



30th

Scientific Conference

Theme

**“Optimal Nutrition for
Future Generations”**

Programme & Abstracts

2 – 3 June 2015

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

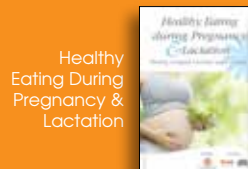
- Malaysian Journal of Nutrition
- Junior Chef Cookbook Vol 1 Let's Play Healthy Cooking
- Nutritionists' Choice Cookbook (Vol 1: Healthy Recipes for Your Little Ones, Vol 2: Resipi Untuk Seisi Keluarga)
- Resipi Sihat, Pilihan Bijak (Vol 1 & 2)
- Women@Heart *Wanita & Pemakanan* manual for professionals 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), Junior Chef Cookbook Vol 1 Let's Play Healthy Cooking



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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Members of the 15th Council & Organising Committee of 30th Scientific Conference

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Dr Tan Sue Yee

Dr Roseline Yap Wai Kuan

Dr Gan Wan Ying



President's Welcome Message

Welcome to the 30th Scientific Conference of the Nutrition Society Malaysia!

The Nutrition Society of Malaysia is proud to celebrate its 30th anniversary! As the Society turns 30 this year we are pleased to be able to continue organising this annual scientific event which I am sure all local nutritionists look forward to. One of NSM's goal is to promote nutritional 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 YBhg Datuk Dr Lokman Hakim bin Sulaiman, the Deputy Director-General of Health (Public Health), Ministry of Health Malaysia. We thank him for graciously consenting to declare open this Conference. The presence of YBhg Datuk is certainly meaningful to the NSM and the conference.

The 30th Annual Scientific Conference of the Nutrition Society of Malaysia (NSM) 2015 is dedicated to provide a platform to share research and intervention activities that contribute towards promoting optimal nutrition for future generations. With that, we decided to select the theme "Optimal Nutrition for Future Generations".

The scientific programme is packed with 28 oral presentations from a mixture of local and international speakers from the academia, government agencies, as well as the private sector. There are two 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 in promoting child 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 130 poster presentations covering a wide range of nutrition-based research.

Lastly, in commemoration of the 30th Anniversary of the Nutrition Society of Malaysia, we are proud to launch a new recipe book series called the Junior Chef Cookbook Vol 1: Let's Play Healthy Cooking. This cookbook is a unique educational cookbook, aiming at encouraging children to take part in food preparation as well as to spark their interest towards eating healthier foods. NSM strongly believes that this new cookbook will inspire and empower both parents and children with knowledge about food and nutrition, thereby inculcating them with healthy eating habits. This publication is yet another effort of the NSM to promote healthy eating among the community

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, and all sponsors. I thank my colleagues in the 15th Council of the NSM for their cooperation and support throughout the year.

Tee E Siong, PhD

President, Nutrition Society of Malaysia
president@nutriweb.org.my

Acknowledgements

The Nutrition Society of Malaysia gratefully acknowledges contributions from the following to the 30th Scientific Conference:

Major Sponsors

- Beneo Asia Pacific Pte Ltd
- PepsiCo (Malaysia) Sdn Bhd

Sponsors for NSM Publication Prizes

- Fonterra Brands (M) Sdn Bhd

Sponsor for Young Researcher's Symposium

- International Life Sciences Institute Southeast Asia Region

Sponsors for Conference Lunches

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New publication by Nutrition Society of Malaysia

Junior Chef Cookbook Series

Volume 1:

Let's Play HEALTHY COOKING

Healthful and delicious recipes for children to explore and prepare on their own.

Highlights from over 30 fun & easy-to-prepare recipes:

- ✓ Children can explore on their own or under adults' supervision where necessary.
- ✓ Feature easily available local ingredients.
- ✓ Categorized according to food groups.
- ✓ Content of major nutrients and interesting healthy eating tips.

Other features:

- ✓ Principles of healthy eating and cooking methods
- ✓ Practical step-by-step method and food preparation

only
RM16
• 108 pages
• English version



For more information or to purchase the cookbook, please contact:
Secretariat Office

Tel: 03-5632 3301 Fax: 03-5638 9909

Email: president@nutriweb.org.my versahealth@versa-group.com



SEA PHN

Southeast Asia Public Health Nutrition Network

A collaboration among



Food and Nutrition
Society of Indonesia



Nutrition Society of
Malaysia



Nutrition Foundation of
the Philippines, Inc



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



Vietnam Nutrition
Association

The **Southeast Asia Public Health Nutrition (SEA-PHN)** Network is a partnership of key stakeholders in the region, namely nutrition societies, government agencies to promoting public health nutrition among the population and alleviating nutrition problems in the region.

Please visit our website at <http://sea-phn.org>
for more information.

Sign up for Free to download nutrition related documents
at our resource area.

Official Opening

DAY 1 TUESDAY 2 JUNE, 2015

0730 hrs Registration

0900 hrs **OFFICIAL OPENING**
Ballroom A

0900 hrs **Welcome address by**
Dr Tee E Siong
President, Nutrition Society of Malaysia (NSM)

0910 hrs **Speech and official opening by**
Yang Berbahagia Datuk Dr Lokman Hakim bin Sulaiman
Deputy Director-General of Health (Public Health),
Ministry of Health Malaysia

- Presentation of NSM Undergraduate and Postgraduate Prizes
- Presentation of NSM Publication prizes
- Launching of NSM Junior Chef Cookbook Volume 1: Let's Play Healthy Cooking

0950 hrs **NSM Honorary Membership Presentation Ceremony**
NSM Honorary Membership presented to
Yang Berbahagia Datuk Dr Lokman Hakim bin Sulaiman,
Deputy Director-General of Health (Public Health),
Ministry of Health Malaysia

Tour of Trade Exhibition/Scientific Posters by invited guests

1000 hrs **Refreshment**

Poster Session: presenters in attendance for discussion

Scientific Programme

DAY 1

TUESDAY 2 JUNE, 2015

SYMPOSIUM 1 : Infant & Child Nutrition

Chairperson : Ms Rokiah Don
Director of Nutrition Division,
Ministry of Health

- 1030 hrs **First 1000 days of life: evidence from the USM Pregnancy Cohort Study**
Hamid Jan Jan Mohamed
Nutrition Programme, School of Health Sciences, Universiti Sains Malaysia, Kubang Kerian
- 1055 hrs **The association between maternal post partum anemia and low birth weight**
Yenni Suhadi and Gaga Irawan Nugraha
Department of Medical Nutrition, Faculty of Medicine, Universitas Padjadjaran, Bandung, Indonesia
- 1120 hrs **The effectiveness of breastfeeding intervention programme on self-efficacy and breastfeeding outcomes among Malay mothers in Seremban, Negeri Sembilan**
Zaleha Md Isa
Department of Community Health, Faculty of Medicine, Universiti Kebangsaan Malaysia Medical Centre, Kuala Lumpur
- 1145 hrs **Nutrient levels of foods served in kindergartens in Kota Kinabalu, Sabah**
Yasmin Ooi Beng Houi
Faculty of Food Science and Nutrition, Universiti Malaysia Sabah, Kota Kinabalu
- 1210 hrs **Picky eating: normal development or a disorder**
Rajini Sarvananthan
Park City Medical Centre, Kuala Lumpur
- 1235 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 (Ground Floor)
- Trade exhibitions shall be in the concourse area (Ground floor)
- Lunch shall be served at Ballroom B
- Morning and afternoon refreshments shall be served around the trade

SYMPOSIUM 2 : Infant & Child Nutrition
Chairperson : Prof Dr Norimah A Karim
Universiti Kebangsaan Malaysia

- 1400 hrs **The relationship between dietary patterns and overweight and obesity in children of Asian developing countries: a systematic review**
Yang Wai Yew
School of Health Sciences, Faculty of Health and Medicine, and Priority Research Centre in Physical Activity and Nutrition, University of Newcastle, Australia
- 1425 hrs **An exploratory study on risk factors for chronic non-communicable diseases among adolescents in Malaysia: overview of the Malaysian Health and Adolescents Longitudinal Research Team study (The MyHeART study)**
Hazreen Abdul Majid
Centre for Population Health and Department of Social and Preventive Medicine, Faculty of Medicine, University of Malaya, Kuala Lumpur
- 1450 hrs **Factors associated with disordered eating among adolescents: does body image play a role?**
Mohd Nasir Mohd Taib
Department of Nutrition & Dietetics, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia, Serdang
- 1515 hrs **S.M.A.R.T program based on latest Malaysian Dietary Guideline improves nutrition knowledge, attitude and practices for the primary school children: A preliminary study**
Ling Swee Nian
Nutrition Unit, Department of Public Health, District Tawau, Tawau
- 1535 hrs **Break / Trade Exhibition**

Note:

- All scientific sessions shall be in the Ballroom A (Level 1)
- Poster presentations shall be at Function Room 5 & 6 (Ground Floor)
- Trade exhibitions shall be in the concourse area (Ground floor)
- Lunch shall be served at Ballroom B
- Morning and afternoon refreshments shall be served around the trade

SYMPOSIUM 3 : Young Researcher's Symposium

Chairperson : Assoc Prof Dr Zaitun Yassin,
Universiti Putra Malaysia

- 1600 hrs **A beneficial influence of omega-3 fatty acid on DXA-derived indices of bone health in healthy postmenopausal Chinese women in Kelantan**
Wen Yin Siew and Foo LH
Nutrition Programme, School of Health Sciences, Universiti Sains Malaysia, Kubang Kerian
- 1615 hrs **Prevalence of disordered eating and its associated factors among primary school children in Selangor, Malaysia**
Chong Lin Siew, Chin YS, Gan WY and Mohd Nasir MT
Department of Nutrition and Dietetics, Faculty of Medicine & Health Sciences, Universiti Putra Malaysia, Serdang
- 1630 hrs **The H.E.B.A.T! Program: A randomized control trial intervention to combat childhood obesity in Negeri Sembilan, Malaysia**
Siti Sabariah Buhari, Ruzita A T and Poh BK
Nutritional Sciences Programme, School of Healthcare Sciences, Faculty of Health Sciences, Universiti Kebangsaan Malaysia, Kuala Lumpur
- 1645 hrs **Factors associated with body weight status among welfare home children in Selangor, Malaysia**
Nur Nabilla A Rahim, Chin YS and Norhasmah S
Department of Nutrition and Dietetics, Faculty of Medicine & Health Sciences, Universiti Putra Malaysia, Serdang
- 1700 hrs **Effects of an intensive physical activity education on knowledge, attitude and practices of physical activity in overweightobese adolescents: A pilot study of C.E.R.G.A.S intervention programme**
Lau Xiao Chuan, Poh BK and Ruzita AT
Nutritional Sciences Programme, School of Healthcare Sciences, Faculty of Health Sciences, Universiti Kebangsaan Malaysia, Kuala Lumpur
- 1715 hrs **Refreshment/Trade Exhibition**
- 1730 hrs **Meet the Experts**
Role of Nutritionists in Food and Nutrition Activities in Malaysia

2000 hrs

CONFERENCE DINNER

(An Appreciation to Members of Organising/Scientific Committee of the 9th Asia Pacific Conference on Clinical Nutrition 2015)

Venue: R-Studio 1, Level 2, West Wing,
Renaissance Hotel, Kuala Lumpur

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

Note:

- *All scientific sessions shall be in the Ballroom A (Level 1)*
- *Poster presentations shall be at Function Room 5 & 6 (Ground Floor)*
- *Trade exhibitions shall be in the concourse area (Ground floor)*
- *Lunch shall be served at Ballroom B*
- *Morning and afternoon refreshments shall be served around the trade*

DAY 2**WEDNESDAY 3 JUNE, 2015****SYMPOSIUM 4 : Industry Contributions in Promoting Child Nutrition**

Chaiperson : Dr Tee E Siong
President, Nutrition Society of Malaysia

- 0900 hrs **Understanding dietary fibre and its benefits**
Yasmin Ooi Beng Houi
Food Science and Nutrition Programme, Faculty of Food Science and Nutrition, Universiti Malaysia Sabah, Kota Kinabalu
- 0945 hrs **Slowly available carbohydrates and natural dietary fibres for a better metabolic set up – be prepared for the future!**
Anke Sentko
BENEO GmbH/BENEO Institute, Germany
- 1030 hrs **Refreshment / Trade exhibition**
- SYMPOSIUM 5a : Nutrition Potpourri**
Chaiperson : Dr Gan Wan Ying
Universiti Putra Malaysia
- 1100 hrs **Potential effect of vitamin C on inflammation in hypertensive and/or diabetic obese adults: a randomized, controlled trial**
Ellulu MS, Rahmat A, Ismail P, Khaza'ai H and Abed Y
Department of Nutrition and Dietetics, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia, Serdang
- 1120 hrs **Cross-Sectional study on weekday and weekend patterns of objectively measured sitting/lying, standing and stepping in obese children**
Nadzirah A, Razif S, Hasmiza H, Marhasiyah R and Wafa SW
School of Nutrition, Faculty of Health Sciences, Universiti Sultan Zainal Abidin (UniSZA), Kuala Terengganu
- 1140 hrs **Juara Sihat: A school-based childhood obesity nutrition promotion programme**
Devanthini DG, Mok WKH, Ruzita AT, Nik Shanita S, Sharif R, Mahadir A and Poh BK
Nutritional Sciences Programme, School of Healthcare Sciences, Faculty of Health Sciences, Universiti Kebangsaan Malaysia, Kuala Lumpur
- 1200 hrs **Decisional balance, self-efficacy and processes of change across the stages of change for exercise among overweight and obese Iban adults in Kuching, Sarawak**
Mazuin A, Cheah WL and Chang CT
Faculty of Medicine and Health Sciences, Universiti Malaysia Sarawak, Kota Samarahan

1220 hrs **A systematic review of associations between obesogenic environments and the increasing risk for obesity in children: An Asian story**
Razinah S and Reilly J
Nutritional Science Program, School of Healthcare Sciences, Faculty of Health Sciences, Universiti Kebangsaan Malaysia, Kuala Lumpur

1240 hrs **Lunch**

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

SYMPOSIUM 5b : Nutrition Potpourri

Chaiperson : Dr Roseline Yap Wai Kuan
Taylor's University

1400 hrs **Weight regain and its associated factors among working women in selected public institutions in Malaysia**
Zaleha Md.Isa, Hasanain Faisal Ghazi and and Sena Abdullah Abdul Jabbar Al-Qalah
Department of Community Health, Faculty of Medicine, Universiti Kebangsaan Malaysia Medical Centre, Kuala Lumpur

1420 hrs **The knowledge and practice of balanced diet intake among the rural and fringe Orang Asli women in Peninsular Malaysia**
Nik Nur Eliza M, Mohd Idris O, Noriah B, Eliana M, Rahimi H, Faris A, Hakimin MK, Izzah S and Norhashimah A
Institute for Health Management, Kuala Lumpur

1440 hrs **Development and validation of pregnancy physical activity likelihood assessment based on health belief model among pregnant women in Kuala Terengganu, Terengganu**
Noor Farahi K, Rohana AJ, Tengku Alina TI, Soo KL, Wan Nor Arifin WH and Noor Aman AH
Department of Community Medicine, School Of Medical Sciences, Universiti Sains Malaysia, Health Campus, Kubang Kerian

1500 hrs **Have we failed to impart good nutrition during pregnancy and lactation to our mothers based on evidence of a high prevalence of postpartum practice of food beliefs?**
Fatimah Arshad and Mabel Tiew
Department of Nutrition & Dietetics, International Medical University, Kuala Lumpur

1520 hrs **Compliance to WHO recommended complementary feeding practices in Sumedang, West Java, Indonesia**
Diana A, Gibson RS, Nugraha GI and Houghton LA
Department of Medical Nutrition, Faculty of Medicine, Universitas Padjadjaran, Bandung, Indonesia

1540 hrs **Advocating healthy eating through smartphone application – MyNutriDiari**
Zalma AR, Teh WS, Leong HY, Munirah MN and Thai PF
Nutrition Division, Ministry of Health Malaysia, Putrajaya

1600 hrs **Health benefits and potential risks related to the intake of omega-3 fatty acids and mercury from consumption of marine food in Malaysia**
Nurul Izzah A and Zurahanim FA
Institute for Medical Research, Kuala Lumpur

PRIZE GIVING CEREMONY AND CLOSING

Officiated by: Emeritus Prof Dr Mohd Ismail Noor
Vice-President, Nutrition Society of Malaysia

1630 hrs **Young Researcher’s Symposium and Best Undergraduate Poster Prize**

Refreshment / Conference Ends

Note:

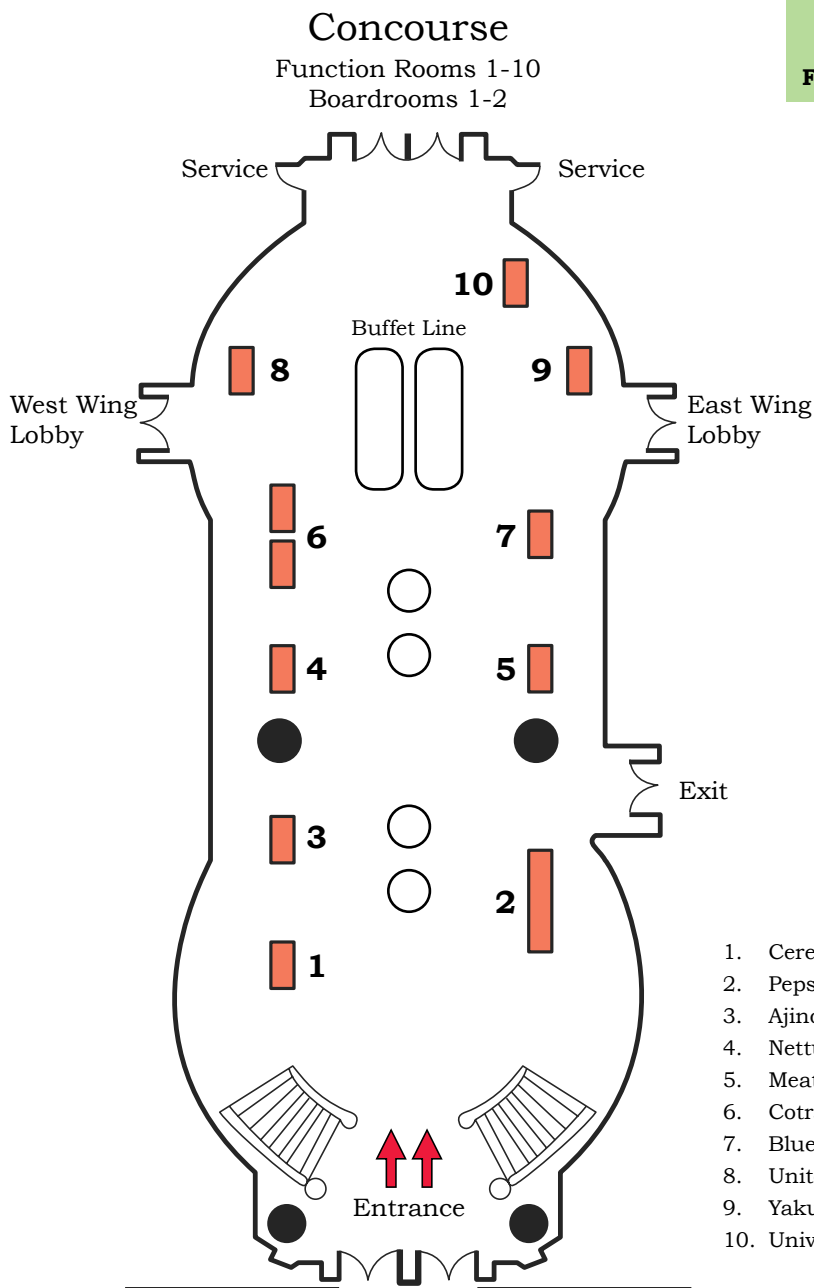
- *All scientific sessions shall be in the Ballroom A (Level 1)*
- *Poster presentations shall be at Function Room 5 & 6 (Ground Floor)*
- *Trade exhibitions shall be in the concourse area (Ground floor)*
- *Lunch shall be served at Ballroom B*
- *Morning and afternoon refreshments shall be served around the trade*

Exhibition & Poster Session Floorplan

Trade Exhibition

Poster Session

Scientific posters
are displayed in
Function Rooms 5 & 6



1. Cereal Partners (Malaysia) Sdn Bhd
2. Pepsico (Malaysia) Sdn Bhd
3. Ajinomoto (Malaysia) Berhad
4. Netturul Resources Sdn Bhd
5. Meat & Livestock Australia
6. Cotra Enterprises Sdn Bhd
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9. Yakult (Malaysia) Sdn Bhd
10. University of Malaya Press

NSM Award/Prizes 2015

NSM Postgraduate and Undergraduate Prizes 2015

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 2015, NSM is awarding four Postgraduate Prizes, two for PhD and two for MSc, with a total cash award of RM 3500. Six undergraduates receive Undergraduate Prizes with a total cash of RM 3,000. The total cash award for this year is RM 6,500.

