using 3 days food diary. Subjects wore polysulphone UVB film badges for a week and they were analyzed by Perkin Elmer UV/Vis Lambda 2 Spectrophotometer to determine standard erythema dose (SED), and subsequently to estimate cutaneous synthesis of vitamin D. Men has significantly higher daily SED value than women (0.32 ± 0.22; 0.19 ± 0.12, $p<0.01$) and higher estimated cutaneous synthesis of vitamin D (7.16 ± 7.15 µg/d; 4.43 ± 5.10 µg/d, $p<0.05$) than their female counterparts. Mean daily SED value were not significantly different ($p=0.357$) among ethnicities: Chinese (0.25 ± 0.16), Malays (0.22 ± 0.16) and Indians (0.19 ± 0.13) but the estimated cutaneous synthesis of vitamin D was significantly lowest ($p<0.01$) in Indians (2.73 ± 1.82 µg/d), followed by Malays (4.13 ± 4.49 µg/d) and Chinese (7.21 ± 7.40 µg/d). Mean dietary intake of vitamin D was 2.84 ± 2.29 µg/d, which met only 57% of Malaysian Recommended Nutrient Intake. No difference in vitamin D intake was observed between the sexes and ethnicities. Overall, sunlight contributed 61% to total vitamin D intake and was the major source of vitamin D among Malaysian adults. We opine that Malaysians may need to consider taking more vitamin D rich food in their daily diet.

Group C: Nutrients And Other Components in Food/ Products

C01 The comparison of protein content and amino acid of locally processed and franchised hamburger patties

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The objective of this study was to determine the protein content and amino acid of locally produced and franchised chicken hamburger. Two local and two franchised hamburger patties were obtained from the supermarket and respective franchise chain. For the franchised hamburger only cooked patties were analyzed since the raw pattie was not available. The patties were homogenized and subjected to protein analysis using Kjeldahl method while the amino acids profiles were analyzed using the official method of AOAC. The result of the study indicated that the cooked patties contained significantly higher [P<.05) protein than its raw counter part. Local beef patties [A1] contained significantly higher protein content both in raw and cooked form compared to A2 [another local beef patties]. The cooked franchise patties contained significantly higher protein P<.05) than the cooked locally produced patties. The amino acid profile showed that franchised cooked beef patties contained all amino acids except glutamic acid while the threonine, glutamic acid, tyrosine and lysine were not detected in the locally produce beef patties.. The methionine content was significantly lower [p<.05] in locally produced patties [.30mg/g] compared to franchised patties which contained 4.4 mg methionine/g sample. The local patties seemed to be incorporated with some amount of soy protein which reflect the lower amount of methionine in the local beef patties.

C02 Nutritional quality of proteins extracted from the oil palm (*Elaeis guineensis*) kernel

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Plant proteins played essential roles in human nutrition. Palm oil was the most important oilseed crops globally. There was 12-16% of crude protein in oil palm kernel. However, little was known about the nutritional quality of the kernel protein. Hence, this study aimed to determine the amino acid profiles of the defatted kernel meal, extractable soluble fractions, protein isolate and protein hydrolysates from the kernel protein to ascertain its nutritional quality. The raw kernel meal was defatted before further analyses. The soluble protein fractions (globulin, albumin, glutelin) were obtained from Osborne fractionation while the

protein isolate used for the generation of protein hydrolysates was obtained by alkaline extraction and acid precipitation. Then, the oil palm kernel protein hydrolysates were produced by protease and pepsin-pancreatin hydrolysis. Amino acid profile was analyzed by Pico Tag Amino Acid Analyzer. The protein isolate and hydrolysates showed significantly better amino acids profile than all the extractable soluble fractions and the defatted meal where they were rich in essential amino acids. The percentage ratios of essential to total amino acids for the protein isolate and hydrolysates exceeded 36%, the level which was considered an ideal protein to meet the amino acid requirements for infants. Besides, they also met all the essential amino acid requirements of children, adolescents and adults according to WHO/FAO recommendations. The protein isolate and hydrolysates were rich in sulfur-containing amino acids (Cys and Met), Val and Lys, which were limiting in legumes and edible cereals like rice, corn, wheat and pecan. Thr was not detected in defatted meal and all extractable protein fractions in contrast to protein isolate and both hydrolysates where the amount was high. Results indicate that the protein isolate and hydrolysates produced from the oil palm kernel could be another cheap source of good protein for effective food utilization.

C03 Determination of phosphorus content in raw chicken and selected chicken processed foods

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Processed foods are usually added with inorganic phosphate additives to extend the shelf life, and this can increases the phosphorus intake of an individual by as much as 1 g/day. Over consumption of phosphorus can contribute to the situation of hyperphosphatemia in chronic kidney disease (CKD) patients whereas it can also affect bone metabolism and cardiovascular health in general population. The objective of this study is to determine the phosphorus content in raw chicken breast meat and selected chicken processed foods. The study also aimed to compare the phosphorus content in raw chicken breast meat and selected chicken processed foods. Raw chicken breast meat and three types of chicken processed foods (Chicken Frankfurter, Chicken Patty, and Chicken Nugget) from three different brands each were selected. Phosphorus content of the samples were analysed by using dry ashing method and Perkin-Elmer 5300DV inductively coupled plasma–optical emission spectrometer (ICP-OES). The samples were bought from supermarket and retail market in Serdang, Selangor. Results of chemical analyses showed that the chicken nugget has the highest mean phosphorus content (212.80±8.90 mg/100g), followed by raw chicken breast meat (209.15±3.13 mg/100g), chicken patty (199.08±15.96 mg/100g), and chicken frankfurter (164.36±20.64 mg/100g). The mean phosphorus content of chicken frankfurter and chicken patty was 21.42% and 4.81% lower than the raw chicken breast meat, whereas the mean phosphorus content of chicken nugget was 1.74% higher than the raw chicken breast meat. Similar chicken processed foods by different manufacturer showed different phosphorus content. In conclusion, excessive consumption of chicken processed foods with high phosphorus content should be avoided by CKD patients as well as the general population. Labelling of phosphorus content should be included in the nutrition facts labels and phosphate additives added should be listed in the ingredient list to enable a better understanding of the phosphorus content among the consumers and patients.

C04 Comparison of vitamin C content in citrus fruits by titration and high performance liquid chromatography methods

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Vitamin C, also known as ascorbic acid is one of the most important vitamins for human and animal. Hence, determination of vitamin C in food is very important. Many methods were developed for determination of vitamin C such as spectrophotometry, electrophoresis, titration, and high performance liquid chromatography (HPLC). The aim of this study was to compare vitamin C content of citrus fruits using two different methods. Citrus fruits (orange, grapefruit, lemon, lime, kefir lime and musk lime) were purchased from local hypermarket. Vitamin C in the fruit samples were determined by High Performance Liquid Chromatography coupled with photodiode array (HPLC-PDA) and compared with classic indophenol titration method. In the titration method, it was shown that orange has the highest vitamin C content (58.30 mg/100g) followed by grapefruit (49.15 mg/100g), lemon (43.96 mg/100g), kefir lime (37.24 mg/100g), lime (27.78 mg/100g) and musk lime (18.62 mg/100g). Whereas, in HPLC method orange also had the highest vitamin C content (43.61 mg/100g) followed by lemon (31.33 mg/100g), grapefruit (26.40 mg/100g), lime (22.36 mg/100g), kefir lime (21.58 mg/100g) and musk lime (16.78 mg/100g). Orange was the best source of vitamin C followed by grapefruit and lemon. While lime, musk lime and kefir lime have lower concentration of vitamin C. Statistically, there were significant differences in terms of vitamin C contents of samples by HPLC-PDA and classic indophenol titration methods. Both analytical methods were suitable for determination of vitamin C in citrus fruits, however the most preferred is HPLC due to its accuracy, precision and specificity.