The recipients for the PhD thesis prizes are:

1. Dr Mohd Redzwan Sabran

Aflatoxin Biomarkers in Human Biological Samples and their Potential Reduction By Probiotic Lactobacillus Casei Shirota Strain

Supervisor: Assoc Prof Dr Rosita Jamaluddin

Co-supervisors: Assoc Prof Dr Sokhini Abdul mutalib & Assoc Prof Zuraini Ahmad

University: Faculty of Medicine & Health Sciences, Universiti Putra Malaysia

2. Dr Mohd Razif Shahril

Development, Reliability and Validity of a Dietary Screening Index for Breast Cancer Risk Assessment (MyDIETRISK-BCa)

Supervisor: Dr. Sharifah Wajihah Wafa Syed Saadun Tarek Wafa

Co-supervisors: Prof. Madya Dr. Suhaina Sulaiman (UKM)

University: School of Nutrition and Dietetics, Faculty of Health Sciences, Universiti Sultan Zainal Abidin (UniSZA)

The recipients for the MSc thesis prizes are:

1. **Fara Wahida Rezali**

Personal, Behavioral and Socio-Environmental Factors Associated with Diet Quality Among In-School Adolescents in Kuala Lumpur

Supervisor: Dr Chin Yit Siew

Co-supervisors: Assoc Prof Dr Barakatun Nisak Mohd Yusof, Prof Dr Zalilah Mohd Shariff

University: Faculty of Medicine & Health Sciences, Universiti Putra Malaysia

2. **Fatimah Othman**

Oxidative Stress: Oxidative DNA Damage, Total Antioxidant Capacity and Selenium Status in Type 2 Diabetes Mellitus Patients and Healthy Subjects

Supervisor: Assoc Prof Dr Hamid Jan Jan Mohamed

Co-supervisors: Assoc Prof Dr K.N.S. Sirajudeen

University: School of Health Sciences, Universiti Sains Malaysia

The recipients for the undergraduate thesis prizes are:

1. **Wong Yaw Loong**

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

Supervisor: Prof Dr Poh Bee Koon

Co-Supervisor: Prof Dr Ruzita Abd Talib

University: Faculty of Health Sciences, Universiti Kebangsaan Malaysia

2. **Rabiatul Adawiah Mamat**

Assessment and acceptance of printed nutrition education materials among adults

Supervisor: Prof Dr Ruzita Abd Talib

University: Faculty of Health Sciences, Universiti Kebangsaan Malaysia

3. **Teng Chian Yi**

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

Supervisor: Dr Chin Yit Siew

University: Faculty of Medicine & Health Sciences, Universiti Putra Malaysia

4. **Ow Yang Yeok Lee**
Factors associated with infant growth status at three months old in Seremban, Negeri Sembilan
Supervisor: Prof Dr Zalilah Mohd Shariff
University: Faculty of Medicine & Health Sciences, Universiti Putra Malaysia
5. **Low Pei Kit**
Maternal Nutrient Intakes And Awareness On The Importance Of Folic Acid Consumption During Pregnancy In Kota Bharu, Kelantan
Supervisor: Dr. Soo Kah Leng
University: School of Health Sciences, Universiti Sains Malaysia
6. **Chong Evien**
Teachers' Knowledge, Perception and Acceptance of School Supplementary Feeding Programme or Rancangan Makanan Tambahan (RMT) in Kota Bharu, Kelantan
Supervisor: Dr Sharifah Zalhura Syed Abdullah
University: School of Health Sciences, Universiti Sains Malaysia

NSM Publication Prizes 2015

The NSM Publication Prizes are 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.

Three categories of NSM Publication Prizes were offered in 2015. These are for different fields of nutrition research, namely: Maternal Nutrition; Dairy Nutrition and Bone Health & Nutrition.

Members are encouraged to apply for these Publication Prizes which are offered in 2016. The announcements for these prizes are given in this Programme and Abstract book. Further updates on these prizes shall be announced in the NSM website in 2016: www.nutriweb.org.my

NSM Publication Prize: Maternal Nutrition

For the year 2015, 2 applications were received for this category. The Selection Committee decided that only applicant merits to receive the prize. The winner is as follows:

Name of recipient: **Assoc Prof Dr Hamid Jan Jan Mohamed** [L 0776]
School of Health Sciences, Universiti Sains Malaysia, Health Campus

Publication: Maternal Serum and Breast Milk Vitamin D levels: Findings from the Universiti Sains Malaysia Pregnancy Cohort Study
PLoS ONE 9(7): e100705.
doi:10.1371/journal.pone.0100705

NSM Publication Prize: Dairy Nutrition

For the year 2015, 1 application was received for this category. The Selection Committee decided to award the prize to this applicant, as follows:

Name of recipient: **Prof Dr Khor Geok Lin** [L 0006]
School of Health Sciences, International Medical University

Publication: Milk Drinking Patterns among Malaysian Urban Children of Different Household Income Status
J Nutr Health Sci 1(4): 405. *doi: 10.15744/2393-9060.1.401*

NSM Publication Prize: Bone Health and Nutrition

For the year 2015, 1 application was received for this category. The Selection Committee decided to award the prize to this applicant, as follows:

Name of recipient: **Chong Kar Hau** [L 2015]
Nutrition Programme, School of Healthcare Sciences, Faculty
of Health Sciences, Universiti Kebangsaan Malaysia

Publication: Radial Quantitative Ultrasound and Dual Energy X-Ray
Absorptiometry: Intermethod Agreement for Bone Status
Assessment in Children
BioMed Research International, vol. 2015, Article ID 232876,
7 pages, 2015. doi:10.1155/2015/232876

NSM Young Researcher's Symposium Prizes 2015

Winners of the Young Investigator'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

Prizes are provided by International Life Sciences Institute (ILSI) Southeast Asia Region Office, Singapore

NSM Poster Competition Prizes 2015

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

Prizes are by the Nutrition Society of Malaysia.

Announcements

NSM Publication Prizes 2016

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 2012-2016, 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 2016**.

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 2011 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 2015

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 2012-2016, 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 2016**.
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 2011 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 2015

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 2012-2016, 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 2011 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 2015

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 and F

Day 2: Poster themes B, C, and D

Poster themes:

A = Nutritional Status (various groups) and Community Interventions

B = Dietary Intake, Consumption Pattern and Diseases

C = Nutrients and Other Components in Foods / 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, E and F)

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

- A01. Assessment of physical activity and abdominal obesity among elderly in pondok institutions, kelantan : the preliminary findings
Anis Azira MR, Siti Suhaili I and Wan Abdul Manan WM
- A02. Assessment of hydration status and hydration practices among male club cyclists
Chen WC, Tan SY
- A03. Daily physical activity, mode of travel, and screen-based sedentary behavior and their associations with cognitive function in adolescents
Chong KH, Norimah AK, Ponnusamy S and Poh BK
- A04. Determination of obesity, physical activity and body fat percentage among women textile traders in Central Market Siti Khadijah and Bazaar Buluh Kubu, Kota Bharu, Kelantan
Cindy Lee XY & Rohana AJ
- A05. Eating behavior, nutritional status, and physical activity assessment among student from faculty of food science and technology in UPM
Dhivya M, Lim KZ and Satvin K

- A06. Relationship between socio-demographic status, disordered eating behaviour, physical activity level and body weight status with Health Related Quality of Life (HRQOL) among adolescents in Sepang, Selangor
Ebtisam M and Mohd Nasir MT
- A07. Validity and reliability of the food frequency questionnaire (FFQ) for primary school children in Malaysia
Huang NE, Tung SHE
- A08. Factors associated with total satisfaction with food-related life among elderly in Rumah Seri Kenangan, Selangor
Fatin Izzaty MS, & Noraida O
- A09. Does screen time affect the energy intake, sleep quality and physical activity levels?
Gan WX, Misra S and Al-Dubai SAR
- A10. Development of the Malaysian active healthy kid's report card on physical activity for children – a tool for management of obesity in Malaysian children
Zakaria NH, Sharif R, Poh BK, Wong JE, Saad HA
- A11. Body weight and eating behaviour of Nigerian postgraduate students in UniSZA, Malaysia
Abubakar HA, Shahril MR and Wafa SW
- A12. The Association Between Body Mass Index (BMI) And Diet Plan Among Women In Baghdad City, Iraq
Tiba Nezar Hasan, Shamsul Azhar Shah & Hasanain Faisal Ghazi.
- A13. A comparison of physical activity level assessed by who stepwise physical activity questionnaire, 3-day physical activity record and accelerometer
Hazizi Abu Saad and Ain Hanani Budiono
- A14. School canteen food purchasing practices and nutritional status of primary school students in Kelantan
Izzati Safwanah I and Soo KL
- A15. Factors associated with 6 months postpartum weight retention among mothers in Seremban, Negeri Sembilan
Jamilah S and Zalilah MS
- A16. Assessment of nutritional status among schoolchildren: Validity of self-reported weight and height
Kee CC, Lim KH, Sumarni MG, Teh CH, Chan YY, Tee EO, Ahmad Faudzi Y, Amal Nasir M
- A17. Factors related to food insecurity among adult homeless in Kuala Lumpur
Khairunnisa S and Norhasmah S

- A18. School food environment in relation to nutritional status of secondary school students
Kandiah M, and Khoo LL
- A19. Nutritional status and cholesterol level among staffs in the Health Campus, Universiti Sains Malaysia
Khor WX, Teoh CM, Tan SL and Sakinah H
- A20. Whole grain with healthy balanced diet intervention to manage childhood obesity in Malaysia (GReat-Child): study protocol for a quasi-experimental trial
Koo HC, Poh BK & Ruzita Abd Talib
- A21. Behavioral risk factors of body mass index (BMI-for-age) among Malaysian adolescents living in day-school hostels
Lai SC, Chin YS, Chan YM and Mohd Nasir MT
- A22. Assessment of total body water, fat-free mass, fat mass and calf circumference among male club cyclists
Lee JE, Tan SY
- A23. Validity and reliability of the Neighbourhood Environment Walkability Scale (NEWS) – Malay version
Lee YY, Narimah S and Wan Abdul Manan WM
- A24. Accuracy of three Android-based pedometer applications in laboratory and free-living settings
Leong JY and Wong JE
- A25. Assessment of nutritional and physical activity status among adults living in low-cost housing in Selangor, Malaysia
Lim SW, Razinah S and Roslee R
- A26. Nutritional Status and Health Status among lacto-ovo vegetarians in Kuala Lumpur, Malaysia
Chong GY & Norimah AK
- A27. Infant feeding practices and the nutritional status of infants 0-12 months of age attending the Health Clinic Desa Sikamat, Seremban
Tew ZW, Fatimah A
- A28. Factors associated with sleep disturbance among undergraduate students from a selected university in Selangor
Muhammad Akmal R, Barakatun Nisak MY and Fadhlina NZ
- A29. Physical activity and mixed land use in relation to nutritional status of adults in Kota Bharu
Nadiyatul Aida AT, Lee YY and Wan Abdul Manan WM

- A30. Nutritional status and physical activity: perceived benefits and barriers vs objective measures among Penang Island adults
Nadzirah B, Lee YY and Wan Abdul Manan WM
- A31. Sociodemographic factors, food security and mental health status among mothers in Mentakab, Pahang
Noratikah M and Norhasmah S
- A32. Physical activity status and its associated factors among Malaysian children with epilepsy
Nur Afiqah MY, Fong CY, Khoo TB, Mohamed AR and Poh BK
- A33. Prevalence of undernutrition and its associated factors among children in Pendang district, Kedah
Nur Hafizah AS and Geeta A
- A34. Nutritional status of secondhand smoke exposed mothers and children
Nur Nadia M, Loy SL and Hamid Jan JM
- A35. Association of dietary intake, physical activity level and eating behavior with body weight status among adolescents in Putrajaya
NurSyairah CN and Zuriati I
- A36. Development and testing of pictorial nutrition and activity knowledge scale among people with intellectual disabilities
Nur Syamimi A, Chen ST
- A37. Factors associated with cognitive ability among adolescents in secondary schools in district of Gombak
Nuraini R and Rosita J
- A38. Body weight status, eating behavior, physical activity level and depressive symptoms among adolescents in Putrajaya
Nurul Wahidah AR and Zuriati I
- A39. Body weight histories, perceptions of body weight status, body image and dieting behaviours among adolescents
Oi CC and Wong JE
- A40. Malnutrition among indigenous pre-school children in gua musang, Kelantan
Oui PG, Razalee S, Ahmad Faris A and Azura S
- A41. The association between school compliance towards “Whole-School Environmental Mapping Framework” and weight status of school children: a preliminary study
Rasyidah G, Aryati A and Wafa SW
- A42. Relationship between knowledge and consumption of soy products with nutritional status among children aged 9 to 11 years in Sekolah Kebangsaan Seri Setia Kuala Lumpur
Ruhaya S, Hasnah H, Ruzita AT

- A43. Nutritional status and physical activity level among Royal Malaysia Police (RMP) personnel and trainees at Police Training Centre, Air Hitam, Negeri Sembilan
Ernie Syafika Z, Sarina S.
- A44. Body image dissatisfaction, high nutrition knowledge and macronutrient intake as predictors of body weight status among Chinese vegetarians in Selangor
Seik MY and Gan WY
- A45. Dual forms of malnutrition among same household in Empat Lawang, South Sumatra, Indonesia
Siska Aprilia, Sarina S.
- A46. Relationships between familial factors with body weight status among Malay preschoolers in Tabika Perpaduan in Tanah Merah, Kelantan
Siti Humaira S and Gan WY
- A47. Sociodemographic factors, food security, and health related quality of life among adolescents in Mentakab, Pahang
Susanti A and Norhasmah S
- A48. Association of sleep pattern with dietary intake and physical activity among Malay adolescents aged 10-14 years in Kuala Lumpur
Tan CC, Ang YN and Poh BK
- A49. Nutritional status and health profile among single mothers in Kota Bharu, Kelantan
Teoh CM, Khor WX, Tan SL, Sakinah H
- A50. The T&Z Calorie Counter- A convenient, excel-driven tool to measure basal metabolic rate, physical activity level, total energy expenditure and moderate-to-vigorous physical activity in a single 24-hr recall
Ng TKW
- A51. Knowledge, attitude and practices (KAP) on nutrition and oral health: an association with early childhood caries (ECC) and nutritional status of children attending private TASKA in Kota Bharu, Kelantan
Wong CY and Ruhaya H
- A52. Is body shape index a better predictor of blood pressure than body mass index and waist circumference in Malay children and adolescents?
Ang YN, Wee BS, Wu SK, Kagawa M, Mahadir and Poh BK
- A53. Factors associated with gestational weight gain among pregnant mothers attending health clinics in Batu Pahat, Johor
Yu MS and Chin YS

E: Food Science and Technology

- E01. Morphological characteristics and textural properties of chiffon cake incorporated with different particle size of young corn powder (YCP)
Pek YS and Wan Rosli WI
- E02. Modification of phosphorus-to-protein ratio in fresh chicken meat and chicken meat products through different cookings
Chong WT and Chan YM
- E03. The effect of avocado as fat replacer on the physical and sensory attributes of chocolate cupcakes
Nur Hadaina H. and Marina AM.
- E04. Determination of proximate and mineral contents of chocolate cupcakes prepared with Persea americana fruit as fat replacer
Nur Izzati MS and Marina AM
- E05. Encapsulation of Lactobacillus acidophilus in tropical fruit juices
Ow JT, Chew LY and Junus S
- E06. The effect of different cooking techniques on physical and sensory properties of oyster mushroom and its application in beef patty
Rifhan Aqilah M.F. and Wan Rosli W.I.
- E07. Effect of cooking on total polyphenol content and antioxidant capacities of mix spices cooking pastes in Malaysia
Yap YT & Hanis Mastura Y
- E08. Effects of drying method on phenolic content and antioxidant activity of papaya fruit
Zuhair Radhi A, Aminah A, Sahilah AM, Saif Alyaqoubi and Khalid Hamid M

F: Experimental Nutrition

- F01. Maintenance of vitamin D status in Zucker diabetic fatty rats by dietary resistant starch is dependent on kidney health and serum adiponectin levels
Koh GY, Leow SE, Reed L, Wisecup E, and Rowling MJ
- F02. Comparative anti-proliferative effect of crude extract of bitter melon's (*Momordica charantia*) seeds and pulp on human colon cancer (HT-29) cell line
Ng SP and Norhaizan ME
- F03. Pasting profiles of composite flour blends with cornlettes
Nurul Ali'im ZA and Wan Rosli WI
- F04. Cytotoxic effect of extracts of *Centella asiatica* (pegaga) and *Cosmos caudatus* (ulam raja) on colon cancer (HT29) cell line
Tan YF and Norhaizan ME
- F05. Morphological characterizations and physicochemical property of bun formulated with different particle size of cornlettes (*Zea mays* L.)
Wan Nur Suriati H, Wan Rosli WI
- F06. In vitro and cellular bioactivity of *Eucommia denticulatum* (N.L. Burman) F.S. Collins and Hervey for putative type 2 diabetes management
Vimala B, June Chelyn L, Mohd Fairunizal MN, Syahida A, Brownlee IA and Amin I

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

Group B: Dietary Intake, Consumption Pattern and Diseases

- B01. Comparison of dietary intake among pre-menopausal and post-menopausal newly diagnosed breast cancer patients at Hospital Universiti Sains Malaysia (HUSM)
Ainaa AAR, Zunura'in Z, Suzana S, Bhavaraju VMK and Gan SH Hamid Jan JM
- B02. Factors associated with disordered eating behaviours among male adolescents in Sepang, Selangor
Choong CFL and Mohd Nasir MT
- B03. Do fruit and vegetable consumption differ in their associated factors?
Chai WS and Gan WY
- B04. Development of a food diary mobile application and its acceptability among young adults
Chen YS, Nor Effendy Othman, Poh BK and Wong JE
- B05. Consumption of canteen foods and beverages and the relationship with nutritional status among secondary school students
Kandiah, M, and Chong SM
- B06. Determinants of fruit and vegetable consumption according to Theory of Planned Behavior among adults in Klang, Selangor
Dinie Syahira R and Norhasmah S
- B07. Association between added sugar intake with weight status among Malay primary schoolchildren in Kuala Lumpur
Ginny JS and Norimah AK
- B08. Perception and knowledge on the use of Chinese herbs among the Chinese population in Kota Bharu, Kelantan
Ho YH & Wan Faizah WY
- B09. Knowledge, attitude and practice towards traditional health belief and practices relating to food habits among indians in kelantan: a cross sectional study
Kamaraju Subramanian and Wan Faizah Wan Yusoff
- B10. Body weight status of university students and its relationship with energy density and nutrient adequacy of food consumed from canteens in the campus
Kandiah M, and Kok LJ