C05 Determination of proximate and sugar composition of selected glutinous rice flour based Chinese snacks

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The proximate and sugar compositions of five Chinese snacks generally available in market namely *Heepan, Jian Dui, Ang Ku Kueh, Loh Mai Chi* and *Onde-onde* were studied to determine their nutritional values. Nutrient database of the snacks is essential as a reference for dietary studies and for consumers in making healthier food choice. Lacks of reliable nutrition information of the snacks puts consumers on nutritional risks urges the investigation of the snacks. All the analytical analysis was performed according to AOAC Official Methods (2006) except for available carbohydrate (by-different) and sugar composition determination by High Performance Liquid Chromatography. All the analysis carried out been tested by two or three independent laboratories and in duplicate or triplicate for each experiment. Total energy content of the studied snacks was calculated as summation of protein, fat, available carbohydrate and fiber content after a multiplication based on 4, 9, 4 and 2 kcal/g respectively. On a wet basis (wb), the snacks were found to have high moisture content (32.76 – 44.58%) and low ash content (0.25 – 0.90%) while on dry basis (db), they were reported with high fat content (1.97 – 20.06%), high available carbohydrate content (26.64 – 41.10%), low protein content (4.28 – 11.82%), low fiber content (0.92 – 3.87%) and high total sugar content (14.9 – 17.4%). The studied snacks were found to have high energy content (230.2 – 351.5 kcal/100g edible portions). The

results showed that there were significantly differences ($p < 0.05$) among all the values. Cooking methods and ingredients used for the snacks preparation were attributed to the difference in their nutrient composition. The snacks were mainly energy contributor with low nutrient content. By referring to present findings, consumer should make a better food choice based on their nutritional needs.

C06 Nutritive values of vegetarian patties containing grey oyster mushroom (*Pluerotus sajor-caju*)

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The objective of this study was to examine the sensory acceptance, proximate composition and calorie of vegetarian patties containing grey oyster mushroom (*Pleurotus sajor-caju).* Vegetarian patties were made from local soy curd *(tofu)* incorporated with different levels of fresh grey oyster mushroom (OM) at either 0, 25, 50, 75 or 100%. The formulations for vegetarian patty also include herbs, spices, egg and salt. Mean of proximate compositions were significantly different with different levels of grey oyster mushroom incorporated in patty formulations at 0%, 25%, 50%, 75% and 100%. At the level of OM increased up to 100% there were significance increase in the moisture content (from 37.09% to 53.94%), and ash (3.45% to 3.88%). However, there were significance decrement in protein (from 30.35% to 17.65%) and fat (from 25.88% to 16.09%) as the levels of OM increased in patty formulation. In sensory evaluation, there was significance different in term of color, elasticity, flavor and overall acceptance attributes of patty incorporated with OM. However, there was no significance different in term of aroma and juiciness attributes. Even though, there were differences in term of scores for sensory attributes, vegetable patties containing OM were still accepted by consumers. In summary, patty prepared with 50% is recommended to be promoted to vegetarian consumers.

C07 Phthalate content in used cooking oil, *Pisang Goreng* and *Keropok Lekor* in Serdang, Selangor

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Phthalates (phthalic acid esters) are organic lipophilic compounds that widely used as plasticizers for plastic polymers to improve their flexibility. Food can be an important source of human exposure to phthalates which can cause adverse health effect. This study was aims to investigate phthalate contamination in used cooking oil, *Pisang Goreng* and *Keropok Lekor* in Serdang, Selangor. Food and oil samples were collected from 15 *Pisang Goreng* food stalls and 15 *Keropok Lekor* food stalls respectively based on convenience sampling. The extraction of phthalate from the samples using acetonitrile was followed by solid phase extraction (SPE) clean-up step. Determination of 16 types phthalates – dimethyl phthalate (DMP), diethyl phthalate (DEP), diisobutyl phthalate (DIBP), di-butyl phthalate (DBP), bis-(2-methoxyethyl) phthalate (BMEP), diamyl phthalate (DAP), di(2-ethoxyethyl) phthalate (BEEP), benzylbutyl phthalate (BBP), di-cyclohexyl phthalate (DCHP), dihexyl phthalate (DHP), bis-(4-methyl-2-pentyl) phthalate (BMPP), bis-(2-n-butoxyethyl) phthalate (BBEP), di-(2-ethylhexyl) phthalate (DEHP), dioctyl phthalate (DOP), hexyl-2-ethylhexyl phthalate (HEHP) and dinonyl phthalate (DNP) – in the samples were carried out by gas

chromatography-flame ionization detector (GC-FID). At least one type of targeted phthalate was detected in each studied samples. DBP, DEP and DMP were the most frequently phthalate detected while BEEP and DEHP were least detected in the samples. There was migration of phthalates from oil into *Pisang Goreng* and *Keropok Lekor samples.* Both *Keropok Lekor* and *Pisang Goreng* samples showed a similar trend in term of percentage of phthalate migration. There is high possibility that *Pisang Goreng* and *Keropok Lekor* contaminated with phthalates were purchased and consumed by public. These finding raise the concern of phthalates contamination in street foods. Whether these contaminations were purposely introduced in the samples is yet to be determined. More study can be done for more types of Malaysia street foods and determined more possible types of phthalates contamination in the foods.

C08 Antioxidant capacity, total phenolic and total flavonoid content in young corn ear and cornsilk of different varieties.

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The objective of this study was to determine the antioxidant capacity, total phenolic and total flavonoid content in young corn ear (YCE) and cornsilk of different varieties. The YCE and cornsilk powder was extracted with ethanol by using Soxhlet apparatus and the percentage of recovery was calculated. The antioxidant activities were determined using 2, 2-diphenyl-2-picrylhydrazyl (DPPH) radical scavenging and ferric reducing power activity (FRAP). In addition, total flavonoid content and Folin-Ciocalteu test were also conducted. The highest percentage of recovery was exhibited by cornsilk extract with no significant difference among different variety, namely big fruit (43.08%), Thai supersweet (45.25%) and bi-color (47.79%). Cornsilk bi-color displayed the highest total phenolic content (143.58mg GAE/g extract) while cornsilk Thai supersweet exhibited the highest total flavonoid content (26.63 mg CAE/g extract). Meanwhile, YCE of bi-color variety demonstrated the highest total phenolic content (92.64 mg GAE/g extract) and flavonoid content (18.14 mg CAE/g extract) compared to other YCE varieties. At the highest concentration (800 µg/ml) tested, cornsilk of bi-color (93.82%) was the stronger electron or hydrogen donor due to the higher DPPH scavenging activity, followed by cornsilk Thai supersweet (92.87%), YCE bi-color (41.94%), YCE Thai supersweet (28.87%), cornsilk big fruit (28.87%) and YCE big fruit (21.38%). For ferric reducing power activity, cornsilk extract of bi-color showed the highest reducing power activity (65.46%) among all crude extracts. The result indicated that cornsilk and YCE extracts have shown strong antioxidant activities. With the highest percentage of recovery and strongest antioxidant capacity, cornsilk extract is highly recommended to be applied in pharmaceutical industries at the same time reducing agriculture waste. Holistic and multidisciplinary research on the YCE and its cornsilk is needed to provide the public with scientifically sound and accurate information.

C09 Relationship between dietary polyphenol intake and adiposity indexes among adults in cheras, kuala lumpur

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The objective of this cross-sectional study was to examine the relationship between dietary polyphenol intake and adiposity indexes among 227 adults aged between 40 to 59 years old, inform low cost housing area in Cheras, Kuala Lumpur. A validated food-frequency

questionnaire for polyphenol (FFQ) consists of 117 items under 9 food categories were completed by each subject. This is followed by anthropometric measurements of height, weight, body mass index (BMI), waist circumference, neck circumference and body fat percentage. Dietary polyphenol intake was then estimated by matching food consumption data from the FFQ with the database on polyphenol content in foods constructed locally based on PHENOL-EXPLORER. The mean dietary polyphenol intake was 1815 ± **672** mg/day and the major sources were caffeinated beverages, followed by vegetables and fruits. There was no significant difference in the total dietary polyphenol intake in men comparing with the intake in women (1813 ± 639mg/day; 1816 ± 694mg/day, p=0.898). No considerable difference was found between the dietary polyphenol intake with ethnicity (Malays: 1755 ± 593mg/day; Chinese: 1868 ± 842mg/day; Indians: 1882 ± 588mg/day, p=0.374). A higher intake of polyphenol according to quantile associated with a lower neck circumference (χ^2=9.05, p=0.029), waist circumference (χ^2 =8.45, p=0.038) and body fat percentage (χ^2=8.06, p=0.045). The association remained significant for neck circumference after adjustment of cofounder variables. In conclusion, polyphenol intake was associated with obesity and there is a need to further quantify the antiobesogenic dosage of polyphenol and also to elucidate its mechanism.