- B11. Influences of socio-demographic characteristics on fruits and vegetables intake of Malaysian primary school children
Lee ST, Wong JE, Nik Shanita S, Ruzita AT, Norimah AK and Poh BK
- B12. Comparison of parental influences and dietary practices between normal weight and overweight or obese primary school children in Hulu Langat district, Selangor
Leiu KH and Chin YS
- B13. Factors associated with nutritional supplement use among exercisers in a selected gym in Penang Island
Loh SY and Hazizi AS
- B14. Eating habits among on and off campus students in Universiti Kebangsaan Malaysia (UKM)
Razalee S, Rabiatul Adawiyah R and Nor Atiqah R
- B15. Walking activity and food intake among female students in Universiti Kebangsaan Malaysia (UKM)
Nor Azlina J, Norlida MD and Arnida Hani T
- B16. Intakes of dietary energy density among obese and non-obese adolescents in Kamunting and Taiping, Perak
Nor Shafnaz A and Geeta A
- B17. Pubertal development and disordered eating behaviors among Malaysian adolescents aged 12-19 years old
Norhayati M, Chin YS, Mohd Nasir MT, Zalilah MS and Chan YM
- B18. Vitamin D insufficiency status, its risk factors and relationship with gestational diabetes mellitus among Malaysian pregnant women in an urban district
Noriklil Bukhary IB, Zaleha MI, Khadijah S, Khor GL, Zaleha AM, Haslinda H and Noor Sharifatul Hana Y
- B19. Food album aid development and validation for estimating portion sizes of common Malaysian foods and dishes for adult
Nur Adilah BH and Siti Nur 'Asyura A
- B20. Patients' satisfaction with hospital food provision at government hospitals in Malacca.
Nur Zakiah K and Vijayakumaran R
- B21. Factors associated with disordered eating among female adolescents in Sepang, Selangor
Nurul Atiyyah H and Mohd Nasir MT
- B22. Assessment of dietary and lifestyle practices among Malay survivors of breast cancer in Kelantan
Rebecca W, Murali Krishna BW and Foo LH

- B23. Correlates of dietary and lifestyle practices among university students in Kelantan
Roseleeny S and Foo LH
- B24. Comparison of patients' satisfaction between 'bulk trolley' and 'centralised plating' food service systems in two government hospitals in Selangor
Ramkumar S and Vijayakumaran R
- B25. Sweet Taste Preferences and Body Mass Index (BMI) Among Aboriginal Children and Urban Children in Selangor, Malaysia
Syazwani S and Heng KS
- B26. Correlation between dietary intake with anthropometric status, blood pressure and lipid profile among Malay adolescents in Kuala Lumpur
Tan LY, Ang YN, Wee BS and Poh BK
- B27. Effectiveness of multiple exposure on acceptance of a test vegetable among children aged 6 year at Kuala Lumpur
Ummu AH and Rajasegar A
- B28. Sugar-sweetened beverages (SSBs) intake in obese and non-obese adolescents in Kamunting and Taiping, Perak
Saidatul WM and Geeta A
- B29. Influence of home environment and personal factors on disordered eating among early adolescents in Hulu Langat district, Selangor
Woon FC, Chin YS, and Mohd Nasir MT

Group C: Nutrients and Other Components in Food / Products

- C01. Proximate and amino acids composition of Terengganu traditional fish-based products
Alif I & Amin I
- C02. Determining the phosphorus to protein ratio of fast foods that commonly consumed by university students
Chang ZY and Chan YM
- C03. Effect of different cooking procedures on total polyphenol content and antioxidant capacities of organic and inorganic beans
Dang TN and Hanis Mastura Yahya
- C04. Screening of aflatoxin M₁ occurrence in selected milk and dairy products in Terengganu, Malaysia.
Farah Nadira A, Rosita J, Norhaizan ME.*
- C05. Comparison of total sugar content between fresh fruit juice and commercial fruit juice
Fong CY, Hasnah H

- C06. Determination of Antioxidant Activity and Content of selected varieties of *Lactuca sativa* L.
Gan YZ and Azrina A
- C07. Heavy metals profiles in commonly consumed freshwater fish and shellfish in central region of Peninsular Malaysia
Goh WT and Shariza AR
- C08. Proximate and fatty acid composition on selected fruits and vegetables-based fried snacks
Hia PM & Amin I
- C09. Proximate and sugar compositions of selected Malaysian raw honeys
Kau ZT, Azlan A, Chin NL, Fairulnizal MM and Norhayati MK
- C10. Comparison of total phenolic contents (TPC) and antioxidant activities among fresh fruit juices, commercial 100% fruit juices and fruit drinks
Khaw HW and Hasnah H
- C11. Bioaccessibility of chlorogenic acid (5-caffeoylquinic acid) in selected instant white coffee
Lim CW and Loh SP
- C12. Antioxidant capacity, total phenolic content and total flavonoid content of *Pluchea indica* and its application in biscuits
Lim MF and Asmah R
- C13. Determination of total phenolic and gamma-aminobutyric acid (GABA) content, and phenolic composition in brown rice and germinated brown rice snacks
Mark PY and Norhaizan ME
- C14. Proximate and sugar compositions of selected glutinous rice-based foods
Mohamad Akili ZU & Amin I
- C15. Proximate and sugar composition of selected tuber-based traditional kuih
Mok MW & Amin I
- C16. Amino Acid composition in selected cereal and cereal products in the Malaysian Market
Norhayati MK, Athirah Z and MohdFairulnizal MN
- C17. Comparing the antioxidant activity, total phenolic content and flavonoid content between various types of *Strobilanthes Crispus* tea and commercial green tea
Fatimah NL and Asmah R
- C18. Determination of physical characteristics and macronutrients of *Persea americana* fruit
Nurul Amira Z. and Marina AM.

- C19. Quantification of sugar profiles in popular instant premix powder drinks marketed in Malaysia
Nurul Nadiyah A, Aswir AR and Foo LH
- C20. Protein content and amino acids profile of coconut's milk (Pati santan) in Malaysia
Saif Alyaqoubi, Aminah Abdullah, Muhamad Samudi, Norrakiah Abdullah, Zuhair Radhi Addai and Maryam Al-ghazali
- C21. Comparing physicochemical properties, antioxidant capacity and total phenolic content between homemade and commercial dates (Phoenix Dactylifera L.) vinegar
Saw JW and Hafzan Y
- C22. Sodium and Potassium Contents in Selected Salts and Sauces
Tan WL, Azlan A, Noh MFM
- C23. Variability of selenium and mercury molar ratios in seafood of West Peninsular Malaysia
Zurahaman FA, Nurul Izzah A, William M

D: Clinical Nutrition / Intervention Trials

- D01. The simultaneous effects of sleep deprivation and coffee caffeine consumption on lipids profile of Iranian adult men
Rasaei B, Norimah AK, Ruzita AT, Ismail MN, Karandish M
- D02. Prevalence of constipation among children 1 to 3 years attending child care centers in Selangor and its associated factors
Cheong JC, van Tilburg, MA, Chin YS
- D03. Association of body fat with dental caries among selected adults in Klang Valley
Jacqueline TYX, Satvin K.
- D04. Determination of plasma concentration of vitamin C and total antioxidant capacity in patients undergoing chronic hemodialysis and its associated factors
Lai ST, Sahathevan S, Karupiah T and Mat Daud ZA.
- D05. Meal-replacements and weight loss in diabetes: rationale and design of a randomized controlled trial
Lee CL, Chee WSS, Vethakkan SR, Ratnasingam J and Chan SP
- D06. C.E.R.G.A.S school-based intervention pilot study: Effectiveness on nutrition knowledge, attitudes and practices among overweight and obese adolescents
Lee XE, Lau XC, Ruzita AT, Wong JE, Koh D, Hazizi AS, Razalee S, Ng LO, Ahmad TJ, Poh BK

- D07. Insights into the knowledge, attitude and practices of head and neck cancer survivors at otorhinolaryngology outpatient clinic of UKM Medical Center
Suhaina S, Nadzirah HZ, Razif MMY, Kong MH, Mawaddah A, Nor Shahrina MZ, Yap WJ, Salleh A and Mohd Razif S
- D08. Personal UV behaviour and estimated cutaneous synthesis of vitamin D among adults in Kuala Lumpur during Southwest and Northeast Monsoons
Nor Aini J, Noor Hafizah Y, Yew MH and Poh BK
- D09. Development of a mobile game application (NutriNinja™) to promote physical activity and healthy eating knowledge among adolescents
Nor Izzati A, Lau XC and Poh BK
- D10. Correlations of body weight status among severe mental illness patients
Nur Sabrina Z, Gan WY, Chan YM, Ang JK and Ismail, SIF
- D11. The association of adiponectin and leptin with objectively measured physical activity among adults: a brief review
Nurnazahiah Ali, Mohd Razif Shahril and Lua Pei Lin
- D12. Effectiveness of nutritional education to improve nutritional status among institutionalized elderly
Ruhaya H and Enny Esdayantey AM
- D13. Evaluation of diabetes-related distress in type 2 diabetes patients in Iran
Shooka M, Norimah AK, Ruzita AT and Amani R
- D14. Polygonum minus extract improved mood and quality of life in middle aged women: a randomized, double-blind, placebo-controlled study
Arina SNI, Hanis Mastura Y, Suzana S, Ainor FA and Normah CD
- D15. An intervention towards weight reduction in an open community
Tan SS, Khor GL, Snigdha M, Maznorila M, Chong HZ and Normah H
- D16. Satiety scores and glycemic index of selected beverages with beta-glucan
Tey HC, Zalifah MK and Razalee S
- D17. Anthropometric characteristics among newly diagnosed breast cancer and healthy women: A case-control study
Zunura'in Z, Ainaa AAR, Bhavaraju VMK, Gan SH and Hamid Jan JM
- D18. Food craving, night eating syndrome and GDM status among Pregnant Women Attending Health Clinics in Batu Pahat, Johor
Nurul Hidayah H, Chin YS
- D19. Development of healthy education intervention – “Eat Right, Be Positive About Your Body and Live Actively” (EPaL) for Malaysian adolescents
Sharifah Intan Zainun SI, Chin YS, Zalilah MS and Mohd Nasir MT



warm nourishment



warm up your body



warm moments

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- * Easy To Digest
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- * High Calcium & Zinc
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Suitable for:

1. Allergy
2. Lactose intolerance
3. Gastric
4. Diabetes
5. Hypertension
6. Osteoporosis
7. Malnutrition
8. Low immune system
9. Women in pregnancy, childbirth & lactation period



*suitable for 1 year old and above

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VITAGEN Regular

A trusted cultured milk drink loved by all Malaysians, VITAGEN Regular, infused with billions of good bacteria, comes in a variety of delicious flavours made with real juice from apples, grapes, oranges and LB (natural).

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✓ NESTLÉ KOKO KRUNCH® contains 8g* of WHOLE GRAINS in every serving.

✓ WHOLE GRAINS provide more nutrients than foods like white rice and white bread.

*1 serving of wholegrain = 16g



**Based on 1 serving of each food item.

NESTLÉ KOKO KRUNCH® is based on 30g per serving.

OUR COMMITMENT TO NUTRITION

all NESTLÉ BREAKFAST CEREALS popular with kids and teens will:

Contain 9g of total sugars or less per serving***



Contain 135mg of sodium or less per serving***



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Be made with Whole Grain as a main ingredient



Be a source of Calcium



The importance of tailored nutrition in supporting children's cognitive development

DUTCH LADY



Nutrition plays an important role in the cognitive development of children. Recent research on Malaysian children's nutrition (Southeast Asian Nutrition Surveys - SEANUTS), indicates that children who are undernourished (thin, under-weight and stunted) and overnourished (over-weight, obese and severely obese) have a higher probability of scoring below average and having low non-verbal IQ scores¹. Malnutrition during these childhood years may affect brain development and therefore cognitive performance.

Tailoring of nutrition according to children's stages of development (milestones) can help meet their differing physical and mental growth requirements and support them in their progress from one milestone to the next.



CURIOUS 1-2 years old

Vision is a necessary tool for a curious child.

At the age of 1-2 years, a child becomes curious and very eager to find out more about the world. One of the most important senses for learning and memory at this stage is vision. At this stage, they start to learn and remember what they see in their surroundings.

Important nutrients for this stage:

Nutrient Required	Benefit
DHA	Brain Development ¹
Vitamin D	Active absorption of dietary calcium ²
Taurine	Antioxidants for protection of eyes and brain ³
Vitamin A	Supports visual functions ⁴
Inositol	Forms clear eye lenses ⁵



EXPLORE 2-4 years old

Supporting a child's immunity gives the child freedom to explore.

Moving on from the curious stage, a child starts to explore and learn about their surroundings. When kids at 2-4 years explore their surroundings, they touch, feel and taste the things they see. They will put things into their mouths as they explore. Doing this will challenge their immune systems.

Important nutrients for this stage:

Nutrient Required	Benefit
DHA	Brain Development ¹
Selenium	Neutralises free radicals and develops host body defences ⁶
Zinc	Active absorption of dietary calcium ²
Vitamin D	Maintains normal nerve and muscle functions ²
Magnesium	



CREATE 4-8 years old

Supporting a child's adaptability and flexibility in thoughts unleashes creativity.

Children within the age of 4-6 years are highly creative, with a natural tendency for fantasy and experiment. Creativity is essentially a form of problem solving and involves adaptability and flexibility of thought. Brain and cognitive development are very important at this stage, as children learn, memorise and make connections.

Important nutrients for this stage:

Nutrient Required	Benefit
DHA	Brain Development ¹
Vitamin D	Active absorption of dietary calcium ²
Tyrosine	Mental alertness ⁷
Choline	Memory enhancement ⁸
Magnesium	Helps in attention ⁹



LEARN 6 years and above

A child learns well with better concentration and memory skills.

When a child turns 6, emphasis is placed on learning better in school with focus and memory gaining importance. An important factor to help a child achieve that is good rest and proper sleep.

Important nutrients for this stage:

Nutrient Required	Benefit
DHA	Brain Development ¹
Magnesium	Memory enhancement ¹⁰
Vitamin D	Active absorption of dietary calcium ²
Vitamin B ₆ and B ₁₂	Energy production and improves brain functions ^{11,12}
Casein	Relaxation and proper sleep ¹³

Formulated milk powder for children

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DUTCH
LADY



Formerly known as Dutch Lady 123



Formerly known as Dutch Lady 456



Formerly known as Dutch Lady 6+



5x DHA*



Nutri
Plan™

TAILORED FOR SMART MILESTONES

As children grow, their ability to learn develops too.

They progress through different stages of smartness, first growing **CURIOS** about the world, then starting to **EXPLORE** their surroundings, and beginning to **CREATE** as they become more creative and imaginative. Then as they enter school, their priority is to **LEARN**.

All the while, they're getting smarter!

The new Dutch Lady Nutri Plan™ with 5x DHA* is able to provide tailored nutrition to support this development, allowing your child the best at every smart milestone.

Dutch Lady Nutri Plan™ with 5x DHA* is a range of formulated milk powder for children

* Compared to previous formulated milk powder for children formulation (Year 2009)

** Volume & value market share calculation based on data reported by The Nielsen Company Retail Audit Data subscription for annual period ending October 2014

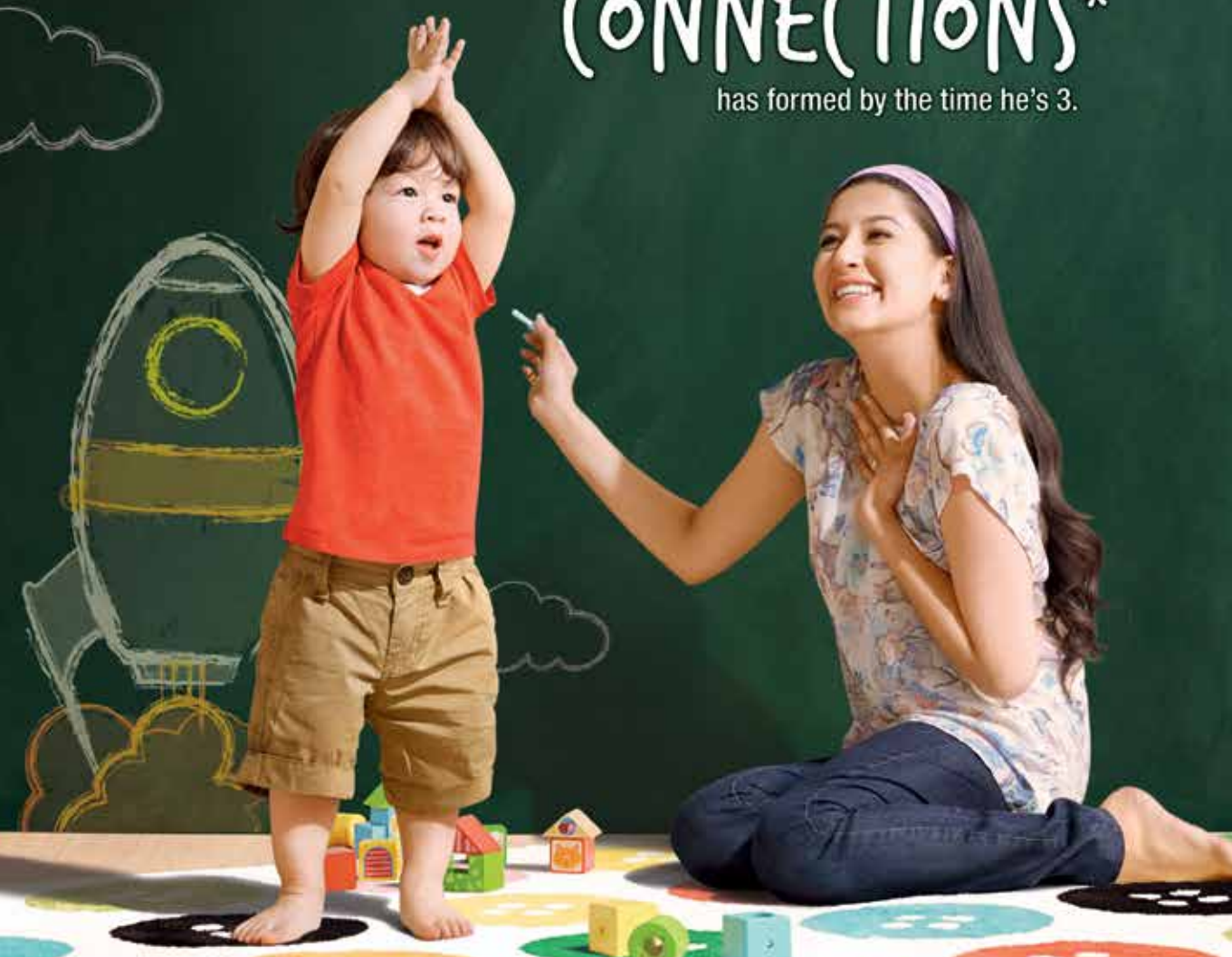
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≈ 1,000 TRILLION BRAIN CELL (CONNECTIONS)*

has formed by the time he's 3.



Connect your child's brain cells today.**

Your child's development wonders are a sign that their brain cells are connecting. The right nutrition and interaction from you can stimulate brain cell connection, every step of the way. Annum Essential with GA* & DHA.

When brain cells connect, the amazing happens.

*Ozai M. 2012

**Proper nutrition and stimulation are important for brain cell connections.

ACPA/LS/13001505



**Horlicks**gsk

Breakfast Everyday

Horlicks Everyday

There are 3 out of 10 primary school children in Malaysia skips breakfast^[1] [2] and this trend is reported to be the most missed meal among Malaysian children^[3].

Breakfast is the most important meal of the day. It is not only important to take breakfast regularly but also to consume healthy breakfasts for the daily nutrition requirements needed by the body. Horlicks complements the nutritional value needed as it is power packed with 23 vital nutrients which are crucial for overall growth and development.



**HORLICKS IS POWER
PACKED FOR GROWTH**



**Protein To Build
Body Tissues**



**Calcium For
Strong Bones**



**Multi-Vitamins
Supporting Growth**



**GROW
DAILY
DRINK
DAILY**



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- For Horlicks Original & Chocolate Malt range.

360° Development for Your Child's Exceptional Learning



Well-rounded development in **Intellectual, Motor, Emotional and Communication skills** helps your child excel in learning.

Enfagrow A+ with **360° MiND PLUS** provides **75mg DHA^A** to help meet expert recommendations[■] for daily DHA intake. DHA together with key nutrients such as Choline, Zinc, Iodine, Iron and Vitamin B help support your child's well-rounded development.



#1 BRAND
Children Nutrition Milk Formula
IN THE WORLD*



^A In 3 servings per day.