C10 The nutritional value of cornflakes and muesli ready-to-eat cereals in the Malaysian market

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Ready-to-eat breakfast is a popular way for busy Malaysians to have their quick breakfast. The aim of this study was to obtain an overview of the nutrient content of cornflakes and muesli ready-to-eat cereal products commercially available in the Malaysian market. The data will be used to update the 1997 Malaysian Food Composition Database. A total of 12 samples from six brands of cornflakes and muesli were sampled from local supermarkets in the Klang Valley and analysed using standard methods. The validity of test data was monitored with the application of internal quality controls in line with the requirements of ISO 17025. Analysis of the two types of ready-to-eat cereals revealed significantly higher levels of carbohydrate, minerals such as iron and sodium, vitamin B_1, B_3, folic acid, and sucrose in cornflakes rather than in muesli ($p<0.05$). However, muesli contains significantly more moisture, protein, total dietary fibre, magnesium, zinc, copper, total sugar, glucose, and fructose than cereals ($p<0.05$). Most of the fatty acids analysed were not detected or of low values in both cereal products. The nutrient analysis of cornflakes and muesli suggests that both ready-to-eat cereals are a good choice for consumers as an alternative food for breakfast.

C11 The nutritional composition of fruit jams in the Malaysian market

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Fruit jams are preserved fruits and sugars normally canned or sealed for long-term storage. Jam making involves the disruption of the fruit tissue followed by heating with added water and sugar to activate its pectin before being put into containers. However, processes that expose foods to high levels of heat may cause nutrient loss. Hence, the objective of this study was to evaluate the nutritional composition of four common fruit jams that are available in Malaysian market and to update the Malaysia Food Composition Database. A total of 24 samples from six brands of each fruit jams (grape, apricot, blueberry and strawberry) were sampled from local Hypermarket in Klang Valley. The jams samples were analysed for twenty seven nutrients using standard methods. This study showed that fruit jams are a good source of energy (of 266 – 274 Kcal/100g) and carbohydrate (65.99g/100g up to 67.65g/100g). The fruits jams were also contain water soluble vitamins such as vitamin C, B3 (grape and apricot), B9 (apricot and blueberry) and minerals (calcium, magnesium and sodium). However, the fruit jams contain very low level of fatty acid and no cholesterol detected. In conclusion, these findings provide valuable nutritional composition data of fruit jams that are available in Malaysia. In turn this will be able to help healthcare professionals in assisting the public to make healthier food choices.

C12 Antioxidative properties of selected commercially available edible mushroom in Kota Bharu, Kelantan, Malaysia.

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The objective of this study was to determine antioxidative properties of different species of mushrooms commercially available in selected supermarkets of Kota Bharu, Kelantan state of Malaysia. The polyphenol content and antioxidant activities of some ethanolic extracts of mushroom were evaluated. The antioxidant activities of all species of mushroom extracts were determined using ß-carotene bleaching method, 2,2-diphenyl-2-picrylhydrazyl (DPPH) radical scavenging and ferric reducing power activity (FRAP) techniques. The highest polyphenol content was exhibited by the shiitake (*Lentinus edodes)* (502.93 mg GAE/g) compared to oyster (*Pleurotus sajor-caju*) (376.20 mg GAE/g), button (*Agaricus bisporus*) (363.27 mg GAE/g), enoki (*Flammulina velutipes*) (307.33 mg GAE/g) and shimeji (*Hypsizygus tessellate*) (155.07 mg GAE/g). In the FRAP assay, the ferric reducing activity of oyster variety reached higher reducing power activity (72.39%) while shiitake (64.92%), shimeji (28.22%), button (23.33%) and enoki (19.09%) exhibited the lower reducing activity. In DPPH assay, the highest potential was found in shiitake followed by oyster, enoki, button and shimeji species. In the ß-carotene assay, after 120 minutes, button species exhibited the highest activity (34.08%) followed by shimeji (30.45%), oyster (29.16%), shiitake (17.1%) and enoki (5.22%). These results have indicated that various species of mushroom extracts have shown different ability of antioxidant activities and free radical scavenging capacities. Thus, it provides essential nutritional benefits which help consumers to choose their preferable edible mushroom for health betterment.

C13 Sugar content of some raw and processed food in Malaysian market

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In order to expand and update the data on the Malaysian Food Composition Database, the objective of this present work is to determine the total sugar and individual sugar content of raw and processed food that are commonly consumed by Malaysian population. A total of 46 samples (11 cereals and cereal products, 9 starchy roots, tubers and products, 4 legume and legume products, 11 seeds and products and 11 sugars and syrups) were sampled from local supermarkets in Klang Valley. The total sugar and individual sugar (sucrose, glucose, fructose, lactose and maltose) content was determined using High Performance Liquid Chromatography (HPLC) with Refractive Index (RI) Detector. The range of total sugar content in cereals and cereal products, starchy roots, tubers and products , legume and legume products, nut, seeds and products and sugars and syrups were 0.19-24.56 g/100g, 0.00-12.54 g/100g, 2.15-42.23 g/100g, 1.10-40.97 g/100g and 15.00-65.52 g/100g, respectively. Sugars and syrups contained the most total sugar while starchy roots, tubers and products contained the least. There were no lactose and maltose detected in sugars and syrups. Meanwhile for nut, seeds and products, legume and legume products, starchy roots, tubers and products there was no lactose detected. These data update the Malaysian Food Composition Database and can be used by health professionals and public to make healthier food choices.

C14 Total phenolic content and antioxidant activity of fresh and fried local fruits

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Fried foods are popularly consumed by people all over the world. Some of the famous Malaysian fried fruits are fried cempedak, jackfruit and breadfruit. These fruits are rich in antioxidant, but the antioxidant content after the fruits are fried is unknown as frying process may alter the antioxidant content. This study aimed to compare total phenolic content and antioxidant activity of fresh and fried local fruits. Freeze-dried samples were extracted using 80% methanol and Folin-Ciocalteu assay was used to determine the total phenolic content (TPC) of the samples while FRAP and Beta-carotene assays were used to evaluate their antioxidant activity. Fried jackfruit (76.836 $\pm$ 0.619 mg GAE/100g) had the highest TPC, followed by fresh jackfruit (71.098 $\pm$ 0.206 mg GAE/100g), fried cempedak (69.003 $\pm$ 0.681 mg GAE/100g), fresh cempedak (64.166 $\pm$ 1.210 mg GAE/100g) and fried breadfruit (60.524 $\pm$ 0.500 mg GAE/100g). The lowest TPC was in fresh breadfruit (54.042 $\pm$ 0.596 mg GAE/100g). Sample with the highest antioxidant activity as measured by FRAP assay was fresh cempedak (3.881 $\pm$ 0.301 mM Fe^{2+}/g), followed by fresh breadfruit (2.210 $\pm$ 0.085 mM Fe^{2+}/g), fresh jackfruit (1.819 $\pm$ 0.062 mM Fe^{2+}/g), fried jackfruit (1.030 $\pm$ 0.054 mM Fe^{2+}/g), fried breadfruit (0.821 $\pm$ 0.077 mM Fe^{2+}/g) and the least antioxidant activity was in fried cempedak (0.794 $\pm$ 0.106 mM Fe^{2+}/g). Using Beta-carotene assay, fried cempedak had the highest percentage of antioxidant activity (98.936 $\pm$ 0.182) followed by fresh jackfruit (98.182$\pm$ 0.657), fresh cempedak (95.826 $\pm$ 0.245), fried jackfruit (81.413 $\pm$ 3.575), fresh breadfruit (62.543 $\pm$ 2.159) and the lowest was observed in fried breadfruit

(-76.449 ± 8.139). There was no correlation found between TPC and antioxidant activity as measured using both FRAP and beta-carotene assays. In conclusion, frying of fruits resulted in increment of TPC and mixed changes in antioxidant activity of the final product.