■ FAO/WHO recommends daily DHA intake of 10-12mg/kg body weight for children 12-24 months or 100-150mg DHA+EPA for children 2 years old and above. Reference: FAO 2010, Fats and fatty acids in human nutrition. Report of an expert consultation. FAO Food and Nutrition Paper no. 91. FAO; Rome.

* Market share calculation is based in part on data reported by The Nielsen Company through its Nielsen Global Track and Global Snapshot services for Annual Period Ending December 2014.

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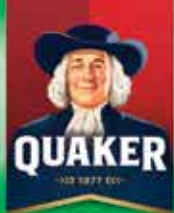
Enfagrow A⁺



#1 BRAND
Children Nutrition Milk Formula
IN THE WORLD*

* Market share calculation is based in part on data reported by The Nielsen Company through its Nielsen Global Track and Global Snapshot services for Annual Period Ending December 2014.





High Cholesterol Levels?

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- ✓ Helps to Reduce Blood Cholesterol Levels*
- ✓ Helps to Lower the Rise of Blood Glucose Levels*
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Available at Guardian, Tesco and selected pharmacies.



WITH BETA GLUCAN



2X THE FIBRE*** BENEFIT



SOURCE OF PROTEIN



SOURCE OF MAGNESIUM



SOURCE OF IRON

* 3g of beta glucan daily, as part of a diet that is low in saturated fat and cholesterol and a healthy lifestyle, may help reduce blood cholesterol levels and lower the rise of blood glucose levels** (1).

** Provided it is not consumed together with other food. Consult your medical professional for advice regarding the consumption of this product.

Soluble fibre and insoluble fibre. *Source: Euromonitor 2010.

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1. Food Quality Control of the Ministry of Health Malaysia. (2010, June 28). Nutrition Labelling Claims Regulations Enforced in Malaysia. Retrieved September 27, 2014, from NutriWeb Malaysia: <http://www.nutriweb.org.my/article.php?skd=80>

NUTRITION IN UNILEVER MEANS BETTER PRODUCTS, BETTER DIETS, BETTER LIVES FOR OUR CONSUMERS



OUR STRATEGY

As one of the world's largest food manufacturers, we follow a simple strategy for nutrition: **better products help people to enjoy better diets and live better lives.**

That's why offering great tasting products made with good ingredients, providing choice across our range with products lower in calories, and improved nutritional profiles without compromising on taste and quality is part of our heritage. This approach is firmly embedded in our business and R&D strategy.



BETTER PRODUCTS

We have been applying a global approach on nutritional improvements for more than ten years across Unilever. In 2003, we launched our Nutrition Enhancement Programme (1), which drove significant reductions in saturated and trans fats, salt and sugar from across the total portfolio. The Unilever Sustainable Living Plan (2) sets time-bound nutrition targets that cover our total range of products, in all geographies. The majority of our products already meet national nutrition standards - but we go further. We have committed that, between 2010 and 2020, we will double the proportion of our portfolio that meets highest nutrition standards (3). We report our progress annually and in 2014, our reporting methods were independently assured by Price Waterhouse Coopers.

Our ambitious nutritional targets can help hundreds of millions of people to enjoy great food and healthier diets.



Double the proportion of Portfolio meeting Highest Nutritional Standards by 2020

75% of Foods to meet 5g salt/d criteria by 2020

Trans fat from PHVO removed from all products by 2012

Saturated fat $\leq 33\%$ * in 90% soft vegetable oil margarines by 2017

Reducing sugar by 25% in Ready to Drink Powdered Ice Tea and Milk Tea by 2020

All childrens ice creams ≤ 110 kcal/ portion by 2014 and 80% packaged ice creams ≤ 250 kcal/ portion by 2015

*38% SAFA for tropical countries



Improving heart health awareness



Providing healthy eating information on all our products by 2015



Improving employee health and nutrition by 2020

BETTER DIETS – BETTER LIVES

Product reformulation alone is not enough to stimulate dietary changes among consumers. We work with many health influencers (ranging from chefs to public health authorities) to explain how our products fit into a healthy diet and to encourage healthier eating.

WORKING WITH OTHERS

We need to work together with others to drive better public health outcomes. When developing and launching our products and campaigns, we seek the advice of nutrition and health experts. Our global community of around 170 nutritionists maintain relationships with local experts and public health organisations to share knowledge and insights on the scientific, nutritional and health issues relevant to our brands. We also collaborate with hundreds of research partners, and we share our research through external presentations at scientific conferences and in peer-reviewed publications.

RECOGNITION

In 2014, we achieved a 100% score within the Health & Nutrition criterion for the fifth year in a row in the Dow Jones Sustainability Indices (DJSI) and actually were named leader of our industry group in the 2014 RobecoSAM Corporate Sustainability Assessment.

In 2013 we came second in the inaugural Access to Nutrition Index (ATNI) which publicly rates the world's 25 largest food and beverage manufacturers

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Abstracts

Day 1

Symposium 1: Infant & Child Nutrition

First 1000 days of life: evidence from the USM Pregnancy Cohort Study

Hamid Jan b Jan Mohamed

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The first 1000 days of life concept originated from research findings of several birth and pregnancy cohort studies around the world. However, the pioneer of this concept was the late Professor Barker who suggested the Developmental Origins of Health and Disease hypothesis (DOHaD) based on his findings from old birth records in the United Kingdom. The DOHaD concept describes how during early life (from conception till early childhood), the unhealthy maternal diet, poor maternal health status and the polluted environment during pregnancy trigger changes in fetal development that leads to long term detrimental effect by modulating risks of non-communicable disease across the life course. Poor dietary intake and exposure of polluted environment during early childhood also contributes to non-communicable disease development in later life. However, the DOHaD concept was not tested in the local population. Hence, upon discussion with DOHaD experts, a local pregnancy cohort was initiated and named as the USM Pregnancy Cohort Study. The background and design of this cohort will be presented. Findings that indicated the association of maternal environment based on the aspects of prenatal dietary intake and nicotine exposure with birth outcomes will be discussed.

The association between maternal post partum anemia and low birth weight

Yenni Zuhairini, Gaga Irawan Nugraha

Department of Medical Nutrition, Faculty of Medicine, Universitas Padjadjaran, Bandung, Indonesia

Maternal anemia has reported as one of the most contributed factor of low birth weight. Apart from that, there was no consistency in the timing of hemoglobin considered for analysis. Hence, the present study was designed to an observational study to look into these aspects and investigate the outcome of pregnancy in patients with anemia. A prospective population-based study comparing all singleton pregnancies of patients with and without anemia was performed. Deliveries occurred during the years 2014 in Tanjungsari the Sub-district, West Java, Indonesia. Maternal anemia was defined as hemoglobin concentration lower than 10 g/dl and 11 g/dl during pregnancy and post partum respectively. The association between anemia and low birth weight (<2500 g) was tested using Chi-square. During the study period there were 41 deliveries, which were high rates of anemic women found not only in trimester 1, 2, and 3 but also after delivery (71.1%, 44.9%, 55.3% and 80.5%; respectively). Meanwhile only post partum anemia has association with low birth weight (OR = 9,3 CI 1.7–52,0, $p < 0.02$). Higher rates of low birth weight were found among patients with anemia as compared to the non-anemic women (68.3% versus 7.3%, $p < 0.02$; respectively). The incidences of maternal anemia were high in various trimesters. Only post partum anemia has significant association with low birth weight in our population.

The effectiveness of breastfeeding intervention programme on self-efficacy and breastfeeding outcomes among Malay mothers in Seremban, Negeri Sembilan

Huzaimah H & Zaleha MI

Department of Community Health, Faculty of Medicine, Universiti Kebangsaan Malaysia Medical Centre

Breastfeeding practices in Malaysia especially exclusive breastfeeding below six months after delivery was still below the recommended target. The purpose of this study was to assess the effectiveness of breastfeeding intervention programme based on Breastfeeding Self-Efficacy Theory among Malay mothers in Seremban, Negeri Sembilan. A quasi-experimental study was conducted among 203 antenatal mothers (100 in the intervention group and 103 in the control group). There were 96 respondents in the intervention group and 98 respondents in the control group completed the study until the end. The respondents in the intervention group received two sessions of antenatal education and two sessions of proactive short message service (SMS) during the first month of postnatal period in addition to standard breastfeeding education and support; while respondents in the control group received standard breastfeeding education and support. The effectiveness of the programme was assessed by self-administered questionnaires on breastfeeding practices and breastfeeding self-efficacy scores serially until six months postnatal. The breastfeeding intervention programme gave a moderate effect size on the breastfeeding self-efficacy scores among respondents in the intervention group as compared to the control group ($p < 0.001$) and within the intervention group itself ($p < 0.001$) across one month, three months and six months postnatal. Furthermore, there was a statistically significant increase in exclusive breastfeeding practices at six months postnatal among intervention group as compared to the control group (48.0% versus 12.2%; $p < 0.001$). The findings in this study suggest that breastfeeding intervention programme based on Breastfeeding Self-Efficacy Theory has significantly improved the maternal breastfeeding self-efficacy and breastfeeding exclusivity at six months postnatal.

Nutrient levels of foods served in kindergartens in Kota Kinabalu, Sabah

Mun LH and Ooi YBH

Faculty of Food Science and Nutrition, University Malaysia Sabah, Jalan UMS, 88440 Kota Kinabalu, Sabah

Adequate nutrition intake during all meals is important for preschoolers because of their high energy expenditure and small stomach capacity. Thirty privately operated kindergartens for children aged 4 to 6 years in Kota Kinabalu were randomly selected. Most kindergartens have 15 children, and operated from morning until noon. One morning snack was served during this period. Median cost of food served was RM1/child/day. Three children were randomly selected from each kindergarten and the weight of food consumed by them was weighed. Mean energy consumed was 176.3 ± 51.9 kcal, protein 5.2 ± 3.0 g, carbohydrate 24.8 ± 8.9 g, fat 6.2 ± 3.9 g. Preschoolers usually need to consume about five meals per day. Therefore their nutrient consumption for one meal should be between $\frac{1}{5}$ to $\frac{1}{4}$ of the recommended levels. More than 90 percent of kindergartens provided less than $\frac{1}{5}$ of recommended levels for energy, vitamins A, B1, B2 and C. All kindergartens provided less than $\frac{1}{5}$ recommended level for calcium. Thirteen kindergartens provided more than $\frac{1}{4}$ of recommended level for protein. All kindergartens did not serve fruits on days when food intake was weighed. Mean vegetable consumption was 0.07 ± 0.1 serving. The vegetables were usually found as a few finely cut pieces in noodles or rice. There was

no significant difference in nutrient consumption levels in kindergartens with median cost of food less than RM1/child/day and those with cost more than RM1/child/day ($p>0.05$, Mann-Whitney test). Parents in 8 kindergartens (26.7 percent) supplied milk or formula to the kindergartens to be given to their children in kindergarten. In conclusion, fruit and vegetable should be increased in kindergarten meals. Kindergarten operators might require education in encouraging children to eat fruits and vegetables to ensure good nutrition to pre-schoolers and to inculcate good eating habits.

Picky eating: normal development or a disorder

Rajini Sarvananthan

Park City Medical Centre

Picky eating is commonly seen in toddlers up to school age and often causes distress in families as well as health professionals. Often there is the urge to intervene with nutritional supplements. Prior to intervening, professionals have to first be able to decide if it is necessary to intervene and how best to intervene. Prior to being able to address this issue in clinical practice, clinicians have to understand the developmental changes that toddlers go through which affect their eating habits. It is also important for us to use evidence based practices to ensure that these children continue to grow and develop in these important early years.

Symposium 2: Infant & Child Nutrition

The relationship between dietary patterns and overweight and obesity in children of Asian developing countries: a systematic review

Yang WY^{1,2}, Williams LT¹, Collins CE¹ and Chee WSS²

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² Department of Nutrition and Dietetics, School of Health Sciences, Faculty of Medicine and Health, International Medical University, Malaysia

Developing countries in Asia are at particular risk of exponential increase in prevalence of childhood obesity due to their stage in the epidemiological and nutrition transition. The review aimed to summarize the evidence on prevalence of childhood overweight and obesity within Asian developing countries and to synthesise the best epidemiological association between the children's dietary patterns and their body weight status. This review considered any analytical observational studies that included children under 18 years of age who live in developing countries in Asia. A three-step search strategy was utilised; an initial limited search of MEDLINE, CINAHL and EMBASE to identify search terms from inception to September 2011, with an English language restriction. A second search using all identified keywords and index terms was undertaken and thirdly, searching the reference list of all identified reports and articles for additional studies. All selected papers were assessed independently by two reviewers using standardised critical appraisal instruments from the Joanna Briggs Institute. Data was extracted from included studies using an adapted version of the standardised data extraction form. Meta-analysis was not possible because of the heterogeneity of studies in terms of methodology, statistical analyses and outcomes. Fifteen studies were included in the review. The prevalence rates of childhood overweight

and obesity in Asian developing countries ranged from 5.1% and 19.9% with no specific trend in age or gender. Several significant but inconsistent statistical associations between dietary patterns and overweight/obesity in children and adolescents were found; high energy diet, low intake of fruit and vegetables, high meat consumption, eating out, fast food intake, presence of snacking and drinking sugar sweetened beverages. There is a need for valid measures of dietary intake and use of standardised international cut-offs for overweight and obesity in Asian developing countries.

An exploratory study on risk factors for chronic non-communicable diseases among adolescents in Malaysia: overview of the Malaysian Health and Adolescents Longitudinal Research Team study (The MyHeART study).

Hazreen AM¹, Su TT¹, Jalaludin MY², Dahlui M¹, Chinna K³, Murray L⁴, Cantwell M⁴, Al Sadat N¹; MyHeART Study Group

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²Department of Paediatrics, Faculty of Medicine, University Malaya, 50603 Kuala Lumpur, Malaysia

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The National Health & Morbidity Survey (NHMS) IV (2011) observed that the prevalence of obese children aged less than 18 years in Malaysia is 6.1% compared to 5.4% overweight and obese in NHMS III (2006). As such, this observation is of public health importance as obesity is a forewarning risk factor for chronic diseases such as type-2 diabetes, cardiovascular diseases (CVD) and certain types of cancers. This MyHeART (Malaysian Health and Adolescents longitudinal Research Team) study aims to examine risk factors of non-communicable diseases (NCD) among adolescents. The MyHeART study is longitudinal cohort study of 1361 schoolchildren (13-years old) attending 15 public secondary schools from the central (Kuala Lumpur and Selangor) and northern (Perak) regions of Peninsular Malaysia. The study used a stratified sampling design to select the study participants. Data collected at baseline included socio-economic, lifestyle (e.g. smoking, physical activity assessment, fitness assessment, seven-day diet history), and environmental information, anthropometric measurements, blood pressure, handgrip strength and bone mineral density. Blood samples for fasting blood glucose and lipid profiles, full blood count, renal profile, as well as bone profile and serum vitamin D were taken. This study cohort will be followed up again when participants turn 15, 17 and lastly, after a period of ten years (around the age of 27). Nine percent of the adolescents from this study were obese. More male participants smoked compared to female participants (15.4% vs. 4.7%). Adolescent males had higher fasting blood glucose but the female participants had lower high density lipoprotein (HDL-cholesterol) and higher low density lipoprotein (LDL-cholesterol). In addition, adolescents from the rural area had higher fasting blood glucose, diastolic blood pressure, total cholesterol and LDL-cholesterol. The prevalence of metabolic syndrome was 2.6% in the population and 10% from the overweight and obese adolescents. Participants who slept between 7 and 9 hours a day has a lower risk of developing metabolic syndrome OR 0.38 (0.15-0.94). 43.3% of the participants were categorised into the unacceptable fitness group, 47.1% were considered marginally acceptable, and 9.6% were acceptable.

Our results demonstrated that adolescents from the rural area are at higher risk of NCDs compared to their urban counterpart. Most participants were physically unfit. Tailor made public health interventions are highly recommended for adolescents as this may minimise the dreadful NCD burden in adulthood and health disparity between the rural and urban in the near future.

Factors associated with disordered eating among adolescents: does body image play a role?

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This presentation discusses previous findings on the relationship between body image and disordered eating. Subsequently, a cross-sectional study determining factors associated with disordered eating among 419 adolescents in Sepang, Selangor is presented whereby BMI, waist circumference, body image, psychological factors, sociocultural influences, eating patterns and disordered eating were assessed using Anthroplus, a non-extensible tape, Contour Drawing Rating Scale, Depression, Anxiety and Stress Scale, Sociocultural Influences on Body Image and Body Change Questionnaire, Modified Youth Risk Behavior Surveillance Questionnaire and Eating Attitude Test respectively. Overall, 44.6% of the respondents were males and 55.4% were females involving 56.3% Malay, 22.5% Indian, 14.1% Chinese and 4.1% Others. The mean age of the respondents was 14.57±1.05 years whereas their mean household income was RM2875.88±2356.35. The prevalence of overweight and obesity, thinness and severe thinness, abdominal obesity and disordered eating were 28.1%, 6.0%, 21.0% and 32.0% respectively. Around 35.5% were incorrect estimators of body weight but 78.0% were dissatisfied with their body size. Among them, 10.2%, 27.5% and 8.6% were severely and extremely severe in depression, anxiety and stress respectively. The mean scores of perceived pressure to lose weight and gain muscles were both highest for media. The mean number of days/week for consumption of vegetables, fruits, carbonated drinks, milk and breakfast was highest for vegetables (4.59±2.28 days). Monthly household income ($r=-0.146, p<0.01$), waist circumference ($r=0.103, p<0.05$), body discrepancy score ($r=0.098, p<0.05$), fruit intake patterns ($r=0.134, p<0.01$), perceived pressure to lose weight by father ($r=0.451, p<0.001$), mother ($r=0.412, p<0.001$), peers ($r=0.447, p<0.001$) and media ($r=0.372, p<0.001$), perceived pressure to gain muscles by father ($r=0.376, p<0.001$), mother ($r=0.381, p<0.001$), peers ($r=0.286, p<0.001$) and media ($r=0.335, p<0.001$), depression ($r=0.265, p<0.001$), anxiety ($r=0.274, p<0.001$) and stress ($r=0.308, p<0.001$) were significantly associated with disordered eating. Multiple linear regression analysis showed eight factors, namely, perceived pressure to lose weight by father, stress, perceived pressure to lose weight by peers, being Indian, perceived pressure to gain muscles by father, being female, monthly household income, and perceived pressure to gain muscles by media were predictors of disordered eating explaining 37.8% of the variance. Some results from an ongoing cohort study are discussed and recommendations for future research suggested. Implications on planning for intervention programs targeting disordered eating among adolescents should consider these results.

S.M.A.R.T program based on latest Malaysian Dietary Guideline improves nutrition knowledge, attitude and practices for the primary school children: A preliminary study

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Concerted efforts had done between Ministry of Health and Ministry of Education in order to improve the nutritional status among school children with alarming risen of the children obesity in last two decades. Furthermore, NSP-NCD also emphasize on health promotion and education in strategy 7. Studies reported that healthy eating habits cultivated in young and will normally be practiced in adulthood. Therefore, nutrition education is essential to be conveyed early age. SMART educational program based on the key messages of Malaysian Dietary Guidelines had newly introduced. The study aimed to evaluate changes of knowledge; attitudes and practices of the primary school after undergo the SMART program. A total of 430 students from four primary schools were randomly selected with 213 students in intervention group and others (n=218) served as controlled group. Only intervention group received the SMART program. Self administered questionnaire done by students before (pre-intervention) and after (post intervention) and follow up tests after 6 months of the SMART program had completed. Statistically shown knowledge score had significantly increased from $54.37 \pm 14.27^{***}$ at pre-test to $64.30 \pm 16.65^{***}$ in post test and $57.63 \pm 16.40^{***}$ follow up test among the intervention group. Besides, the attitude for intervention group reported as 51.83 ± 17.51 and 54.32 ± 19.93 for pre-test and post test. The nutrition practice for intervention group also revealed significantly increased from $48.64 \pm 15.98^{**}$ for pre test, $52.02 \pm 18.67^{**}$ for post test. However, there was no significant improvement for follow-up group in attitude and practice scores respectively. There result further indicated no significant changes for pre, post and follow up test for controlled group. The findings support the importance nutrition education of providing students with interactive nutrition knowledge to promote healthy dietary behaviors. Therefore, the major MDG messages through continuous nutrition school based educative program are vital for children who are the leader of tomorrow nation.