C15 Determination of glycemic index and satiety scores of selected breakfast cereals among university students

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This study was conducted to determine the glycemic index and satiety scores of breakfast cereals in the market. The questionnaire was given to subjects aged 10 to 13 years old. They choose five breakfast cereal according to preference to be used as samples for this study. The five samples had been chosen were *Koko Krunch*, *Honey Stars*, *Cookie Crisp*, *Milo* and *Special K*. Glycemic index (GI) study was conducted by measuring the rise in blood glucose level. For this study, 10 subjects were involved. Subjects were selected based on Three-Factor Eating Questionnaires (TFEQ). They were served with breakfast cereal containing 50 g of available carbohydrate. Capillary blood samples from fingertips were analyzed before and after consumption of breakfast cereal samples at 15, 30, 45, 60, 90, 120, 150 and 180 minutes. The incremental area under the curve (iAUC) was used to calculate GI value for each sample. The highest iAUC value was for *Koko Krunch* (277.0 ± 125.1), meanwhile the lowest iAUC value was for *Special K* (241.7 ± 125.1). The GI values for all breakfast cereals were categorized as high (>85). As for the determination of satiety scores, subjects had to assess their perception of fullness or hunger by marking on the labelled magnitude satiety scale every 15 minutes for three hours. At 0 minute, no significant different ($p>0.05$) was detected between the reference and breakfast cereals. At 15 minutes, all samples reach their optimum value and decrease slightly against time. The highest satiety score was Special K (3031.1 ± 2624.6) followed by *Koko Krunch* (2881.9 ± 2534.3), *Cookie Crisp* (2525.3 ± 2733.6), *Honey Stars* (2152.8 ± 2392.5) and *Milo* (1994.8 ± 1970.4). Factors that can contribute to the satiety score was macronutrient contents. Cereals which have the highest energy and protein can increase the satiety score. Other than that, chewing has also contributed to the satiety scores. The highest chewing number was Special K (26.4 ± 12.0). The higher the chewing number for the sample, the higher score of satiety was observed. In conclusion, all breakfast cereals was categorized with high GI and not recommended to be consume because the glucose content in all sample were higher than expected.

C16 Comparison of nutritional value in variety of soybean beverages commercialized products

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This study aimed to compare the nutritional value of soybean beverage products commercially available in hypermarkets. A total of 26 types of soy beverages were used in this study (n=26). Two samples of each type of soy beverages were purchased from two hypermarkets in Kuala Lumpur, Tesco Ampang and Giant Maju Junction. Stratified sampling method was used in this study. Samples of soy beverages were divided into 6 groups namely soymilk (n=12), soy drink (n=3), flavored soymilk (n=5), fortified soymilk

(n=2) and less sweetened soymilk (n=2). The analyses conducted in this study were total soluble solids, total sugar available, total phenolic content, micronutrients (minerals and vitamin C) and isoflavones. Correlation test was used to analyze the relationship between total soluble solids, total sugar available and the nutritional labels on soy products. This study found that nutrition labels on soy beverages have no significant difference with analysis of total soluble solids. The lowest content of total sugar available was 5.81 ± 0.06 % (VS Multi Grain) and the highest was 14.22 ± 0.72 % (SR Soymilk). The lowest content of total soluble solids was 9.90 ± 0.10 °Brix (SR Soymilk) and the highest was 14.8 ± 0.15 °Brix (VS Multi Grain). Total phenolic content in M Soy drink was the lowest which is 340.44 ± 1.83 mg/ml and the highest was SF Cappuccino which is 1343.03 ± 4.90 mg/ml. Overall, the total phenolic content was higher in all types of soymilk compared to soy drink. The vitamin C content was the highest in SF Cappuccino (0.038 ± 0.005 mg/100ml) and the lowest was M Soy drink (0.006 ± 0.000 mg/100ml). In conclusion, soy beverage product that has good nutritional value and can be categorized as healthy is VS.

C17 Nutritional composition of pumpkin pau bun incorporated with *Oxalis barrelieri* powder

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Medicinal plants have received considerable attention in recent years and are promoted for primary health care as they have been found to contain phytonutrients which are thought to have curative, preventative or nutritive value. In Malaysia, *Oxalis barrelieri*, locally known as "belimbing tanah" is used as a traditional herbal remedy. The objectives of this study were to investigate the effect of *Oxalis barrelieri* (OB) in enhancing the nutritional composition of pau bun and to evaluate the feasibility of pumpkin puree as a filling replacer for coconut jam in pau bun. Two types of pau bun (coconut jam and pumpkin) were formulated with 0, 1, or 3% of OB powder to partially replace wheat flour. Addition of OB powder into both pau bun samples at the level of 3% increases ash (coconut jam: 0.95% to 1.17%; pumpkin: 1.14% to 1.58%), fiber (coconut jam: 1.26% to 1.88%; pumpkin: 1.85% to 2.87%) and fat content (coconut jam: 4.31% to 6.22%; pumpkin: 2.68% to 5.99%) significantly as compared with control. However, the carbohydrate content of coconut jam pau bun showed significantly decreasing trend with increasing levels of incorporation of OB powder (46.42% to 42.83%) while the carbohydrate content of pumpkin pau bun was not significantly affected. In addition, significant differences were observed in moisture, protein, fat and carbohydrate content between coconut jam and pumpkin pau bun at every comparable level of OB. Significantly higher moisture and protein while lower fat and carbohydrate values were observed in pumpkin pau bun as compared to coconut jam pau bun. The finding suggests that *Oxalis barrelieri* and pumpkin may be potentially used as a functional ingredient to enhance the nutritional values of pau bun.

C18 The contents of minerals, total polar compounds and free fatty acids in fresh cooking oil and recycled cooking oil

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Recycled cooking oil (RCO) is waste cooking oil (WCO) that is collected and refined after fresh cooking oil (FCO) has been used for frying and discarded. Some vendors may resell

RCO in the market by adulterating it with FCO. The objective of this study was to investigate the chemical parameters that can be used to distinguish between FCO and RCO. A total of 60 samples of WCO were collected from hawker stalls in Serdang, Selangor and randomly divided into groups of four. The WCO were customarily recycled into RCO through the processes of filtration, degumming, bleaching, deodorization, and adulteration. All RCO, FCO (sponsored by MPOB), and packet oil (5 brands) were analyzed for mineral content (sodium, potassium, calcium, iron, zinc), total polar compounds (TPC), and free fatty acids (FFA). Mineral content, TPC and FFA were reduced significantly in most of the oil samples after recycled. The potassium, iron and TPC contents in RCO were higher than that of FCO, with significant differences were found for iron and TPC content ($p<0.05$). Sodium, calcium, zinc and FFA content in RCO were similar with or even lower than that of FCO. Certain packet oils contained higher mineral, TPC and FFA content than that of FCO, suggesting that these brands may have been recycled. Moreover, the iron content in most of the packet oils exceeded the level set by Codex Standard for refined oils (0.15 mg/100g). Mineral was lost from food into cooking oil during frying due to the presence of moisture and exchange mechanism, whereas TPC and FFA were formed as hydrolysis and oxidation products. Recycling process could not reduce potassium, iron, and TPC to the level that similar with FCO. In conclusion, these findings suggested that potassium, iron and TPC content can be the chemical parameter to distinguish between RCO and FCO.

C19 The potential of *pleurotus sajor caju*: total phenolic content and antioxidant activities in herbal paste

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Pleurotus sajor caju (PSC) commonly known as grey oyster mushroom is widely cultivated and consumed in Malaysia. Currently, many research has tended focusing on dietary value of edible mushrooms as raw ingredients compared to finished products. However,, various products and by products based on mushrooms also have been researched and produced as food items to take advantage of their nutrients and functional properties. In the present study, herbal paste was formulated with the incorporation of the *PSC* either 0%, or 20%, or 40%, or 60%, or 80% or 100% and were evaluated for their antioxidant activities. The study was carried out using chemical assays to determine the capability of the extracts to scavenge 2,2-diphenyl-1-picrylhydrazyl (DPPH) radicals, to determine its reducing ability towards ferricyanide complex (FRAP assay) and to determine the concentration of total phenolic content (TPC). The highest extraction yield was achieved in 20% extraction (49.50%). Extraction yield reduced as ascending order of *PSC* substitution in the range of 44-50%. Our result showed that the ethanolic extract of products exhibited the potent scavenging activity there by posses increased antioxidant capacity which is compared to that of the standard antioxidant gallic acid and ascorbic acid. All investigated products containing *Pleurotus sajor caju* extracts posses reductive capabilities.

C20 Dietary fibre and total fluid intakes are inversely associated with Agachand's constipation scores in adolescents, adults and the elderly in a sample of Malaysians

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Dietary fibre (DF) and fluid intakes have been reported elsewhere to reduce the risk of constipation. The association of these dietary components on Agachand's Constipation Score (CS) was investigated with a sample size of 202 Malaysians adequate to detect a weak correlation of r=0.20 at alpha=0.05 and power of 0.80. The participants comprised 50 adolescents (aged 12.4±5.3 yrs), 50 adults (aged 46.3±11.3 yrs), 52 women of child-bearing age (aged 29.1±9.3 yrs) and 50 elderly persons (aged 70.0±7.4 yrs). Mean daily DF intakes analysed by DietPLUS V2 were low across all age groups with mean daily intakes of 12.4±5.3g in adolescents, 15.6±6.0g in adults, 10.0±5.1g in women of child-bearing age, and 14.4±7.4g in the elderly. The percentage of subjects with daily DF intakes below the "deficient" cut-off of 20g was alarmingly high; 80% in adolescents, 45% in adults, 85% in women of child-bearing age and 70% in the elderly. About one-fifth or 20% of subjects in all age groups had CS values ≥15 which indicated a problem of constipation. Mean daily total fluid intakes ranged from 2128- 2524 ml in the four categories of subjects. Overall, both daily DF intakes and total fluid consumption were negatively associated with CS values. However, this inverse association was only significant for DF vs CS scores in adolescents (r=-0.500, p=0.001), adults (r=-0.351, p=0.013), the elderly (r=-0.392, p=0.005) and all subjects combined (r=-0.363, p=0.001), while for total fluid intake vs CS scores only for all subjects combined (r=-0.244, p=0.001). The results of this study support the role of dietary fibre and total fluid intake in reducing the risk of constipation in Malaysians, as well reinforcing previous Malaysian data for low DF intakes and the need to relook at the "deficient" cut-off for DF in the local context.

C21 Alpha-amylase inhibitory, antioxidant and anti-inflammatory properties of three types of Malaysian edible seaweed

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Three types of edible seaweed namely *Eucheuma denticulatum, Sargassum polycystum* and *Caulerpa lentillifera* were analysed for potential health promoting properties including their inhibitory effect on starch digestive enzyme (α-amylase), antioxidant and anti-inflammatory activities. Dinitrosalicylic acid (DNS) assay was adapted in microplate to assess the alpha-

amylase activity. The antioxidant property of the seaweed extracts were determined by oxygen radical absorbance capacity (ORAC) analysis. The anti-inflammatory effects of the seaweed ethanol extracts were evaluated by nitric oxide (NO) inhibitory on the IFN-γ/ LPS stimulated murine macrophage cell line, RAW 264.7 using Griess assay. The tested seaweed extracts exert α-amylase inhibitory activities at varied level. Highest inhibition of alpha-amylase enzyme was by the *E. denticulatum* with 67% inhibition followed by *S. polycystum* and *C. lentillifera* with average inhibition of 36%. All the three seaweed showed significant antioxidant activities ranging from 1016 to 291 μmol Trolox equivalent (TE)/g. The extracts also exhibited potent inhibition on IFN-γ/LPS induced NO in a dose-dependent manner with IC_{50} from 3.49 to 31.38 μg/mL without cytotoxic effect to RAW 264.7 cells. The results suggest that seaweed is a promising source of effective functional metabolite. An in-depth evaluation of the edible varieties would contribute to a better understanding of their importance as functional food.

C22 Determination of proximate and sodium content of fast food fried chicken: comparison with nutritional guide provided

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Customers' acceptance of fast food has been in the upward trend which includes fried chicken from either franchised or local fast food restaurants. Some fast food outlets display the nutritional information of their fast food menu which is useful to help customers make informed choices. This study was undertaken to determine the proximate and sodium content of a well-known fast food restaurant to justify the data provided in its nutritional guide provided to customers. Three different parts of the fried chicken were analyzed including chicken breast, drumstick and chicken wing from two choices of recipe. Proximate analysis was carried out following the procedures of AOAC (1996). Data obtained was analyzed using SPSS 20.0 software. The results show that the fat and calorie content from all parts of chicken (breast, drumstick and wing) of the original recipe were higher than reported in the nutritional guide provided to customers, with difference between 3.73 to 10.95 g/100g of fat and 64.6 to 134 kcal/100g of calorie. The sodium contents in all parts of the fried chicken from the original recipe were lower than reported in the nutritional guide, with difference between 44.5 to 701 mg/100g. The other recipe choice (spicy) showed that the difference in fat content in all parts of chicken between the present study and reported in the nutritional guide were very negligible. The calorie content for drumstick showed lower value of 35.18 kcal/100g, chicken wing showed higher value of 55.0 kcal/100g than reported while negligible difference was observed in the breast chicken part. The average sodium contents in all parts of chicken were lower (252.22 mg/100g) in comparison with reported values (785.98 mg/100g). In conclusion, there were variations in the nutritional contents between the present data and reported values in the nutritional guide with marked difference in sodium content.

Group D: Clinical Nutrition / Intervention Trials

D01 The simultaneous effects of coffee caffeine and sleep deprivation on some metabolic biomarkers related to glucose homeostasis among Iranian adult men

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Sleep deprivation and coffee caffeine intake each one individually has been demonstrated to affect some symptoms of metabolic syndrome. However, the simultaneous effects of these two have not been investigated. While achieved the sleep pattern,this study aimed to determine the effects of sleep deprivation coupled with coffee caffeine intake on serum glucose, insulin level and insulin resistance in healthy Iranian adult men. The study was conducted in two phases of screening and experimental. In screening phase, forty-two moderate coffee consumers (≤3 cups/day), healthy male subjects (aged 20-40 y, BMI 18.5-24.9) were recruited using the Pittsburgh Sleep Quality Index (PSQI), interview, anthropometric measurements, and 24-h recalls. In experimental phase, after one night adaptation in research unit, subjects attend a crossover-randomized trial including three treatments with two-weeks washout periods. Each treatment consisted of three nights deprived sleep (4 hrs. in bed) + three 150 cc/cup from one of the beverages of boiling water (treatment 1), decaffeinated coffee (treatment 2, 99.99% caffeine-free) and caffeinated coffee (treatment 3, 65 mg caffeine/cup). Fasting and 2-h post-load blood glucose and insulin levels after an oral glucose tolerance test were measured at baseline and end of each triple-treatments. The mean PSQI calculated in screening phase was 4.68±2.24. Approximately 73% of participants were categorized into good sleepers (PSQI≤5). At the end of the experimental phase, comparing with decaffeinated, caffeinated coffee was shown greater levels of serum glucose ($p<0.001$), and insulin level($p=001$) during a following OGTT. This study indicated that in deprived sleep men, decaffeinated coffee resulted in significant improvement in glucose metabolic parameters as compared to caffeinated. Furthermore, the simultaneous administration of sleep deprivation and coffee caffeine led to an increased insulin resistance ($p=0.039$) mediated by higher insulin secretion.

D02 Effect of vegetable-oil based mayonnaise on cardiovascular risk assessed through long-term human studies

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Mayonnaise is a source of dietary cholesterol as well as vegetable oils rich in fatty acids. We evaluated vegetable-oil based Mayonnaise effect on cardiometabolic risk in normocholesterolemic and mildly hypercholesterolemic subjects. Thirty-four subjects

in a double-blinded crossover trial were fed diets containing 20g/day of soybean-based Kewpie mayonnaise (KP-mayo, linoleic acid-rich) or 20g/day palm oil-based mayonnaise (PO-mayo, palmitic acid-rich) for 4 weeks before switching diets for the next 4 weeks after a 2-week wash-out period. Controlled meals provided <150mg total dietary cholesterol. Plasma total cholesterol concentrations reduced significantly after both KP-mayo ($p<0.001$, es=1.031) and PO-mayo ($p=0.014$, es=0.445) compared to baseline with reduction effect larger after KP-mayo (diff= -0.26 ±0.36; $p=0.004$; es=0.716). Both treatments registered significant LDL-C reductions ($p<0.001$ for KP-mayo and $p=0.015$ for PO-mayo) compared to baseline with a larger difference associated with KP-mayo (es=0.960) compared to PO-mayo (es=0.438). Differences between diets were also significant ($p=0.035$). HDL-cholesterol concentrations significantly reduced from baseline after KP-mayo ($p<0.001$, es=1.061) but remained unaffected ($p>0.05$) after PO-mayo diet. ApoB-100 concentrations reductions from baseline were associated with KP-mayo ($p=0.030$) and PO-mayo ($p=0.009$, es=0.654). However, no significant difference in Apo A1 concentrations, triglyceride, glucose, free fatty acid, glucose, TBARS, and CRP concentrations were observed between test diets. Lipoprotein particle size differences were also associated with changes in LDL and HDL particle sizes ($p<0.05$).Cholesterol-rich mayonnaise appears safe in terms of cardiovascular risk. An important finding was inclusion of as little as 15g of linoleic acid was enough to modify atherosclerosis risk.