Note: ** (p<0.05), ***(p<0.01)

Symposium 3: Young Researcher's Symposium

A beneficial influence of omega-3 fatty acid on DXA-derived indices of bone health in healthy postmenopausal Chinese women in Kelantan

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Adequate intakes of omega-3 fatty acid (ω -3FA) is important to maintain optimal health status due to its significant protective effects on cardiovascular system, but limited evidences of health effects on musculoskeletal health status among the populations across lifespans. Therefore, the main objectives of the present study was to determine the relationships between habitual ω -3FA intakes and bone health status among 103 apparently healthy postmenopausal Chinese women aged 50 years and above in Kelantan. Pre-piloted self-administered questionnaires on socio-economic status, habitual dietary and lifestyle behavioural practices were assessed, while dietary nutrients intake were calculated using food frequency questionnaire (FFQ). DXA-derived indices of bone health such as bone mineral density (BMD), bone mineral content (BMC) and bone area (BA) of the whole body (WB), lumbar spine (L2-L4) (LS) and proximal femur (PF) were assessed using dual-energy χ -ray absorptiometry (DXA). The mean age of the participants was 57.4 ± 5.3 y, with the mean age of menopause was 49.8 y. Mean daily intakes of ω -3FA was 0.15g. Adjusted correlation coefficient test showed that daily intakes of ω -3FA (*log*) was significantly associated with BMD levels of WB ($p < 0.05$), LS ($p < 0.01$) and PF ($p < 0.05$), and BMC ($p < 0.05$) and BA ($p < 0.05$) of the WB, after adjusting for age, age of menopause, years since menopause, number of children, and daily intake of energy and calcium. Multivariate analyses (ANCOVA) showed that women with higher intakes of ω -3FA had significantly associated with higher WBBMC and WBBA and LSBMD (All, $p < 0.05$) compared to those women at low intake group, after adjusting for confounding factors. There was no significant association between other dietary fat profiles such as total fat, monounsaturated fatty acids, polyunsaturated fatty acids and omega-6 fatty acid, and DXA-derived bone indicators assessed. These findings ω mass among postmenopausal Chinese women in Kelantan.

Prevalence of disordered eating and its associated factors among primary school children in Selangor, Malaysia

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This cross-sectional study aimed to determine the prevalence of disordered eating and its associated factors among children aged 10 to 11 years in Selangor. A total of 816 children (35.1% males and 64.9% females) from 12 randomly selected primary schools involved in this study. Children completed a set of self-administered questionnaire on disordered eating, socio-demographic characteristics (sex, ethnicity, parental monthly income, pubertal development), body weight status, psychological factors (self-esteem, depression, health specific self-efficacy, body size satisfaction), socio-cultural factors (perceived pressure to lose weight, gain weight and increase muscle tone from parents, peers and media) and

behavioral factors (meal skipping behaviors, snacking behaviors, fast food consumption, dietary intake, physical activity level). The prevalence of disordered eating was 30.8% [Males: 32.8% (95% CI: 27.3-38.8); Females: 29.7% (95% CI: 25.8-33.9)]. Indian (39.9%; 95% CI: 29.3-51.40) showed the highest prevalence of disordered eating, followed by Malay (33.6%; 95% CI: 29.7-37.8) and Chinese (17.0%; 95% CI: 11.8-23.8). Children who were in advanced and post-pubertal stage had the highest prevalence of disordered eating (44.6%; 95% CI: 33.0-56.7). Those who consumed fast food at least once a week showed the highest prevalence of disordered eating (38.4%; 95% CI: 32.6-44.5). Socio-cultural pressures to lose weight among children with disordered eating (32.4; 95% CI: 31.0-33.8) was higher than those without disordered eating (27.6; 95% CI: 26.7-28.4). Multivariate logistic regression analysis showed that being an Indian (OR = 2.111; 95% CI: 1.082-4.120) or Malay (OR = 1.758; 95% CI: 1.081-2.858), fast food consumption at least once a week (OR = 1.530; 95% CI: 1.058-2.214), higher pubertal development scores (OR = 1.077; 95% CI: 1.009-1.151) and higher socio-cultural pressures to lose weight (OR = 1.035; 95% CI: 1.016-1.054) were risk factors of disordered eating. No significant associations were found between sex, parental monthly income, body weight status, psychological factors, meal skipping behaviors, snacking behaviors, dietary intake and physical activity level with disordered eating. In conclusion, one third of the children had disordered eating. Interventions for the prevention of disordered eating are imperative to ensure healthy growth of Malaysian adolescents.

The H.E.B.A.T! Program: A randomized control trial intervention to combat childhood obesity in Negeri Sembilan, Malaysia

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The prevalence of childhood obesity is increasing throughout the world and can be associated with significant short- and long-term health consequences. Thus, obesity prevention and treatment should start early in life and should target modifiable behaviours that influence energy intake and expenditure. The H.E.B.A.T! programme aims to improve weight status, eating habits and physical activity of overweight children aged 10-11 years old in Negeri Sembilan. Two primary schools with the highest rate of overweight and obesity in Seremban were selected and randomly assigned as intervention and control. A total of 43 children (69.7% boys; 30.3% girls) participated in the study. The intervention group underwent two series of 3-day camps, and had regular school-based fun activities to engage in healthy eating and active lifestyle, and participated in a healthy weight competition. Parents of children in intervention group attended a half-day workshop to enable them to create supportive environments at home for their children. Process evaluation was conducted to assess the implementation of intervention activities. Results show there was full participation and that the programme was delivered as planned. Primary outcomes, such as BMI Z-score, body fat percentage, waist circumference, sleep habit, dietary habit, self-esteem and pedometer stepcounts were measured at baseline, and post intervention (3 months and 6 months). There were no significant differences between intervention and control groups at baseline for these parameters. At six months, intervention group showed significant improvement in waist circumference, average stepcount, self-esteem score and certain dietary habits (plain water, fruits and breakfast intake). In conclusion, the intervention made an impact on positive behavioural intentions and improves weight

status of the children. We expect the H.E.B.A.T! programme to be a pioneer that could be adopted and implemented by the government and private sector as well as policy makers in formulating childhood obesity intervention.

Factors associated with body weight status among welfare home children in Selangor, Malaysia

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This cross-sectional study was conducted to determine the associations between socio-demographic characteristics, psychological, and lifestyle factors with body weight status among welfare home children in Selangor. While information on studied variables was obtained using self-administered questionnaires, height and weight were measured by trained researchers. BMI-for-age was classified based on the WHO Growth Reference 2007. The study sample was 307 school-going welfare home children (mean age of 13.0±2.7 years old) from 15 selected welfare homes, with 51.5% were males and 48.5% were females. There were three types of welfare home children in the study, including orphans (54.4%), abandoned children (23.8%), and children from problematic family (21.8%). The prevalence of overweight and obesity (23.1%) was three times higher than thinness and severe thinness (8.5%). The findings reported that age ($r=0.169$, $p=0.003$), satiety responsiveness ($r=-0.123$, $p=0.031$), satisfaction of body size and shape ($r=0.551$, $p=0.0001$), self-esteem ($r=-0.112$, $p=0.049$) and energy expenditure per kilogram body weight ($r=-0.550$, $p=0.0001$) were correlated with BMI-for-age. Besides, there were differences in BMI-for-age by sex ($t=-3.992$, $p=0.0001$), ethnicity ($F=5.358$, $p=0.001$), type of welfare home children ($F=5.926$, $p=0.003$), perception of body weight status ($F=6.523$, $p=0.0001$) and dietary supplement consumption ($t=7.700$, $p=0.031$), respectively. The multiple linear regression analysis showed that children who were females ($\beta=-0.428$), Malay ($\beta=0.602$) or Chinese ($\beta=0.437$), at older age ($\beta=-0.150$), being abandoned ($\beta=0.369$), underestimated their body weight status ($\beta=0.460$), having higher dissatisfaction with their body size and shape ($\beta=0.361$), and having lower energy expenditure per kilogram body weight ($\beta=-0.053$) contributed to the variances in higher BMI-for-age ($R^2=0.566$, $F=48.515$, $p<0.05$). In conclusion, overweight and obesity problem was more prevalent than underweight problem among the welfare home children in Selangor. Hence, periodic assessment is essential to monitor their body weight status. The reported findings could be used as guidelines for planning nutrition intervention program among welfare home children.

Effects of an intensive physical activity education on knowledge, attitude, and practices of physical activity in overweight/obese adolescents: A pilot study of C.E.R.G.A.S intervention programme

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Physical activity (PA) knowledge is crucial in enhancing adolescents' awareness of the importance of an active lifestyle. This pilot study of the C.E.R.G.A.S. (*Ceria, Respek, Gigih, Aktif, Sehat*) programme aimed to examine the effects of an intensive camp-based education on PA knowledge, attitude and practices (KAP) among overweight/obese (O/O) adolescents in secondary schools. Two secondary schools in Selangor were assigned as either intervention (IG) or control (CG). The IG students (n=46, 13.2±2.3 year-old) received additional PA education taught by a physical education expert and a sports scientist in a two-day camp at a training centre, apart from the standard Physical and Health Education school curriculum. During the camp, in addition to theoretical lessons, the students were taught safe and proper exercise techniques through demonstrations, and underwent supervised exercise training sessions with qualified exercise trainers. The CG students (n=50, 13.4±2.1 year-old) only received the standard Physical and Health Education school curriculum. A validated questionnaire was used to assess KAP before and one month after the camp. The main outcome measures were changes in KAP scores. There was consistent evidence of a treatment effect on PA KAP in both boys and girls. There were significant increments ($p < 0.01$) in post-camp mean scores of knowledge ($\Delta = 3.17 \pm 1.02$), attitude ($\Delta = 2.31 \pm 1.30$) and practice ($\Delta = 1.33 \pm 1.21$) domains in IG, while no significant changes were observed in any of the three domains in CG ($\Delta = 0.58 \pm 0.28$; $\Delta = -0.17 \pm 0.10$; $\Delta = -0.20 \pm 0.11$, respectively). The findings of this pilot study indicate that intensive camp-based PA education is effective in improving KAP among O/O adolescents. We anticipate that the C.E.R.G.A.S. programme may be feasible for adoption on a large-scale by various stakeholders pending confirmation in a full-scale intervention study.

Day 2

Symposium 4: Industry Contributions in Promoting Child Nutrition

Understanding dietary fibre and its benefits

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Fibre is a non-digestible carbohydrate or lignin that occurs naturally in plant foods. In Malaysia, intake of 20 to 30 g of dietary fibre is recommended daily for all age groups. The main sources of fibre are grains, vegetables, peas and beans, fruits, nuts and seeds, and seaweed. Some processed food may include functional fibres such as resistant starch, inulin, fructo- and galacto-oligosaccharides. Small changes in food consumption can increase fibre intake. Fibre has been shown to be beneficial to gut health. Claims on beneficial effect of specific functional fibre and prebiotics have been approved in Malaysia, for example beta glucan and reduction of cholesterol. A high intake of dietary fibre, particularly viscous soluble fibre interferes with reabsorption of bile acids in the intestines and this helps reduce blood cholesterol levels. Polysaccharides in tropical seaweed form indigestible ionic colloids which increases faecal cholesterol excretion. Consumption of plant based foods and dietary fibre are associated with lower risk of major weight gain. There are epidemiological data to show an inverse relationship between dietary fibre consumption and colorectal cancers. Intake of dietary fibre appears to improve blood glucose regulation in individuals with Type 2 diabetes.

Slowly available carbohydrates and natural dietary fibres for a better metabolic set up – be prepared for the future!

Sentko A

Vice President Regulatory Affairs & Nutrition communication, BENEIO GmbH/BENEIO Institute, Germany

Early programming of the metabolism seems to be the keyhole for 'getting older healthier' and 'be healthy and stay healthy in your life'. The key for a healthy life that fits into this keyhole is optimized nutrition. The key bit, if I may continue with this metaphor, are smart macronutrients that support a good metabolic set up. Carbohydrates deliver more than 50% of the daily caloric intake and the smart choice, the quality of carbohydrates, matters. A smart choice for an available carbohydrate is isomaltulose, a unique slowly and fully available carbohydrate. An overview addressing the manifold metabolic advantages that this unique carbohydrate can deliver from pregnancy towards childhood and later in life will be provided. Another smart choice for a dietary fibre, also belonging to the category of carbohydrates, is chicory root fibres, also known as inulin and oligofructose (FOS). These natural fibres are extracted by hot water from the root of the chicory plant. Hundreds of human intervention studies are published demonstrating the physiological benefits of these particular natural dietary fibres. Chicory root fibres are proven prebiotics, i.e. they stimulate the normal gut flora by supporting in particular those bacteria you want to have more of. The saccharolytic fermentation process in the large intestine that is triggered by chicory

fibres is linked to e.g. the support of normal bowel movements (avoiding constipation) as recently also confirmed by EFSA. Exciting recent research addresses the mechanism behind the fact that chicory root are helping to eat less, naturally. A very recently presented Canadian study with overweight and obese children identified prebiotic chicory fibre as a tool for supporting a healthy weight development in children.

Symposium 5a: Nutrition Potpourri

Potential effect of vitamin C on inflammation in hypertensive and/or diabetic obese adults: a randomized, controlled trial

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Background: obesity is well-associated with the increasing secretion of pro-inflammatory markers from adipose tissue interfering in the metabolic diseases such as hypertension and diabetes. Having healthy effects, vitamin C could work as an anti-inflammatory agent through its anti-oxidant capacity. Objective: to identify the effect of vitamin C on reducing the levels of inflammatory markers on hypertensive and/or diabetic obese adults. Methods and Material: sixty-four patients, who were hypertensive and/or diabetic obese and had high levels of inflammatory markers, from primary health care centers of Gaza City-Palestine, enrolled in two groups of an open-label, parallel, randomized, controlled trial. 33 patients were in control group, and 31 patients were in experimental group. Experimental group treated with 500mg vitamin C twice a day. Results: in treated group, vitamin C reduced significantly the level of high sensitivity C reactive protein (hs-CRP), interleukin 6 (IL-6), fasting blood sugar (FBS), and triglyceride (TG) after 8 weeks of treatment [Overall: $P < 0.001$], no changes appeared in total cholesterol (TC). In control group, significant reduction detected for FBS and TG [$P = 0.001$, and $P = 0.026$; respectively], and no changes for hs-CRP, IL-6, or TC. By comparing experimental group with the changes of control group at the endpoint, vitamin C achieved the clinical significance in treating effectiveness for hs-CRP, IL-6, and FBG [$P = 0.01$, $P = 0.001$, and $P < 0.001$; respectively], without significant detection for TC or TG. Conclusion: vitamin C has the potential effects in alleviating the inflammatory status by reducing CRP, IL-6, and blood glucose in hypertensive and/or diabetic obese patients in a dose-response manner during this study.

Cross-Sectional study on weekday and weekend patterns of objectively measured sitting/lying, standing and stepping in obese children

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Obese children have been highlighted as a particularly sedentary population and the possible negative effects of a sedentary lifestyle are being uncovered. Total time spent sedentary and the sedentary patterns of obese children have not been described using objective and direct measure of body inclination. Therefore, the aims of this study are to examine the patterns of objectively measured sitting/lying, standing and stepping in obese children using the ActivPAL™ and to highlight possible differences in sedentary levels and patterns during weekday and weekends. One hundred and one obese children, age 9-11 years, were recruited from urban and rural schools in Kuala Terengganu. Participants wore an ActivPAL™ monitor for 7 days to measure total time of daily sitting/lying, standing and stepping. The ActivPAL™ output was examined using a customized macro Excel 2013. The results shows that obese children tend to spend most of their days in sitting/lying (77.8%) rather than standing (14.3%) and stepping (7.9%). There is significance different found in sitting/lying during weekends compared to weekdays (19.3 hours vs 18.4 hours; p value <0.001). Significantly more sedentary bouts were accumulated during weekdays compared to weekends (p value <0.05). Sedentary behaviour was one of the factors that contribute to childhood obesity. This is the first study in Malaysia that use activPAL™ monitor to measure sedentary behaviours in obese children. Interventions that target the sedentary behaviour of obese children by displacing sitting with activity may offer most promise for reducing population levels of sedentary behaviour and physical activity levels in school children.

Juara Sihat: A school-based childhood obesity nutrition promotion programme

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This presentation describes a quasi-experimental, multi-component, school-based nutrition education program to treat childhood obesity. The aim of this study is to determine the effectiveness of nutrition education program in improving the BMI Z-score and percentage of body fat, as well as short- and long-term outcomes such as knowledge and attitudes, physical activity and eating habits among overweight and obese children. This study involved two primary schools in Kuala Lumpur with similar demographic characteristics. Eligibility criteria of subjects were overweight and obese children aged 9 to 11 years. Prior to the intervention, height, weight, BMI and waist circumference were measured; and repeated during post-intervention at the third and sixth months after intervention. Blood pressure was taken and blood was drawn after an overnight fast to test for glucose, haemoglobin, lipid profile and C-reactive protein levels. Food intake was obtained through dietary record on two weekdays and one weekend day. Socio-demographic, level of knowledge, attitudes and practice (KAP) of nutrition, and physical activity levels of children were assessed using questionnaires answered by parents and subjects. The intervention was intended as a low intensity Physical Activity program delivered in 10 group sessions. The 10-week intervention consists of six components addressing eating habits, physical activity and psychology, namely: nutritional status assessment; Malaysian Food Pyramid; healthier food choices; body image; fruits and vegetables; and physical activity. The control school did not receive any intervention. The primary outcome was BMI z-score, while other outcomes

included weight change, eating habits, biochemical profiles, physical activity level, KAP, sedentary behavior. The *Juara Sihat* program targets to improve healthy nutrition practices and physical activities, as well as to reduce sedentary lifestyles among primary school children. We believe that this nutrition education program could prove to be effective in weight reduction and in increasing awareness among children for behavioural change.

Decisional balance, self-efficacy and processes of change across the stages of change for exercise among overweight and obese Iban adults in Kuching, Sarawak

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Prevalence of overweight and obesity is increasing among the Iban in Sarawak. The objective of this study was to investigate the differences in decisional balance, self-efficacy and processes of change according to the stages of change for exercise behaviour among overweight and obese Iban adults in Kuching, Sarawak using the Transtheoretical Model of Change. Top six areas with most Iban population were purposively selected. All potential respondents aged 18-64 years were included for the quantitative questionnaire survey (n=156: 43 males and 113 females). The questionnaires consist of socio-demographic background, anthropometric data, clinical and biochemical data, International Physical Activity Questionnaire (IPAQ) long form, stages of change, decisional balance, self-efficacy and processes of change for exercise. The mean age was 44.4±11.1 years and majority were married (83.3%) and employed (51.9%) with mean monthly household income of RM1517.05±1215.26. The mean BMI was 29.75±4.18kg/m² and mean percentage of body fat was 37.84±8.27% with 96.8% of respondents had an abnormal percentage of body fat. More than half of the respondents had an abnormal total cholesterol and triglyceride respectively (55.8%, 50.0%) while 40.5% were hypertensive at risk and 16.7% with an abnormal plasma glucose. Most respondents had a high level of physical activity (74.4%) followed by moderate (21.8%) and low (3.8%). The distribution of respondents according to the stages of change showed that majority (42.3%) were at maintenance stage followed by precontemplation (19.9%), action (17.9%), preparation (10.3%) and contemplation (9.6%). The one-way ANOVA showed that the pros decisional balance, self-efficacy and processes of change (except for consciousness raising and counterconditioning) were significantly different across the stages of change. The results of this study suggest that the stages of change should be taken into consideration in designing intervention programmes in order to achieve better physical activity outcome and subsequently better health status.

A systematic review of associations between obesogenic environments and the increasing risk for obesity in children: An Asian story

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Obesogenic environments has been responsible for the obesity epidemic across the world. The rising prevalence of obesity in children especially in Asian countries is becoming a major public health concern. The primary aim of this systematic review is to identify

environmental factors related to obesity in children in Asian countries. A secondary aim was to identify research gaps on the obesogenic environment and childhood obesity in Asia. Literature searches of studies were conducted in major databases (i.e PubMed, ProQuest, EBSCO and PsycInfo) between year 2000 to year 2013, for elements of the obesogenic environment as described by Swinburn et al 1999 (ANGELO framework - Physical, Economic, Sociocultural and Political). Additional articles were located by citation tracking from the references provided. Fifteen articles met the inclusion criteria; however, most of the studies were conducted in Japan (4 studies), China (3 studies) and with only another 8 eligible studies from other Asian nations, and so the evidence does not represent the whole Asian continent. There is no research on Political and Economic environment in relation to obesity in children in Asian countries as compared to the sociocultural and physical environment. Most of the studies (13 of 15) conducted were cross-sectional. In conclusion, we need more studies on environmental factors in relation to the childhood obesity epidemic in Asian children, both from a wider geographical area in Asia, and on more aspects of the obesogenic environment than have been studied to date.

Symposium 5b: Nutrition Potpourri

Weight Regain and Its Associated Factors among Working Women In Selected Public Institutions in Malaysia

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Obesity continues to be a public health concern worldwide. Prevalence of overweight and obesity is on the rise among Malaysians and it has tripled over the period of less than 10 years. The aim of our study is to find out the prevalence of weight regain and its contributing factors among working women who experienced weight loss. A cross-sectional study was conducted among 639 working women in the government sector and in selected areas of Kuala Lumpur vicinity within the one year duration of June 2011 to June 2012. Simple random sampling method was used to select four ministries in Putrajaya vicinity and twenty-five schools in Kuala Lumpur and Bandar Baru Bangi. A self-administered questionnaires (IPAQ, TEFQ, BED and WCQ), anthropometric measurements (weight, height, waist circumference and body fat) were used in this study. Out of these 639 women, 120 women who lost 10% of their lifetime weight were recruited in this study. A total of 85 (70.8%) women had weight loss and regained weight. The majority of women (96.7%) were Malays, of younger adult age (33.2 ± 7.7 years old), married (72.5%) and highly educated (79.2%). Statistical analysis via multiple logistic regression analysis revealed that 40.7% of variability in weight regain could be explained by marital status (OR 0.23; CI 0.06-0.83), overweight and obesity onset (OR 3.7; 95% CI 1.37-9.7) emotional eating (OR 4.5; 95% CI 1.74-12.09), and did not seek professional help (OR 3.7; 95% CI 1.36-10.4). As a conclusion, more than two thirds of the women regained their weight in the past 12 months before the study. Marital status, overweight or obesity onset, emotionally eating behavior and seeking professional support are the main contributing factors to weight regain among women.

The knowledge and practice of balanced diet intake among the rural and fringe Orang Asli women in Peninsular Malaysia

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The objective of this study is to compare the knowledge and practice of balanced diet intake among the rural and fringe Orang Asli (OA) women in Peninsular Malaysia. 1100 Orang Asli women within the reproductive age group of 15-49 years old from the rural and fringe settlements in the state of Pahang, Perak, Kelantan and Selangor were interviewed. Convenient sampling was used in this study. The questionnaire included demographic questions and questions on the knowledge and practice of balanced diet intake. Categorisations of rural and fringe settlements were based on the guidelines by JAKOA (Jabatan Kemajuan Orang Asli). A total of 882 respondents (rural;n=441, fringe; n=441) participated in the study with response rate of 80.2%. The knowledge of protein-based food like meat/chicken for both the fringe and rural respondents were not significantly different (70.5±4.29%, 71.1±4.75%; p=0.881). However, the actual practice of protein-based food like meat/chicken intake was significantly different with the rural respondents take less of protein-based food on daily basis as compared to the fringe respondents (31.1±4.41%,62±4.41%; p<0.001). The knowledge of fruit as part of balanced diet for both fringe and rural respondents were respectively at 73.5±4.15% and 62.7±4.6%, p=0.01. The practice of fruit intake on daily basis in rural was significantly lower as compared to fringe group (25.9±4.09%, 42.4±4.65%, p<0.001). Even though both groups of knowledge levels are similar, less rural respondents take meat/chicken and fruits as compared to the fringe respondents. This might be due to scarcity of both food groups at the rural setting. Lack of financial leadsto lower consumption of these food as they can be considered as quite pricey especially in the interior/remote setting. The food source pattern for the rural community is changing as they are now less dependent on hunting and they sell agricultural produce e.g. banana to purchase rice for consumption.

Development and validation of pregnancy physical activity likelihood assessment based on health belief model among pregnant women in Kuala Terengganu, Terengganu

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Practicing physical activity while pregnant has many significant health benefits and safe for both mothers and infants. However, it is often addressed as unsafe by most pregnant women. The Health Belief Model is generally used for examining or explaining health-related behaviors. This study aimed to assess likelihood to do physical activity among pregnant women based on Health Belief Model. A cross-sectional study was conducted

among 250 pregnant women attending governmental health clinics in Kuala Terengganu. A literature search was conducted to provide an initial basis in selecting the items. Content validity was assessed by expert panels and face validity was done by six pregnant women in health clinics. The questionnaire composed of 50 items and six subscales (Susceptibility, Severity, Benefits, Barriers, Self-efficacy and Cues to Action). Construct validity and internal consistency were examined. Construct validity was estimated by using exploratory factor analysis and principal axis factoring with promax rotation was applied to extract the factors. The acceptable factor loading of >0.40 was considered in extraction. The analysis was subsequently repeated to remove any inappropriate items. The final extraction omitted 24 items and leaves the final questionnaire with 26 items and six factors. Each factor was labeled to describe the item loadings on it; Factor 1 (Perceived Benefits=7 items), Factor 2 (Cues to Action=6 items), Factor 3 (Perceived Barriers=5 items), Factor 4 (Perceived Severity=3 items), Factor 5 (Perceived Susceptibility=3 items) and Factor 6 (Self-efficacy=2 items). The factor loadings ranged from 0.425 to 0.856. The internal consistency was evaluated using Cronbach's Alpha, and it was acceptable for the final 26-items (CA=0.826) and for each factors; Benefits (CA=0.833), Cues to Action (CA=0.854), Barriers (CA=0.732), Severity (CA=0.769), Susceptibility (CA=0.798) and Self-efficacy (CA=0.646). In conclusion, this pregnancy physical activity likelihood questionnaire based on Health Belief Model is valid and reliable. It can be a useful tool in evaluating physical activity particularly among pregnant women in Malaysia.

Have we failed to impart good nutrition during pregnancy and lactation to our mothers based on evidence of a high prevalence of postpartum practice of food beliefs?

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Postpartum care is crucial to facilitate the physical recovery of mothers, to prevent chronic illness and also strengthen the intra-family relationships. In Malaysia, the three major ethnic groups Malay, Chinese and Indian have their own postpartum practices. One of the most important aspects of postpartum beliefs and practices is the adherence to food restrictions. The objective of this paper is to determine the practice of food beliefs and nutritional status among postnatal women attending health clinic in Seremban in 2005. A descriptive cross-sectional study was conducted in health clinic, Desa Sikamat, Seremban. A total of 75 postpartum women aged between 18-45 years were recruited in this study. Participants who have presence of any diseases were excluded from the study. Data collection was conducted from January to March 2015 via subject information sheet, 24 hour dietary recalls and questionnaires which consist of the socio-demographic data and practice of food beliefs. All statistical analyses were conducted using SPSS version 18.0. Descriptive statistic and chi-square test were used in the study. Probability level of $p < 0.05$ was considered significant. The prevalence of postpartum women practicing food beliefs was 80%. This study revealed that the factors affecting the practice of food beliefs were family pressure (20%), family tradition (29.3%), self-belief (26.7%) and influences from postnatal caretaker (4.0%). The most prohibited foods were fruits and vegetables where more than 90% of the postpartum women were avoiding them as the properties are considered 'cold'. The top prohibited lists of vegetables were watercress (kangkung), bean sprouts, cucumber, brinjal and pumpkin whereby majority (80%) of the mothers was avoiding them. The mean energy intake was 1586 ± 354 kcal which is 64.0 - 78.5% of RNIM. The mean protein intake was 64 ± 18 g which was 90.8% of RNIM. And the mean intake of dietary fiber was 5 ± 4 g which was 26.3% of RNI. Mean calcium intake was only 38.8% of RNIM. Only mean iron intake was 134.6% of RNI at 15% iron bioavailability since majority eat meats and chicken. The BMI status of the postpartum women were mainly overweight (45.4%) and obese (28.0%) where the rest were underweight (9.3%) and

normal weight (17.3%). In this population there was no significant association between BMI, and the practice of food beliefs. This could be due to the fact that they have not lost their antenatal weight. The mean energy intake was below that required by RNIM probably due to the practice of (pantang) and food restrictions during postpartum. The conclusion is that the practice of food beliefs is still prevalent in this modern era and a culture sensitive nutrition education is required to correct this ingrained cultural practice to ensure good nutrition among postnatal mothers in Malaysia.

Compliance to WHO recommended complementary feeding practices in Sumedang, West Java, Indonesia

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The first 1000 days of life from conception to 24 months of age is a period of rapid physical, cognitive and social development that requires optimal nutrition. To attain this, international infant and young child feeding (IYCF) practice recommendations include exclusive breastfeeding (BF) up to six months followed by appropriate complementary feeding and continued BF to 24 months or beyond. Nationally, Indonesia has promoted exclusive BF, however complementary feeding practices vary, depending on local policy. In this longitudinal study we assessed feeding practices of mothers in Sumedang, West Java, Indonesia using the WHO IYCF indicators. A convenience sample of healthy infants (n=154) with a history of exclusive/predominant breastfeeding to at least 4 months of age were recruited at aged 6 months (27.6 ± 1.2 weeks). Weight and length were measured at aged 6 and 9 months, and socio-demographic, health, morbidity status and complementary feeding practices were collected by an interviewer-administered questionnaire. Among infants at 6 and 9 months of age the prevalence of stunting (HAZ<-2) was 14.5% and 18.8%, respectively, whereas wasting (WHZ<-2) was 4.4% and 5.1%, respectively. At 6 months, 99.4% of infants had received solid, semi-solid or soft foods and 70.1% had achieved the minimum meal frequency (MMF) (≥ 2 meals/d), however only 5.2% and 3.9% had achieved minimum diverse diets (MDD) (≥ 4 food groups) and minimum acceptable diets (MAD) (meeting both MDD and MMF), respectively. By 9 months, compliance to MDD and MAD indicators had increased dramatically to 66.2% and 32.5%, respectively, although adherence to the MMF indicator had fallen to 41.6%. Despite improvements in complementary feeding practices among infants at 9 months, IYCF practices were poorer compared to nationally representative data. These findings suggest the need for interventions and monitoring aimed at improving child feeding practices and nutritional status. Research support was provided by Meat & Livestock Australia.

Advocating healthy eating through smartphone application – MyNutriDiari

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The prevalence of obesity amongst adults in Malaysia has increased dramatically from 4.4% in 1996 to 14.0% in 2006, and has increased slightly to 15.1% in 2011. One of the main contributors to obesity is unhealthy eating habits. Therefore various strategies had been implemented by Ministry of Health Malaysia to promote and inculcate healthy eating habits of Malaysians. A smartphone application namely MyNutriDiari is the most recent strategy being used to advocate healthy eating particularly in creating a calorie conscious

community. Users can use various functions of MyNutriDiari such as Food Diary and Barcode Scanning. The application also enables users to monitor calorie intake and body weight daily, weekly, monthly and yearly. It is hoped that MyNutriDiary will be used widely in Malaysia and help Malaysians to practice healthy eating and be a healthier nation.

Health benefits and potential risks related to the intake of omega-3 fatty acids and mercury from consumption of marine food in Malaysia

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The nutritional benefits of fish consumption especially omega-3 polyunsaturated fatty acids (PUFAs), may protect against several adverse health effects, including coronary heart disease mortality, and stroke. However, some concerns about potential health risks derived from the environmental contaminants (total mercury) found in fish have been also raised. Therefore, balancing adequately the risks and benefits of fish consumption is currently a nutritional/environmental health key issue. In the present study, edible portion of 45 species of marine organisms (N=394) were analyzed for the concentrations of total mercury. The concentrations of omega-3 fatty acids in fish from Malaysian market were obtained from published literature search. Average meals of fish consumption were obtained from results of food dietary survey (three days record) conducted among 3,500 subjects in Peninsular Malaysia. Daily intakes of alpha-linolenic acid (ALA), eicosapentaenoic acid (EPA), docosahexaenoic acid (DHA), and total mercury were specifically determined for standard adults of 70 kg and compared with the Provisional tolerable Daily Intake (PTWI) of the total mercury (5 µg/kg BW). Moon fish were the species showing the highest content of ALA (1,046.8mg/100g) while Long tail shad (2,041.8mg/100g) was for EPA and Yellow stripe scads (782.05 mg/100g) was for DHA. The highest intake per serving per day for omega-3 fatty acids (ALA+EPA+DHA) from fish consumption in descending order is: Moon fish (1318.1 mg/day), Six bar grouper (1258.49 mg/day), Long tail shad (1059.96 mg/day), Mangrove red snapper (572.53 mg/day) and Yellow stripe scads (561.03 mg/day). The highest weekly total mercury intake were through consumption of Moon fish (2.71 µg/kg BW), Mangrove red snapper (2 µg/kg BW) and Yellow stripe scads (1.92 µg/kg BW). The least Maximum Safe Weekly Consumption (MWSC) amount is for Yellow stripe scads (0.84), where it would be necessary to eat at least 0.84 kg/week of this fish to reach the PTWI. These results indicated that there is no significant danger to human from consuming fish from Malaysian market. The fish species, frequency of consumption, and the meal size are among essential factors for balancing the health benefits and risks of regular fish consumption.

Poster Presentations: Day 1 (Group A, E and F)

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

A01 Assessment of physical activity and abdominal obesity among elderly in pondok institutions, kelantan: the preliminary findings

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Abdominal obesity and physical inactivity in elderly are linked with greater mortality risk. For elderly, it is essential for them to improve their physical activity level toward a better health. This cross sectional study aimed to find the association between abdominal obesity and physical activity level among elderly in Pondok Institutions, Kelantan. Fifty respondents (5 males and 45 females) of ambulatory Malaysian elderly aged 60 years old and above in Pondok Institutions, Kelantan were selected using convenient sampling method. Respondents were interviewed for their physical activity level using International Physical Activity Questionnaire (IPAQ) short form, and Mini Nutritional Assessment (MNA) to assess their nutritional status. Weight, height, and waist circumference were measured to calculate Body Mass Index (BMI) and abdominal obesity. Based on BMI classification, the respondents were categorized into underweight (8%), normal weight (26%), overweight at risk (14%), obese I (42%), and obese II (10%). From IPAQ short version, the respondents are classified into two; Inactive Category I (46%) and Minimally active Category II (54%). MNA result showed that 46% of them have normal nutritional status, 50% were at risk of malnutrition, and 4% were malnourished. Waist circumference measurement found that there was no male (0%) with abdominal obesity while among 45 females respondent, 11 of them (24.44%) were having abdominal obesity. A significant linear relationship were found between physical activity level with $r=0.382$ ($p<0.05$) and nutritional status $r=0.372$ ($p<0.05$) with abdominal obesity. There was no significant association between physical activity level and nutritional status where $r=0.165$, $p>0.05$. In conclusion, abdominal obesity and physical activity level among elderly in Pondok Institutions, Kelantan do have significant association.

A02 Assessment of hydration status and hydration practices among male club cyclists

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Cycling under a hot and humid environment can develop chronic dehydration and it can predispose athletes to heat-related disorders and performance decrements. In order to have upmost physical and mental performance, it is important to maintain optimal hydration status. The aim of this study is to assess the hydration status and hydration practices among club cyclists. A total of 101 club cyclists who cycle in Klang Valley participated in this study. Anthropometric measurements of height and pre- and post- cycling weight were measured. Urine samples of pre- and post- cycling were collected to determine subject's hydration status through urine colour and urine specific gravity. Lastly, a self-administered

questionnaire containing 8 questions was given to investigate hydration practices. Based on the findings, there were significant changes in weight, urine colour score and urine specific gravity pre- and post- cycling ($P < 0.001$). Besides, there was a strong association of hydration status assessment determined between urine colour chart and urine specific gravity for pre- ($P < 0.01$, $r = 0.765$) and post- ($P < 0.01$, $r = 0.769$) cycling respectively. Most of the cyclists preferred water (42.57%) and sports drink (41.58%) as a source of rehydration and water (62.38%) was their preference while they were cycling. Majority of the cyclists carried their own fluid along (98.02%) during cycling and drank when they felt thirsty (51.49%). Most of the cyclists consumed below 200ml (45.5%) of fluid before cycling, 501ml to 1000ml (43.6%) during cycling and below 500ml (64.4%) after cycling. Their hydration practices were heavily influenced by friends or other cyclists (3.64 ± 1.26). In conclusion, adhering to proper hydration practice is important and it may help cyclists to reduce adverse effects and maintain optimal performance during endurance exercise.

A03 Daily physical activity, mode of travel, and screen-based sedentary behavior and their associations with cognitive function in adolescents

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There has been conflicting evidence regarding the influence of physically inactive lifestyles on adolescents' cognition. This study was undertaken to investigate the associations between daily physical activity, mode of travel, and screen-based sedentary behaviour with cognitive function among adolescents. A total of 295 Malay adolescents aged 10 to 14 years were recruited from primary and secondary schools in Kuala Lumpur using multistage sampling method. A validated self-reported physical activity questionnaire (PAQ) was used to assess daily physical activity level, as well as to obtain information on mode of transport to and from school, and amount of time spent on screen-based sedentary activities, including television viewing, playing video games and computer usage. Four subtests of the Wechsler Intelligence Scale for Children (WISC-IV^{UK}) were selected to assess visuospatial ability, memory, processing speed and reasoning ability. In the current analyses, only 231 subjects (120 boys; 111 girls) with valid data for screen-based activities were included. Some 28.1% adolescents had low physical activity level based on PAQ scores; and 60.1% were passive commuters to school. The majority (82.7%) exceeded the recommended two-hour daily screen time limit. No significant association was found between mode of travel and cognitive measures after adjusting for sex and other potential confounders. However, moderate-to-high levels of daily physical activity were found to be specifically associated with better memory ($\beta = 0.155$, $p = 0.034$) and processing speed ($\beta = 0.181$, $p = 0.009$). Similarly, screen time was positively associated with memory ($\beta = 0.160$, $p = 0.024$), but not with other cognitive domains. These findings highlight that moderate-to-high levels of daily physical activity and engagement in screen-based sedentary activities, but not active commuting to school, may lead to enhancement of selective aspects of cognitive function in adolescents. Further studies are warranted to explore the influences of different types of physical activity and the content of screen-based activities on cognition.

A04 Determination of obesity, physical activity and body fat percentage among women textile traders in Central Market Siti Khadijah and Bazaar Buluh Kubu, Kota Bharu, Kelantan

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Assessment of nutritional status and body fat percentage was carried out on 182 women textile traders in Central Market Siti Khadijah and Bazaar Buluh Kubu, Kota Bharu, Kelantan. Data was collected using a questionnaire which included socio-demographic characteristics, the International Physical Activity Questionnaire (IPAQ), 24 hour dietary recall and Food Frequency Questionnaire (FFQ). Body mass index (BMI), waist circumference and waist-hip-ratio were measured using standardized methods. The mean age of the respondents was 33.5 ± 12.5 years. The majority of the respondents were Malay (98.4 %) with 1.1% being Chinese and 0.5% other races. The mean weight, height and BMI were 57.8 ± 13.1 kg, 1.55 ± 0 m, 24.2 ± 5.2 kg/m² respectively. Based on WHO classification, 25.3% and 13.7% were overweight and obese respectively. Using waist circumference, waist-to-hip ratio and body fat percentage, prevalence of obesity were 42.9%, 24.2% and 42.9% respectively. A total of 19.2% of respondents had low physical activity level, while 71.4% and 9.3% were in the moderate and high physical activity categories. Out of the respondents, 89.6% of them consumed cooked rice at least once daily (one plate per day), other food items consumed daily were marine fish (one medium fish per day), green leafy vegetables ($\frac{3}{4}$ cup per day), and chicken (one medium per day). The mean calorie intake of respondents was 1063 ± 324.4 kcal, with 18.0% from protein, 26.0% from fat and 56.0% from carbohydrate. An association was found between age ($\chi^2 = 22.6$, $p < 0.05$), marital status ($\chi^2 = 20.64$, $p < 0.05$), number of children ($\chi^2 = 17.27$, $p < 0.05$) with obesity. However, educational level ($\chi^2 = 2.27$, $p > 0.05$), individual income ($\chi^2 = 4.92$, $p > 0.05$), and health status ($\chi^2 = 2.98$, $p > 0.05$) was not associated with obesity. In this sample of women textile traders, socio-demographic were found to have an association with nutritional status of the respondents.