D03 Clinical impactof low glycemic index diet onimproving severe acne vulgaris in malaysian youths

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Acne vulgaris is one of the most common skin diseases seen by physicians.It has been postulated that the high glycemic index (GI) foodsplay an important role in the pathogenesis as well as recovery of acne vulgaris. Furthermore, the multicultural diversity gives rise to a variety of food preferences amongst Malaysians. Thus,this study was aimed to retrospectively identify the clinical impacts of low glycemic index diet in treatment of severe acne vulgaris among Malaysian youths residing in Malacca. The cases were retrieved from medical reports in SkiMed Clinic located in Malacca. A total of 20 patient records were reviewedbased on the inclusion and exclusion criteria. Out of the 20 patients, 10 received dietary counseling for low GI foods(study group) and the other 10had no dietary counseling (control group). Data analysed included demographic factors, anthropometric measurements, HbA1c, fasting sugarand global acne assessment score (GAAS) which were collected on the first and 4th visit atweek 12of the follow up. Patients' age group were 20-25 years old, predominantly Chinese (19 individuals) with mean BMI of 23.62 to 24.21. Majority of patients have Fitzpatrick skin type III (16 individuals) followed by type IV (4 individuals). In the first visit the GAAS was 43.4 and 41.4 whilst in the 4th visit it was 15.8 and 28.4 in the study and control groups respectively. The mean serum HbA1c level was 5.1 in both groups in the first visit; however, in the 4th visit it dropped to 4.9 in the study group and increased to 5.4 in control group. There was a drop of mean fasting sugar from 5.3mg/dL on the first visit to 4.96mg/dL at the 4th visit in the study group. In conclusion, adopting a low glycemic index diet in these patients revealed a greater improvement in the recovery of severe acne vulgaris than the regular Malaysian diet.

D04 Chronic effects of natural and interesterified margarine rich in either palmitic acid or stearic acid on insulin resistance in Malaysian adults

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Since trans fatty acids (TFA) have well-documented adverse effects on health, the food industry is gradually replacing hydrogenation with interesterification as a means to harden edible oils for food purposes. Two alternative methods are common, namely: a) use of natural fats rich in palmitic acid (16:0), and b) use of interesterified fats (IE-fats) rich in stearic acid (18:0). In our study we aimed to investigate whether IE-fats have any adverse effect on insulin resistance. In this parallel, double-blind clinical trial, we compared the effects of 16:0-rich vs 18:0- rich margarine with and without chemical modification on selected markers of insulin resistance. Each day for 8 weeks, 50g of three test margarine fats, namely 16:0-rich commercial natural palm margarine (POo) [Control], interesterified palm olein (IEPOo), and 18:0-rich chemically-modified soyabean and sunflower oil blend (modified FHSBO:HOSO:SO), were separately incorporated into two servings of snacks for complete consumption during breakfast and/or afternoon tea by three experimental groups, each comprising 28 or 29 adult volunteers aged 20-60 years and with BMI 21-30 kg/m^2. There were no significant differences ($p>0.05$) observed for the effects of the three test margarines on plasma glucose, insulin and c-peptide concentrations after the 8-weeks study intervention. These results were consistent with the findings that there were no significant differences ($p>0.05$) for the markers- insulin resistance (HOMA-IR) and insulin sensitivity (QUICKI), between the three groups of subjects. Therefore, we concluded that the predominant type of saturated fatty acid (16:0 or 18:0) in the test margarines or chemical modification by interesterification, do not affect the surrogate markers of insulin resistance measured.

D05 Cholesterol-lowering potential of tocotrienols-rich fraction (TRFs)

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This review summarizes data from studies of the effect of tocotrienols-rich fraction (TRF) supplement on human lipid profile. Vitamin E is the generic name of lipid soluble phenols, tocopherols and tocotrienols mixture. Tocotrienol differ from tocopherol in terms of the number of double bonds in the side chains and has more potent antioxidant activity than tocopherols. Palm oil is one of the most abundant natural sources of tocotrienol and the tocotrienol content of palm oil is higher than other vegetable oils. TRF are referred to tocotrienol and tocopherol concentrates. TRF has better cholesterols lowering effect than high tocopherols concentrates. A randomized, double-blind, placebo-controlled, parallel trial was conducted in 81 patients that undergoing chronic hemodialysis (Great Lake Dialysis Clinic, Detroit, USA) by Wayne State University, USA. The TRF (180 mg tocotrienols:40 mg tocopherols) supplemented group showed improvement in lipid profiles after 12 and 16 weeks of intervention compared to placebo (0.48 mg tcotrienols:0.88 mg tocopherols). Triacylglycerols (TAG) level in the TRF supplemented group were reduced by 33 mg/dL ($P = 0.032$) after 12 weeks and 36 mg/dL ($P = 0.072$) after 16 weeks of intervention but no

improvement was seen in placebo group. At the same time points, high-density lipoprotein cholesterol (HDL-C) was higher (P > 0.05) in the TRF group as compared with placebo. Study conducted to investigate the nephroprotective effect of TRF in type-2 diabetic rats also showed improved lipid profile, glycemic status and renal functions. Total cholesterol (TC), low-density cholesterol (LDL-C), very low-density cholesterol (VLDL-C) and triglycerides (TG) were higher in type-2 diabetic rats compared to healthy rats. Supplementation with TRF (23 mg% tocopherol:77 mg% tocotrienol) significantly (P > 0.001) reduced TC, LDL-C, VLDL-C and TG levels of type-2 diabetic subjects after 16 weeks. Hyperlipidemia is common in chronic hemodialysis patients and patients with diabetes mellitus. From these studies, TRF supplementation does benefits hyperlipidemia patients.

D06 Diabetes self-care activities among Iranian type 2 diabetic patients

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In the context of an alarming rise in the prevalence of type 2 diabetes in Iranian population, the diabetes self-care activities are important in the control of the disease. This cross-sectional study was conducted to assess the knowledge, attitude and self-reported diabetes care activities among 100 Iranian type 2 diabetics(61female, 39 male) aged 37 to 66 years,attending theout-patient diabetes clinic at Golestan hospital, Ahvaz, Iran. Validated questionnaires includingknowledge, attitude and practice (KAP)andSummary of Diabetes Self-Care Activities (SDSCA)were used to determine self-care activities. The mean duration of diabetes was 4± 1.4 years. Current body weight, height, waist circumference were measured.Nearly 83% of diabetics were overweight and 7% obese, while all were centrally obese. The results showed that knowledge regarding symptoms and complications of the diseaseawareness on detecting early complications of diabeteswere poor. Agreement in their attitude towardsdietary modification, self-monitoring of blood sugar and usefulness of weight control was found to be favorable in the majority; while compliance to dietary modification was reported to be high (74%), it appears to be contradicted for regular exercise (48%)**.**Totallyself-care activities were so poor.Patients need to be educated on how to prevent diabetes complications. Diabetic patients seem tobe dependent ondrugs for disease control, but without giving the proper attention to other healthy lifestyle modifications. Health care providers should promote healthy lifestyle modifications and self-care activities as parts of diabetes education.

D07 Promoting diabetes control with My Healthy Plate in Type 2 diabetes patients

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My Healthy Plate (MHP) is a visual meal planning tool developed to help Malaysian adhere to Malaysian Dietary Guidelines, with an emphasis of the use of the plate model concept to

represent a balanced diet with the proper portions of food groups that should be consumed at each meal. This quasi-experimental study aimed to determine the effects of MHP on diabetes control in people with type 2 diabetes (T2D). Subjects were 113 patients with poorly controlled T2D recruited based on quota sampling, stratified by sex and ethnicity, from the Diabetic Clinic of Hospital Serdang, Selangor. Subjects were allocated to control group (received seven-monthly newsletters by mail and routine care) (n = 58) or experiment group (received 4-lesson MHP nutrition education program provided bi-monthly for two months, followed by three-monthly newsletters by mail and routine care) (n = 55). Eighty four subjects (control = 48, experiment = 36) completed the baseline, 1- and 5-month post-intervention assessments. Using the 2 x 3 mixed design ANOVA, the experiment group had greater improvement in fat intake (interaction effect F = 3.402, p = 0.036), fruit and vegetable intake (F = 5.208, p = 0.008), dietary diversity score (F = 5.741, p = 0.004) and HbA1c (F = 3.640, p = 0.029) over time than the controls after adjustment for baseline measurement. The intervention effect remained significant (p < 0.05) on fruit and vegetable intake (+0.86 times/day), dietary diversity score (+1.51 points) and HbA1c (-1.15 percentage points) at five-month post-intervention. All experiment subjects were overwhelmingly satisfied with the MHP Program with majority reported that they understood the program well (91.1%), felt the program was helpful in achieving diet goals (91.9%) and managing diabetes (83.3%). In conclusion, MHP could be an alternative meal planning tool to promote diet quality and glycaemic control among individuals with T2D.

D08 Dietary Intake of People living with HIV on Antiretroviral Therapy (ART) in Malaysia

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People living with HIV (PLHIV) often experience multiple problems that keep them from eating adequately as a result of the infection itself as well as the side effects of the cocktail of medications that they are taking. This study aims to determine the adequacy of the dietary intake of PLHIV on antiretroviral therapy in an outpatient clinic in the Klang Valley. Using a purposive sampling method, 396 respondents (318 males, 78 females) with a mean age of 41.93 ± 8.15 years were recruited for the study. Interviews were conducted to collect information on socio economic status and 24-hour dietary recall method was used to collect data on nutrients intake. Analysis was performed by comparing the average intake recorded to the recommended nutrient intake (RNI) for Malaysians. The mean energy intake for males and females were 2005± 451kcal/day and 1785 ± 366kcal/day respectively. Only 16.4% males and 15.4% females achieved the recommended nutrient intake (RNI) values for energy. On the other hand, majority of both males (89.6%) and females (88.5%) managed to fulfill the recommended intake for protein. Inadequate intake of micronutrients among both males and females were highly prevalent. More females (80.8%) failed to achieve the recommended intake for iron (χ^2 = 51.642, p = 0.001) as compared to males (34.9%). Conversely, more males did not achieve the RNIs for zinc (64.2% vs. 38.5%) (χ^2 = 16.054, p = 0.001) and vitamin E (93.7% vs. 84.6%) (χ^2 = 5.805, p = 0.016) than females. In summary, the dietary intakes of PLHIV were severely inadequate. Nutrition education for PLHIV should be introduced to enable PLHIV to take responsibility and eat adequately to fulfill the increased nutritional demands due to HIV.

Group F: Experimental Nutrition

F01 Comparative cytotoxic effects of five *cucurbitaceous* plant extracts on colon cancer (HT29) cell line

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Colon cancer is one of the most common gastrointestinal cancers throughout the world and it now paved into the Asian nations due to changes in dietary patterns and preferences for Western diet. Cancer chemoprevention using natural foods is regarded as one of the most visible fields for cancer control. The objective of this study was to investigate the cytotoxic effects of aqueous and ethanolic fruits' extracts of *Cucurbitaceous* plants [*Cucurbita maxima* (pumpkin), *Momordica charantia* (bitter gourd), *Cucumis sativus* (cucumber), *Benincasa hispida* (winter melon) and *Luffa acutangula* (ridge gourd)] on colon cancer (HT29) and fibroblast (3T3) cell lines. The fruits were extracted by using distilled water and ethanol separately and shaking at 25 ºC at 150 rpm for 24 hours. The samples were extracted three times to maximize the extraction. The aqueous extracts were filtered and freeze-dried while the ethanolic extracts were evaporated to dryness at 50 ºC. Both cell lines were seeded in 96-well microtiter plates with density $1x10^5$ cells/ml in each well. Antiproliferative effect of the extracts was determined using MTT assay and the absorbance was taken at 540 nm. IC_{50} values were obtained from the plotted dose response curve (percentage of cell viability versus concentration). The doses of the treatment used ranging from 3.13 to 200 µg/ml were not being cytotoxic to normal cells (3T3). Ethanolic extracts of *Cucurbita maxima* (pumpkin) and *Momordica charantia* (bitter gourd) were effective at doses <25 µg/ml for 72-hour, with IC_{50} values of 18.45 µg/ml and 24.27 µg/ml, respectively. *Benincasa hispida* (winter melon) ethanolic extract inhibited 50% HT29 cell proliferation at a higher concentration (IC_{50} = 161.67 µg/ml). *Cucumis sativus* (cucumber) aqueous extract was the only treatment that could inhibit 50% HT29 cell proliferation with IC_{50} value of 121.82 µg/ml after incubated for 48-hour. In conclusion, *Cucurbitaceous* plants would have the potential to be used as an alternative treatment for colon cancer. However, further studies are needed to confirm the cytotoxic effects of *Cucurbitaceous* plants and understand the mechanisms involved in the cytotoxicity activity.

F02 Comparative Regulation of Lipolysis by EpigallocatechinGallate (EGCG) and Resveratrol in Human and Rat Adipose Tissue Explants

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This study aim to investigate and compare the effects of a known, potent lipolytic inducer (Isoproterenol) with individual dietary polyphenols on lipolysis in cultured rat and human adipose tissue (AT) explants. All AT explants were cultured in the presence or absence of increasing concentrations (0, 10, 50 or 100µM) of individual polyphenols (EGCG or Resveratrol) for 22 hours, with the final 3 hours being in the presence or absence of isoproterenol (IP). Glycerol concentration was measured as an indication of lipolysis. Results shown that treatment with IP increased lipolysis ($P<0.001$) in all experiments, although the rat AT explants tended to respond less to IP than human AT explants. The

effect of individual polyphenols varied. EGCG consistently inhibited lipolysis (P<0.001) in both rat and human AT explants, both in the presence and absence of IP, especially at the highest (100μM) concentration. The effects of Resveratrol were less consistent. An inhibitory effect (P<0.001) was observed in rat AT explants, both with and without IP (especially at 100μM concentration), whereas in the human AT explants, Resveratrol alone (without IP) increased lipolysis, particularly at 50 and 100μM, but inhibited lipolysis when IP was added, particularly 100μM Resveratrol (P<0.001 for Resveratrol x IP interaction). Only EGCG was found to have consistent effects in both AT explant systems. This suggests that individual polyphenols may have differing effects on lipolysis in AT from different species.

F03 Effect of red yeast rice (*Monascus Purpureus*) on Malondialdehyde, Total Antioxidant status, liver and kidney histology in diet-induced hypercholesterolemic rats

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The present study was designed to investigate malondialdehyde and total antioxidant status of red yeast (*Monascus Purpureus)* fermented rice in diet-induced hypercholesterolemic rats. The *Monascus Purpureus* fermented rice were divided into three doses treatments; low dose, medium dose and high dose treatment based on the recommended carbohydrate intake by human. There were six groups of rats (n=7) in this study including normal control group (NC), hypercholesterolemic control group (HC), hypercholesterolemic treated with 0.0072g/ kg of body weight lovastatin (HL), hypercholesterolemic treated with 0.46g/kg of body weight of red yeast rice (HR1), hypercholesterolemic treated with 1.37g/kg of body weight of red yeast rice (HR2), hypercholesterolemic treated with 2.28g/kg of body weight of red yeast rice (HR3). All the treatments were administered once every day to the rats by force feeding. The blood sample collection were conducted once only at day 28 (final) to measure plasma malondialdehyde (MDA) and total antioxidant status (TAS). The results showed that all the red yeast rice treatments had significant (p<0.05) increment in plasma MDA and TAS. For the MDA, through ANOVA, HR2 group has significant different (p<0.05) when compared to HC group. For the TAS, there were significant difference (p<0.05) between the HC group and HR2 and HR3 groups. Besides, there were significant difference (p<0.05) in lesion scoring between control group and treatment groups in liver histology. Meanwhile, in kidney histology, there was significant different (p<0.05) between HC group and treatment group treated with lovastatin which shown acute toxicity effects on kidney.

F04 Comparative cytotoxic effects of selected fruits and vegetables seeds' extracts on colon cancer (HT29) cell line

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Fruits and vegetables have been shown to be good sources of antioxidants and their antioxidant properties are not limited to their flesh. Seeds are generally considered to be agro-industrial wastes andbeing discarded. Evaluation of the medicinal properties in fruits and vegetables seeds is therefore of particular importance in view of possible valorization of seeds as a source of health beneficial components. This study assessed

the cytotoxic effects of aqueous and ethanolic seeds' extracts of*Carica papaya* (papaya), *Cucumismelo*L. var*cantalupensis* (cantaloupe), *Cucumismelo*L. var*inodorus* (honeydew), *Cucurbitapepo*(pumpkin), *Momordicacharantia*(bitter melon) and *Benincasahispida*(winter melon)on colon cancer (HT29) and mouse fibroblast (3T3) cell lines.Ground lyophilized seeds were submitted to extraction with deionized water and 95% ethanol. Aqueous extracts were freeze dried, whereas ethanolic extracts were evaporated to dryness at 45 °C. All cell lines were seeded in 96-well microtiter plates at density of $1x10^5$ cells/mL in each well. Concentrations used in treatment ranged from 3.13 to 200.00 µg/mL through serial dilution method.Cytotoxic effect of each extract was evaluated using 3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyltetrazolium bromide (MTT) assay at 24, 48, and 72 hours interval for HT29 and at 72 hours interval for 3T3 cell line. IC_{50} values were determined from the dose response curve of cell viability versus concentration of each extract. Among all the IC_{50} values on HT29 cell line, *Momordicacharantia*(bitter melon) seeds'ethanolic extract at 48 hours registered the lowest IC_{50} value (38.13 µg/mL), followed by *Carica papaya* (papaya) seeds' ethanolic extract at 48 hours (47.49 µg/mL) and *Cucumismelo*L. var*cantalupensis* (cantaloupe) seeds' ethanolic extract at 24 hours (73.84 µg/mL). For all the seeds' extracts, there was no IC_{50} value detected on 3T3 cell line after 72 hours.The results revealed that different seeds exhibited different cytotoxic effects on HT29 cell line and the effectsvary between extraction solvents. The results suggested that some seeds may serve as potential treatment of colon cancer without causing toxicity on normal cell. Further investigations of fruits and vegetables seeds would be worthwhile.