A05 Eating behavior, nutritional status, and physical activity assessment among student from faculty of food science and technology in UPM

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Poor eating behaviour is a major health concern among young adults who experienced transition into university life which determines the physical wellbeing. This study adapted the cross sectional study design and convenience sampling method in order to assess the association of eating behaviour and nutritional status among the students from the Faculty of Food Science and Technology in University Putra Malaysia (UPM). A total of 205 participants (17.1 male and 82.9% female) with age the mean (SD) of 21.49 (1.23) years old participated in this study. Anthropometric measurements of participants were taken and a set of self-administered questionnaires (food frequency questionnaire, Three-Factor Eating Questionnaire-R18 and International Physical Activity Questionnaire) were used. Overall, majority of male (45.70%) and female (34.70%) respondents were found to have uncontrolled eating behaviour. More female respondents (32.4%) were found to have cognitive restraint whereas more male respondents (28.6%) have emotional eating behaviour. There were significant relationship found between body fat percentage (BF%) and cognitive restraint (CR) eating behaviour ($r = 0.173$, $p < 0.01$) and emotional eating ($r = 0.214$, $p < 0.01$). BMI will significantly increase when uncontrolled eating (UE) ($r = 0.142$,

$p < 0.01$) and emotional eating (EE) ($r = 0.155$, $p < 0.01$) habits increase. As for physical activity level, male respondents were significantly more active compared to female respondents ($p < 0.01$). The respective authorities from universities should provide an effective setting to implement education by conveying proper nutrition information, importance on physical activity and practise positive eating behaviour.

A06 Relationship between socio-demographic status, disordered eating behaviour, physical activity level and body weight status with Health Related Quality of Life (HRQOL) among adolescents in Sepang, Selangor

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This cross-sectional study determined the predictors of Health Related Quality of Life (HRQOL) among 389 adolescents in Sepang, Selangor. Weight, height and waist circumference were measured and BMI was calculated. Disordered eating behaviour, physical activity level and HRQOL were assessed using Eating Attitude Test (EAT-26), Physical Activity Questionnaire for Adolescents (PAQ-A) and Pediatric Quality of Life Inventory™ (PedsQL) respectively. Around 56.8% of the respondents were Malay, 23.7% Indian, 15.2% Chinese and 4.4% Indigenous people. There were 27% overweight and obese and 7.4% thin and severely thin respondents. The prevalence of abdominal obesity disordered eating and low physical activity were 20.3%, 30.6%, and 41.4% respectively. The mean HRQOL was 70 ± 18.36 with males scoring higher (73 ± 19.32) than females (68 ± 17.31). The lowest score of the four domains in HRQOL among males was school functioning while emotional functioning was the lowest among females. The highest domain score was in social functioning for both males and females. Sex ($t = 2.415$, $p < 0.05$), ethnicity ($t = 4.416$, $p < 0.05$), educational level of parents (mother: $F = 2.319$, $p < 0.05$; father: $F = 2.595$; $p < 0.05$), household income ($r = 0.104$, $p < 0.05$), disordered eating behaviour ($r = -0.224$, $p < 0.0001$), BMI-for-age ($r = -0.109$, $p < 0.05$) and waist circumference ($r = -0.114$, $p < 0.05$) were found to be associated with HRQOL. Multiple linear regression analysis showed one factor, disordered eating behaviour, to be a predictor of HRQOL, explaining 5.0% of the variance. Intervention programs should emphasize on disordered eating behaviours of these adolescents to improve their HRQOL.

A07 Validity and reliability of the food frequency questionnaire (FFQ) for primary school children in Malaysia

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Designing a food frequency questionnaire (FFQ) for a specific target population is particularly important in order to increase the accuracy and precision of the estimated nutrients intake. To date, there is limited information pertaining to the validity and reproducibility of the FFQ method used among children in Malaysia. A cross-sectional study using multi-stage stratified sampling method was conducted to determine the reliability and validity of a modified FFQ for primary school children in Ampang, Selangor. A total of 222 children aged 10-11 years old participated in this study. The FFQ consist of 104 food items and was tested on the convergent validity by correlating it with a two days 24-hour dietary recall.

The reliability of the FFQ was tested by using test-retest and internal consistency. The median energy intake for the FFQ was reported to be 1549.9kcal per day while the median energy intake for the two day 24-hour dietary recall was 1635.4kcal per day. Spearman correlation coefficient for the energy intake between the two methods was reported to be weak ($r_s=0.234$; $p<0.05$). For the test-retest reliability, the spearman correlation coefficient of energy intake between the two FFQ was reported to be moderate ($r_s=0.572$; $p<0.05$). As of for the internal consistency reliability, the Cronbach's alpha reliability coefficient was reported to be very good (Cronbach's $\alpha=0.944$). The Bland-Altman plot for energy intake was concentrated in the y-axis range (+1451.78kcal to -1450.91kcal) with the difference of 44.57kcal. This concludes that the modified FFQ is a relatively good and valid tool in assessing the habitual energy intake of primary school children in Ampang, Selangor.

A08 Factors associated with total satisfaction with food-related life among elderly in Rumah Seri Kenangan, Selangor

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There are various factors that may alter elderly relationship with food as they get older and eventually their satisfaction with food-related life (SWFL). A cross-sectional study was conducted to determine the associations between SWFL and socio-demographic factors, dietary intake, food access and malnutrition risk among elderly in Rumah Seri Kenangan. Socio-demographic, Mini- Nutritional Assessment (MNA), Experiences of food access (Naithani et al., 2009) and SWFL (Grunert et al., 2007) were assessed using sets of questionnaires. Dietary intake and anthropometric measurements were assessed using forms. All statistical analysis was performed using IBM SPSS version 21. A total of 57 elderly were participated in this study where 47% of them were male and 53% were female. 40.4% of the subjects were at risk of malnutrition and 12.3% was malnourished. Male subjects consumed significantly higher in total calorie, protein and carbohydrate intake than female ($p=0.008$, 0.034, 0.007 respectively). Well-nourished subjects consumed significant higher total calorie intake followed by at risk of malnutrition and lastly malnourished subjects ($p=0.048$). Experience with food access showed that malnourished subjects had greater difficulty with hunger domain of food access ($p=0.824$) and had the lowest SWFL mean score ($p=0.756$). However, socio-demographic backgrounds, dietary intake, risk of malnutrition and food access were not associated with total SWFL. In conclusion, malnourished subjects experienced difficulties in hunger domain and lesser satisfied with their food-related life than well-nourished and at risk subjects. Thus, improvement in the nutritional status can be achieved by providing adequate nutrition and enhancing food availability and accessibility to elderly in care homes.

A09 Does screen time affect the energy intake, sleep quality and physical activity levels?

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Today's generation is technology driven leading to a higher dependency on the digital devices. This exposes them to a higher screen time resulting in a paradigm shift in eating habits. There is a preference of energy dense and convenience foods, along with a decline in the initiation and motivation of exercise. Sleep has also been traded off to accommodate the busy work schedule and social demand. The objective of this study was to determine the association between screen time usage and energy intake, sleep quality

and physical activity among university students. Time spent on screens was recorded on a self-administered questionnaire; the energy intake was determined using 2 days 24 hour diet recall. Sleep quality and physical activity were measured using the Pittsburgh Sleep Quality Index (PSQI) and short-form International Physical Activity Questionnaire (IPAQ), respectively. A total of one hundred university students completed the study. Median was used to describe the overall screen time spent by the students and reported as 6.5 hours (4.0). The results showed a significant negative association between screen time usage and sleep quality ($p < 0.05$). However, the relationship between screen time usage and energy intake and physical activity was not significant ($p > 0.05$). It suggests that higher time spent on screens was related with poorer sleep quality, but no association was found between screen time usage and the other two studied variables (energy intake and physical activity). Thus, preventive strategies against poor sleep quality in university students may need to target on using screens moderately.

A10 Development of the Malaysian active healthy kid's report card on physical activity for children – a tool for management of obesity in Malaysian children

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Obesity has become the major health concern in children over the past few years with physical inactivity as a powerful contributor. The Malaysian Active Healthy Kids Report Card has been modeled on the Canadian Report with the aim of providing evidence-informed communication and advocacy tool to promote physical activity of Malaysian children aged 6 to 18 years. Online databases, national surveys and government documents were searched for relevant studies examining physical activity and ten other indicators (organized sports and physical activity participation, active play, active transportation, sedentary behaviours, school, physical education and physical activity participation, family and peers, community and the built environment, government strategies and diet). 3 studies (SEANUT Survey, Global School-health Survey 2012, ministry report) met the inclusion criteria and were included in the report card. The data were reviewed and letter grades (A, B, C, D, F) were assigned by a group of content experts from across Malaysia. The physical activity and active transportation indicator received a “D” while family and peers and government strategies received the grade “B”. For school, the data were reviewed and was assigned a “C” grade while other indicators were given “INC” due to inadequate or unavailable current Malaysian data. The grades assigned show the current state of nation for physical activity and health among Malaysian children. Through the report card, it is highlighted where more research is needed to better understand physical activity behaviours of Malaysian children with the hope of increasing physical activity participation among the children.

A11 Body weight and eating behaviour of Nigerian postgraduate students in UniSZA, Malaysia

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University is a critical period where unhealthy change in eating behaviour develops, notably among international students. Therefore, the aim for this study is to investigate the change in body weight and eating behaviour of Nigerian postgraduate students in Universiti

Sultan Zainal Abidin (UniSZA), Malaysia. It was hypothesized that, after six months living in Malaysia, the body weight and eating behaviour will not change. A total of 108 students completed a set of self administered questionnaire, and their weight and height was measured on arrival in Malaysia and after six months of stay. Descriptive statistic and paired t-test was carried out to analyze the data (SPSS Version 20). The study shows that, body weight was statistically increased by $2.3 \pm 0.5\text{kg}$. Intake of fat ($p=0.006$), sodium ($p=0.012$) and iron ($p<0.001$) was significantly reduced, while intake of vitamin c increased ($p=0.004$) after six months. There is also a decline in the frequency of having breakfast, lunch, dinner every day. Intake of fruits and vegetables everyday was also reduced. Meal skipping frequency has slightly increased, with breakfast as the most frequent skipped meal compared at the time of arrival in Malaysia. . As a conclusion, the students might have gained weight by changing their eating behaviors due to the new environment in Malaysia. There is a need to develop awareness program on nutrition that could encourage and promote healthier eating behavior and lifestyle in adapting new environment for international students.

A12 The association between body mass index (BMI) and diet plan among women in Baghdad City, Iraq

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Nowadays, Obesity, especially among women is on the rise. More and more women are trying different types of diet to lose or control their body weight. The aim of this study was to determine respondents Body Mass Index (BMI) and its relation with diet types. A cross-sectional study was conducted among 508 adult women living in Baghdad city, Iraq. Weight and height were measured to determine their BMI and then classified into four groups, which are underweight, normal, overweight and obese. A self-administered questionnaire was used to ask about diet and exercise history. The data were collected during November 2014. The results showed that mean age was 37.7 ± 11.7 years old. Regarding the body weight status, only (31.3%) had normal body weight, while (36.8%) were overweight and (29.7%) were obese. A total of (41.5%) said they try diet last year and (56.9%) took their diet from the internet, while only 23.7% went to a specialized nutritionist. The majority of the respondents (79.1%) did not perform any exercise or physical activity. The mean for times of eating outside the house was 1.06 ± 1.37 per week. The association between BMI and having diet, type of diet was significant while, the association between performing exercise regularly and BMI was not significant. As a conclusion, the weight status of women living in Baghdad city is not healthy as more than two-thirds are either overweight or obese. More attention should be given to women as most of them in childbearing age and this will affect their pregnancy and child health in the future.

A13 A comparison of physical activity level assessed by who stepwise physical activity questionnaire, 3-day physical activity record and accelerometer

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The objective of this study was to compare the physical activity level assessed using the WHO Stepwise Physical Activity Questionnaire (WHO SPAQ), a 3-Day Physical Activity Record (3DPAR), and the Lifecorder Accelerometer on a sample of employees recruited from Universiti Putra Malaysia. Over five consecutive days, 47 employees (15 men, 32 women)

wore an accelerometer, completed a 3-day physical activity record and the WHO SPAQ to assess their physical activity level. The mean age of respondents was 33.32 ± 11.82 years. Based on the WHO SPAQ assessment, 44.7% of respondents were categorized as vigorously active, 38.3% as moderately active, and 17.0% as sedentary. In contrast, the 3DPAR results have shown a majority (53.2%) of respondents categorized as moderately active, 34.0% were vigorously active, and 12.8% were sedentary. The classification of physical activity levels measured by accelerometer showed that more than half of respondents (66.0%) were categorized as moderately active, 17.0% were sedentary, and 17.0% were vigorously active. There was no significant association between the two questionnaire-derived instruments ($\chi^2=4.206$, $p=0.379$). The MET score of WHO SPAQ was not significantly correlated with the physical activity level assessed by 3DPAR ($r=0.087$, $p=0.561$), and the physical activity level assessed by WHO SPAQ was not associated significantly with the accelerometer ($\chi^2=3.467$, $p=0.483$). The 3DPAR does not significantly associate with the accelerometer in terms of physical activity level ($\chi^2=5.842$, $p=0.211$). These findings require further investigation with a larger population to confirm this comparison among instruments studied.

A14 School canteen food purchasing practices and nutritional status of primary school students in Kelantan

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The objectives of this study were to investigate primary school students' food purchasing practices and the relation with their nutritional status. This was a cross-sectional study that had been conducted in 3 randomly selected primary schools of 3 different districts: Kota Baharu, Tumpat and Pasir Puteh. 281 students in standard 3 to 5 were chosen randomly and they had to answer a set of questionnaire regarding their socio-demographic data and canteen food purchasing practices. They were guided by the researchers while answering the questionnaire. Body height and weight of the participants were measured after they had answered the questionnaire. Results showed 98 participants (34.9%) were underweight and 53 participants (18.9%) were overweight or obese. This study found almost 99% of the participants purchased foods from school canteen every day and the 7 most commonly purchased items in descending order were fish cracker, curry chicken rice, spicy chicken rice, confectionery, porridge, Milo or tea and syrup. There was a significant association between the frequency of purchasing fish cracker ($\chi^2=13.672$, p value=0.001) and spicy chicken rice ($\chi^2=9.089$, p value=0.011) with parental salary. Furthermore, these two types of foods also significantly associated with parental job category (fish cracker: $\chi^2=9.667$, $p=0.022$; spicy chicken rice: $\chi^2=13.098$, $p=0.004$). There is no significant association between the frequencies of purchasing foods with BMI status. Each participant spent around RM2.90 daily (SD=1.4) for canteen foods. Parental salary and job category seemed to be the factors that influenced participants' food purchasing practices in the school canteen. In conclusion, food sold in school canteen may influence the nutritional status of the students. Teachers and canteen vendor should take responsibilities to educate the students about healthy purchasing behavior and prepare healthy foods in school canteen.

A15 Factors associated with 6 months postpartum weight retention among mothers in Seremban, Negeri Sembilan

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Postpartum weight retention contributes to obesity in women of reproductive age. This cross-sectional study was conducted to determine factors associated with 6 months

postpartum weight retention among mothers in Seremban, Negeri Sembilan. An interviewer-administered questionnaire was used in data collection which consisted of demographic and socio-economic status, breastfeeding practices, 24 hour diet recall, International Physical Activity Questionnaire (IPAQ) and Edinburgh Postnatal Depression Scale (EPDS). Pre-pregnancy body mass index and gestational weight gain were obtained from medical records. Women were measured for body weight (kg) and height (m). A total of 83 women aged 20 to 44 years participated in the study with a majority were Malays (81.9%). Mean gestational weight gain was 11.7kg with 30.1% and 27.7% of women gained insufficient and excessive gestational weight gain, respectively. Mean weight retention at 6 months postpartum was 2.53kg and the proportion of women with high weight retention (≥ 4.55 kg) was 32.5%. The percentage of women without depression, practiced complementary feeding and with high level of physical activity were 86.7%, 51.8% and 45.8%, respectively. Lower maternal education ($p < 0.05$) and pre-pregnancy body mass index ($p < 0.05$) and higher gestational weight gain ($p < 0.005$) were significantly associated with postpartum weight retention. Understanding factors associated with postpartum weight retention can contribute to effective strategy to prevent obesity and its associated consequences in women.

A16 Assessment of nutritional status among schoolchildren: Validity of self-reported weight and height

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Self-reported height and weight is commonly used in lieu of objective measurement in online, telephone, mail as well as large epidemiological surveys. However, self-reported height and weight are subject to inaccuracy particularly among adolescents and its validity needs to be verified as misreporting of height and weight could lead to misclassification of body mass index. The objective of this study was to determine the validity of self-reported weight and height among Malaysian secondary schoolchildren. Self-reported and measured weight and height from a subgroup of 663 apparently healthy schoolchildren from the Malaysian Adolescent Health Risk Behaviour (MyAHRB) survey 2013/2014 were analysed. MyAHRB is a cross-sectional, school-based and nationwide survey which was conducted from May to September 2013 to determine the health risk behaviour among secondary school children aged 13-18 years in Malaysia. Respondents were required to report their current body weight and height via a self-administrative questionnaire before measured by examiners. The validity of self-reported against examiner-measured weight and height was examined using Intraclass Correlation Coefficient (ICC), Bland-Altman plot and weighted Kappa statistics. There was a significant high ICC between self-reported and measured weight (0.96, $p < 0.001$) and height ($r = 0.94$, $p < 0.001$). The Bland-Altman plots indicated that there were small mean differences (-1.6 kg for weight, -1.2cm for height and -0.36 kg/m² for BMI) between self-report and measured method. The weighted Kappa statistics analysis showed that there was a substantial agreement between BMI status calculated from self-reported and measured weight and height ($\kappa = 0.76$, 95% CI: 0.67, 0.84). The methods of self-reported weight and height can be used for assessing the nutritional status of Malaysian schoolchildren in epidemiological survey.

A17 Factors related to food insecurity among adult homeless in Kuala Lumpur

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Food insecurity occurs when someone has insufficient physical and economic access, does not consume safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life. The homeless is one of the disadvantaged groups that can relate to food insecurity. The aim of this study is to examine the factors related to food insecurity among adult homeless at the city center of Kuala Lumpur. This is a cross-sectional study using convenient sampling. Face-to-face interviews were conducted among Malaysian adult homeless aged 20 to 75 years old who are currently homeless for at least a week. The questionnaire consists six parts with 30 questions including socio-demography, institutional engagement, social ties, homeless experience, individual deficits and food security status using the U.S Adult Food Security Survey Module. A total of 129 respondents, which consists of 86% male and 14% female, aged between 21-71 years old, have completed the questionnaires. The food insecurity prevalence was 69% with an average of 2.89 ± 4.80 years of homelessness. There was significant differences between doing odd job ($p < 0.05$) and food security status among respondents. Adult homeless who reportedly have higher income are negatively associated with food insecurity ($r = -0.215$, $p < 0.05$). In conclusion, food insecurity among homeless associated with not doing odd job and lower income. Thus, further investigation is needed to more deeply study the factors related to food insecurity among homeless people in Malaysia.