F05 Evaluation of the cytotoxicity and genotoxicity of stevioside on human colon-derived CCD-18co myofibroblast cell

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Stevia, a non caloric sweetener has been used throughout the world since decades ago. Stevioside, as an ent-kaurene type diterpenoid glycoside isolated from the leaves of *Stevia Rebaudiana Bertoni*, is reported to be 250-300 times sweeter than sucrose or the table sugar. In addition to its uses in food and beverages along with related compounds which include rebaudioside A, steviol and isosteviol, stevioside was reported to exhibit activities such as anti-hyperglycemic, anti-hypertensive, anti-diarrheal, anti-inflammatory and anticancer. In this study, we first examined the cytotoxicity of stevioside on human colon carcinoma cell, HCT 116(targeted cell) and human colon derived CCD-18co myofibroblast cells (non-targeted cell) using the MTT assay. Our result demonstrated that stevioside induced cell death on both HCT 116 and CCD-18co cell lines only at the highest concentration, 200µM by not causing more than 20 percent of cell death. We further examined the genotoxicity of stevioside on CCD-18co cell line. The result showed that it did not caused DNA damage at the same concentration following 24 hours incubation. In the conclusion, we summarized that stevioside, did not exhibit a potent cytotoxic effect on both HCT 116 and CCD-18co cell lines, but the result obtained secured its uses a non caloric sweetener.

F06 Anti-inflammatory effect of zinc carnosine on lipopolysaccharide -induced RAW 264.7 cells

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Zinc carnosine [N-(3-aminopropionyl)-l-histidinato zinc] is a metalloprotein in which zinc and L-carnosine were bound in a 1:1 molar ratio. It possesses a myriad of biological activity which includepotent anti-apoptotic and antioxidant activities. In this study, the anti-inflammatory effect of zinc carnosine was investigated using lipopolysaccharide (LPS)-stimulated RAW 264.7 murine macrophages as the in vitro model. Zinc carnosine is not cytotoxic towards RAW 264.7 cells at a concentration up to 100µM as assessed via MTT assay. We then further proceed to the assessment on the expression of nitrite on LPS-induced RAW 264.7 cells using the non-cytotoxic concentrations (0µM, 6.25 µM, 12.5 µM, 25 µM, 50 µM and 100µM) of zinc carnosine via Griess test. This metalloprotein was found to reduce the nitrite accumulation in RAW 264.7 cellsin a dose dependent manner, with significant reduction beginning at a concentration of 12.5µM. In agreement to this, immunoblotting assay also found that zinc carnosine reduced the expression of pro-inflammatory protein iNOSdan COX-2 in a concentration-dependent manner, with significant reduction from the concentration of 12.5 µM and 25 µM, respectively.In conclusion, zinc carnosine reduces the effects of LPS-induced inflammation, which warrants further investigation on the upstream mechanism of similar anti-inflammatary model.

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Heart Health, Is Wealth...

BIOGROW Oat BG22™

We've been hearing the statement ***"Health is Wealth"*** since our childhood. However, not all of us know the true meaning of it. Literally, it means that no matter how wealthy or rich you are, if we are not healthy or bed-ridden, there is nothing we can cherish in life. Staying healthy therefore becomes a necessity.

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1. Eating less fat and fewer calories.

2. Decrease sugar, salt and saturated fat intake from animal-based foods.

3. Increase dietary fiber intake from grains, fruits and vegetable sources.

Choose Oat Bran products which are packed with a high concentration of dietary fiber, especially soluble fiber beta-glucan for good health. Most studies have shown that taking 3g of oat beta-glucan per day can help reduce blood cholesterol levels. As early as in 1997, the US FDA has confirmed that taking 3g beta-glucan from oat bran, together with a diet low in saturated fat and cholesterol can help reduce the risk of heart disease.

How do we get the best oat bran product with substantiated health-enhancing benefits? The criteria listed below will guide you through your shopping process:

1. **Go for products which are fully made of oat bran powder** and no other non-oat or artificial ingredients.

2. **Check the oat beta-glucan content at the nutrition information on the packaging label**. According to the Malaysian food law, the maximum amount of oat beta-glucan allowed in food products is only **20 g per 100 g** or **20 %**. Make sure a daily serving of the product will deliver **at least 3 g** of oat beta-glucan for optimal cholesterol-lowering effect.

3. **Good solubility and gel-forming (viscosity) ability of the oat bran powder in water.** Oat beta-glucan with high molecular weight (> 2,000 kDa)[1] is shown to have greater gel-forming ability in water. Studies have shown that high viscosity effect produced by oat beta-glucans in the intestines is important to ensure optimal cholesterol-lowering effect[1,2].

4. **Cholesterol-lowering effect of the oat bran powder is substantiated with clinical trials and scientific studies.** Make sure you find out more information about the source of the oat bran powder and check if the oat bran powder was used as the research material in the clinical studies and published journals.

5. **Check the carbohydrate content at the nutrition information on the packaging label**. High amount of carbohydrates (simple sugars & starch) do not favour individuals with elevated blood sugar level and/or overweight problem.

Biogrow Oat BG22™ Oat Bran Powder is fully made of oat bran powder imported from Sweden with **20% high molecular weight oat beta-glucan (≥ 2,200 kDa)[1]** which ensures the formation of a thick, viscous gel in the digestive tract. Studies have shown that **high viscosity effect** produced by oat beta-glucans in the intestines is important to ensure optimal cholesterol-lowering effect[1,2]. Taking 2 scoops or 2 sachets (± 18 g) a day will provide **more than 3 g** of oat beta-glucan. Just mix 1 scoop or 1 sachet into 200 ml of cold or lukewarm water and drink at least twice daily before meals for best results. **Amount of oat beta-glucan recommended for cholesterol-lowering effect is 3 g per day.**

New in Malaysia! *Biogrow Oat BG22™ Crispy Cereal* – the First Functional Oat Bran Cereal

Now, 3 g oat beta-glucan for cholesterol-lowering effect is available in crispy cereal form!

Biogrow Oat BG22™ Crispy Cereal, delicious, crunchy heart-shaped crisps made from **Swedish oat bran** is fully made in **Germany** with sophisticated processing technology. **One single packet (30 g) provides 3 g oat beta-glucan** and is also high in dietary fiber (6.6 g per packet), high in protein, iron and magnesium. In terms of energy, one packet (30g) provides only **102 Calories** (or kcal), which constitutes about 4% – 5% of the daily energy requirement of an average adult (2000 – 2500 Calories/day).

It can be eaten directly from the packet as a convenient snack in between meals and tastes great also with cold, low fat milk or yogurt. High fiber consumption requires you to drink plenty of water as this will improve gel formation in the digestive tract for optimal cholesterol-lowering effect.

For more enquiries, please call 03-7956 2220 (Mon – Fri ; 9 am - 5 pm) or email to info@biogrow.com.my. Like our Facebook page at fb.biogrow.com.my.

References:

1. Wolever et al. Am J Clin Nutr. (2010).

2. Anttila H et al. Agricultural & Food Sciences (2004), Vol. 13: 80 – 87.

Over 6.2 Million Malaysians have High Blood Cholesterol*

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*National Health & Morbidity Survey (NHMS), 2011.
** FSQD, MOH. Guide to Nutrition Labelling & Claims (as at Dec 2010).

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2 sachets (= 18 g) = more than 3 g beta-glucan

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