A18 School food environment in relation to nutritional status of secondary school students

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The school is an important setting to encourage lifelong healthy dietary habits among students. A school-based cross-sectional study was conducted to determine the relationship between the school environment and the adolescent's nutritional status. The ANGELO framework was adapted to study the school environment where the environmental setting was the school food environment while the factors considered for setting were physical, political, economic and socio-cultural. Students ($n = 270$) from Form 1 to 5 in six school secondary schools in Port Dickson were recruited for the study. Anthropometric measurements were taken directly for calculating body mass index and waist circumference. Data on the school environment were collected through School Management Questionnaire, interviewer-administered questionnaire an audit instrument. Based on BMI, 13.9% and 8.3% overweight and obese students respectively while 10.7% students were abdominally obese. The audit of school environment showed that the schools provided various foods and beverages for the students. There was a significant negative correlation between waist circumference and the school management practices to improve the physical environmental factors ($r = -0.139$, $p < 0.05$), socio-cultural environmental factors ($r = -0.176$, $p < 0.01$) and overall food environment ($r = -0.171$, $p < 0.01$). Besides that, school management practices on the physical factors of school food environment is found to be significantly correlated with student's healthier BMI ($r = -0.108$, $p < 0.05$). In conclusion, school is a potential setting for influencing the students' dietary behaviour, which consequently influences the student's nutritional status. Future studies should include individual, family and neighbourhood environmental factors besides school environmental factors to have a broader understanding of environmental factors to obtain in-depth understanding of environmental factors affecting the nutritional status of adolescents.

A19 Nutritional status and cholesterol level among staffs in the Health Campus, Universiti Sains Malaysia

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The objective of this study was to determine the nutritional status and cholesterol level among support staffs in the Health Campus, Universiti Sains Malaysia. Assessment of height (SECA-206), weight (SECA-762) and blood cholesterol level (CardioChek P.A.) were done to each respondent. Convenience sampling methods was used for sample selection and 100 staffs (40 males and 60 females) whom age ranged from 23 to 59 years old, agreed to get involved in this study. Mean body weight for male and female were 74.2±11.8 kg and 60.6±11.6 kg, respectively. Mean body height for male and female were 167.9±5.9 cm and 155.2±5.8 cm, respectively. Mean BMI for male and female were 26.4±4.5 kg/m² and 25.1±4.5 kg/m², respectively. Based on the Body Mass Index (BMI) classification, 3% of the respondents were underweight, 42% of respondents were at desired BMI, 36% of the respondents were overweight and 19% of the respondents were obese. On the other hand, the ranged of blood cholesterol level ranged from 3.01mmol/L to 9.49mmol/L. Mean blood cholesterol level of male and female were 5.3±1.2mmol/L and 5.2±1.0mmol/L, respectively. A total of 50.0% of male respondents and 51.7% female respondents were in healthy range of blood cholesterol level meanwhile there were 50.0% and 48.3% of male and female respondents had slightly risk or high risk blood cholesterol level. There was a significant association between BMI and blood cholesterol level ($\chi^2=7.112$, $p=0.008$). Normal BMI group had 66.7% of total respondents achieved healthy blood cholesterol level whereas underweight, overweight and obese group had 60.3% achieved slightly risk or high risk blood cholesterol level. Therefore, appropriate nutrition intervention programs need to be formulated to achieve healthy BMI among staffs in Health Campus to promote optimal health and wellness.

A20 Whole grain with healthy balanced diet intervention to manage childhood obesity in Malaysia (GReat-Child): study protocol for a quasi-experimental trial

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The rapid increase of childhood obesity is a serious public health problem and has led to the development of many interventions. However, no intervention originating in Southeast Asia has emphasized whole grain as a strategy to manage childhood obesity. This presentation aims to report the study protocol of a multi-component, family-based whole grain with healthy balanced diet intervention for childhood obesity. GReat-Child was a quasi-experimental trial that aimed to manage childhood obesity. Two schools in Kuala Lumpur that had similar demographic characteristics were assigned as intervention and control. Eligibility criteria were overweight/ obese children aged 9 to 11 years who had no serious co-morbidity problems. Children who consumed wholegrain foods in their 3-day diet-recall during screening were excluded. Anthropometric measurements included body weight, height, percentage body fat and waist circumference. Dietary assessment was conducted using 3-day 24-hour diet recalls. Knowledge, attitude and practice on whole grain of children were assessed using a validated questionnaire. The control school did not receive any intervention. Twelve-week intervention comprised three components addressing behavior, personal and environmental factors based on Socio Cognitive Theory, namely: (1) six 30-minute nutrition education lessons which used Food Guide Pyramid and visual plate model in emphasizing the whole grain recommendation and balance diet, (2)

school delivery of wholegrain food on daily basis to provide the opportunity for the children to experience and accept the wholegrain food, (3) individual diet counselling for the parents to increase the availability of wholegrain food and balance diet at home. The GReat-Child programme represents a novel approach to examine the effectiveness of whole grain with healthy eating intervention to manage childhood obesity, we anticipate that this study will not only reveal if whole grain intervention will be effective, it will also provide greater insights into the acceptance and consumption of whole grain among Malaysian children.

A21 Behavioral risk factors of body mass index (BMI-for-age) among Malaysian adolescents living in day-school hostels

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This study aimed to determine the associations between eating behaviors (snacking and meal skipping), energy intake, and energy expenditure with BMI-for-age among adolescents living in day-school hostels. The present study involved 4189 school-going, 13.0 year-old adolescents attending 100 public secondary schools and living in day-school hostels from six regions in Malaysia. A multi-stage stratified cluster sampling method was applied. Body weight and height were measured, whereas BMI-for-age (z-score) was determined using WHO Growth Reference. Eating behaviors were assessed using Eating Behaviors Questionnaire (EBQ). Dietary intake and physical activity were assessed using One-day Dietary and Physical Activity recalls. The prevalence of overweight and obesity [both sexes: 23.4% (95% CI: 22.1, 24.7); male: 21.7% (95% CI: 19.8, 23.8); female: 24.5% (95% CI: 22.8, 26.2)] was about six times higher than thinness (both sexes: 4.3%; 95% CI: 3.7, 5.0; male: 5.6%; 95% CI: 4.5, 6.9; female: 3.4%; 95% CI: 2.7, 4.2). Almost three in four adolescents (77.6%; 95% CI: 76.2, 78.9) skipped at least one meal per week and 99.5% (95% CI: 99.2, 99.7) adolescents snacked between meals per week, with a mean energy intake of 2071 kcal/day (95% CI: 2045, 2096). Mean energy expenditure was 1965 kcal/day (95% CI: 1952, 1978) while mean energy expenditure per kilogram body weight was 46 kcal/ kg (95% CI: 45, 46). Complex Samples General Linear Model analysis shows that being a female ($\beta = -0.023$, 95% CI: -0.285, -0.121) with higher energy expenditure per kilogram body weight ($\beta = -0.025$, 95% CI: -0.026, -0.023) explained 31.2% of variances in BMI-for-age ($F=210.385$, $p < 0.001$). In short, about one-fourth of the Malaysian adolescents were overweight and obese. Future overweight and obesity intervention program should emphasize on sex specific and physical activity approach among adolescents living in day-school hostels.

A22 Assessment of total body water, fat-free mass, fat mass and calf circumference among male club cyclists

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Cycling has become widely popular in Malaysia and globally. Cycling in Malaysia where the temperature is hot and humid can lead to an increase loss of water due to sweating, which makes cyclists more susceptible to dehydration and this will affect one's body composition. The aim of this study was to assess total body water, fat-free mass, fat mass and calf circumference changes among club cyclists from local cycling clubs before and after a cycling trip. A total of 68 male subjects from cycling clubs around the Klang Valley

participated in this cross-sectional study. Measurements of height, weight and mid-calf circumference were taken. Body composition such as total body water (TBW), fat-free mass (FFM) and fat mass (FM) was assessed using a single frequency bioelectrical impedance analyser Maltron BF-906. There was significant reduction in body weight ($70.8 \pm 9.4\text{kg}$ versus $69.8 \pm 9.3\text{kg}$, $p < 0.001$), fat mass ($7.8 \pm 2.3\text{kg}$ versus $7.4 \pm 2.2\text{kg}$, $p < 0.001$) and calf circumference (36.4 ± 2.4 versus 36.3 ± 2.4 , $p < 0.001$) among club cyclists before and after a cycling trip. There was significant increase in total body water (46.0 ± 5.5 ; 45.6 ± 5.5 , $p < 0.001$) and fat-free mass (89.0 ± 2.0 ; 89.5 ± 2.0 , $p < 0.001$) among club cyclists before and after a cycling trip. Nevertheless, there were no significant correlation between the changes in total body water ($r = -0.014$; $p = 0.908$), fat-free mass ($r = -0.103$; $p = 0.405$) and fat mass ($r = 0.093$; $p = 0.45$) against the changes in body weight among club cyclists. Male club cyclists experienced a significant reduction in body weight, fat mass and calf circumference after a cycling trip. On the other hand, total body water and fat-free mass have been found to be significantly increased after a cycling trip.

A23 Validity and reliability of the Neighbourhood Environment Walkability Scale (NEWS) – Malay version

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The NEWS was originally developed by the International Physical Activity and the Environment Network (IPEN) group to obtain residents' perceptions of the environment characteristics in their neighbourhood. The objective of this study is to translate and validate the questionnaire and determine its reliability for use among local residents. It assessed the following environmental characteristics: a) residential density; b) proximity to non-residential land uses, e.g. eating outlets and shops; c) access to non-residential land uses; d) street connectivity; d) walking/cycling facilities, e.g. sidewalks and pedestrian/bike trails; e) aesthetics; f) pedestrian and traffic safety; and g) crime safety. The subscales were rated on a 4-point Likert scale from 1 (strongly disagree) to 4 (strongly agree), except residential density and proximity to non-residential land uses subscales. The questionnaire was translated from English to Malay and another back-translation was conducted. The research team verified the quality of the translated and back-translated questionnaire and made cross-cultural adaptations to reflect the built environment of Malaysia. The translated instrument was distributed to 66 adults for self-administration (with guidance from research staff), completed on two separate occasions two weeks apart. Confirmatory factor analysis and test-retest reliability indices were used to determine its validity and reliability. Test-retest reliability was moderate to good except three items under 'aesthetics' and 'pedestrian traffic safety', with intra-class correlation coefficients (ICC) ranging from 0.56 to 0.91. Items with low ICCs had high percent agreement indicative of good reliability. Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy value was 0.521, indicating a satisfactory factor analysis. Bartlett's Test of Sphericity was significant ($p < 0.001$). Six factors were retained based on original questionnaire and guidelines, and the curve from Scree plot also began to flatten at factor 6. The NEWS-Malay possesses sufficient levels of factorial validity and reliability to be used for measuring perceived neighbourhood environment in Malaysian adults.

A24 Accuracy of three Android-based pedometer applications in laboratory and free-living settings

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Pedometer applications (apps) are becoming popular as monitoring tools of physical activity, however their accuracy in counting steps are seldom reported. This study aimed to examine validity of three popular free Android-based pedometer apps, namely Runtastic, Pacer Works, and Tayutau in laboratory and free-living settings. In laboratory setting, 48 subjects (13 males, 35 females; mean age 22.5 ± 1.4 years) completed three-minute bouts of treadmill walking at five incremental speeds (3.2, 4.0, 4.8, 5.6, 6.4 kmh^{-1}) by carrying a test smartphone (Samsung Galaxy S4 GTI9500) with the three installed apps. Each participant repeated the experiment thrice, placing the test smartphone either in their pants pockets, at waist levels, or secured to their left arms by armbands. The actual step count were recorded by using a tally counter. In free-living settings, 44 subjects (11 males, 33 females; mean age 21.9 ± 1.6 years) each carried a smartphone with installed apps and a reference pedometer (Yamax Digi-Walker CW700) for seven consecutive days. Step count data were included if they completed at least 10 hours of recording per day. Mean absolute percent error (APE) for step counts was calculated for each app by using the formula: (tally counter-pedometer apps)/tally counter $\times 100\%$. In laboratory setting, the APE of Tayutau was the least, which was 6.7%. Runtastic significantly underestimated steps at all conditions (APE=16.8%). Pacer Works significantly overestimated steps when the smartphone was placed in the pocket or secured to the waist, but underestimated steps when the smartphone was secured to the arm (APE=19.7%). In free-living settings, the APE relative to Yamax was 16.6% for Runtastic, 18.0% for Pacer Works, and 16.8% for Tayutau. Moderate Pearson correlations were found between Yamax and Runtastic ($r=0.465, p<0.01$), Pacer Works ($r=0.476, p<0.01$) and Tayutau ($r=0.583, p<0.001$). Overall, Tayutau was the most accurate among the three applications in counting steps in laboratory setting. However, none of the application counts steps accurately in free-living setting.

A25 Assessment of nutritional and physical activity status among adults living in low-cost housing in Selangor, Malaysia

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This study aimed to assess the nutritional and physical activity status among adults living in low-cost housing. This cross-sectional study involved 115 adults aged from 18 to 59 years old. Anthropometric and body composition measurements of height, weight, body fat percentage, waist and hip circumference were taken. Biochemical measurements included blood glucose, blood cholesterol and blood pressure. Dietary intake was evaluated by interviewing subjects using Food Frequency Questionnaires (FFQ). Physical activity status was determined by interviewing subjects using International Physical Activity Questionnaire (IPAQ). The mean body mass index (BMI) for men and women were $27.25 \pm 6.34 \text{ kg/m}^2$ and $28.46 \pm 5.29 \text{ kg/m}^2$ respectively. The body fat percentage for men were $27.16 \pm 8.01\%$ while women were $43.03 \pm 9.97\%$. The waist-hip ratio of men and women were 0.92 ± 0.07 and 0.86 ± 0.06 respectively. For the biochemical results, the mean systolic pressure was $128.83 \pm 18.81 \text{ mmHg}$ while the diastolic pressure was $78.15 \pm 12.05 \text{ mmHg}$. Mean blood glucose was reported to be $6.56 \pm 3.19 \text{ mmol/L}$ while the mean blood cholesterol was $5.24 \pm 0.95 \text{ mmol/L}$. Overall energy intake for 95 subjects was $2705 \pm 603 \text{ kcal}$ with the macronutrients distribution of 53.41% carbohydrate, 13.47% protein and 32.49% fat. According to the Malaysia's Recommended Nutrient Intake (RNI), the nutrients that achieved RNI are zinc (106.41%), selenium (123.31%), riboflavin (129.66%), niacin (103.52%), vitamin E (135.91%) and vitamin C (98.28%) whereas calcium (73.10%), thiamin (70.48%), folate (25.04%) and vitamin A (19.55%) do not achieve RNI. For the physical activity assessment, it was shown that subjects have the mean of $6739.84 \pm 8135.62 \text{ MET-min/week}$. There is no association observed between IPAQ score and BMI ($p=0.439$), body fat percentage ($p=0.246$), waist-hip ratio ($p=0.088$), systolic pressure ($p=0.360$), diastolic

pressure($p=0.959$), blood glucose($p=0.366$), blood cholesterol($p=0.796$) and other nutrients except for a weak correlation between IPAQ score with folate($r=0.203$, $p=0.030$) and vitamin C($r=0.188$, $p=0.045$). In conclusion, the adults living in low-cost housing have unsatisfactory nutritional status but good physical activity status which might be contributed by their occupation. Thus, more interventions and nutrition education are needed to improve the diet among the population.

A26 Nutritional Status and Health Status among lacto-ovo vegetarians in Kuala Lumpur, Malaysia

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Previous studies reported that lacto-ovo vegetarians had low risk of diabetes mellitus, cancer, cardiovascular disease, aging and high blood pressure due to their nutrient intake. The aim of the study was to determine the nutritional status and health status among lacto-ovo vegetarians in Kuala Lumpur, Malaysia. A total 44 Chinese lacto-ovo vegetarians (17 male and 27 female) aged 20 to 59 years old participated in this study. An interview administered questionnaire was used to evaluate sociodemographic information, health status and food intake pattern. Height, weight and waist circumference, percent body fat and haemoglobin level were measured to determine nutritional status of subjects. 3 days 24 hour recall (2 days week day and 1 day weekend) was taken to determine food intake. Majority of subjects (68.1%) had normal body mass index, normal fat percentage (52.3%) and waist circumference (72.7%) however only 48% lacto-ovo vegetarians had normal haemoglobin level. None of the subjects were smoker but 11.4% drank alcohol. 70.5% subjects had no non-communication diseases while only 15.9% had high cholesterol and 4.5% were diabetes mellitus. The intake of protein, riboflavin, niacin, vitamin C and iron meet the requirement of RNI but not for energy, thiamin, calcium and zinc in male lacto-ovo vegetarians. The intake of vitamin C meets the requirement of RNI only in female lacto-ovo vegetarians. In conclusion, generally the lacto-ovo vegetarians demonstrated good nutritional status and health status. Nutrient of concern and may be at risk were energy, thiamin, calcium and zinc.

A27 Infant feeding practices and the nutritional status of infants 0-12 months of age attending the Health Clinic Desa Sikamat, Seremban

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Adequate nutrition is essential for the health and development of a child. The 'critical window' which is also known as the 1000 days period is a crucial period to provide adequate nutrition for the promotion of optimal growth, health and behavioural development of a child. The objective of this study is to investigate the infant feeding practices and the nutritional status of infants 0-12 months of age attending the Health Clinic Desa Sikamat, Seremban. This is a cross-sectional study which involved total of 75 mothers-infant pairs from the Health Clinic Desa Sikamat in Seremban. The anthropometry measurements of infants were collected followed by the interview session with the mothers on the types of infant feeding practices. The result showed the prevalence of exclusive breastfed infants attending the health clinic below age of two months and aged four to five months were 20% and 12% respectively. The prevalence of complementary feeding at ≥ 6 months of age was 22.7%. The prevalence of wasted ($-2SD$ to $-3SD$) infants was 5.3% and the healthy

infants were 94.7%. There was no association between exclusively breastfeeding, mixed feeding and formula milk feeding with the nutritional status of infants aged 0-12 months. However, there was association between complementary feeding and the nutritional status of infants ($p < 0.05$). It was also found that maternal occupation is associated with the nutritional status of infants. In conclusion, the practice of exclusive breastfeeding of mothers to their infants was low because of other feeding practices such as mixed feeding, early complementary feeding and formula milk. Hence, more interventions are required to increase the practice of exclusive breastfeeding up to 6 months of age.

A28 Factors associated with sleep disturbance among undergraduate students from a selected university in Selangor

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Sleep disturbance; one of the health problems that commonly present among university students is associated with various related chronic diseases such as obesity and cardiovascular disease. This cross-sectional study aimed to determine factors associated with sleep disturbance from a selected university in Selangor. Factors that were included in the study were socio-economic status, academic background and performance, nutritional status, level of physical activity and level of stress. A total of 160 subjects from Universiti Putra Malaysia (UPM) were randomly recruited from 6 faculties by using a multi-stage sampling method. Subjects' anthropometric measurement (height, weight, waist circumference and body fat density) was measured. Blood pressure was also being measured for the clinical assessment of the nutritional status. Subjects were then asked to answer the self-administered questionnaire consisting of socio-economic status, academic background and performance, Food Frequency Questionnaire (FFQ) for dietary intake, International Physical Activity Questionnaire (IPAQ) for physical activity level as well as Depression, Anxiety and Stress Score (DASS 21) for stress level. The mean age for subjects was 22 years old and their average Body Mass Index (BMI) was 22.25 ± 3.97 with no significant difference between male and female subjects ($p > 0.05$). This study found that 80.0% of them were reported to have sleep disturbance; female (61.0%) and male (39.0%) respectively and with no significant difference in the total score of PSQI between male and female subjects ($p > 0.05$). Current year of study ($r = -0.16$, $p = 0.04$), protein intake ($r = -1.59$; $p = 0.04$) and the stress level in the context of depression, anxiety and stress score ($r = 0.37, 0.45, 0.45$; $p = 0.00$ respectively) were the factors found to be associated with sleep disturbance ($p < 0.05$). In conclusion, about 80% of the undergraduate students from the selected university in Selangor were reported to have sleep disturbance. Subjects who were at the initial year of the study, had low protein intake and with high stress level were the one having sleep disturbance.

A29 Physical activity and mixed land use in relation to nutritional status of adults in Kota Bharu

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Mixed land use represent a built environment that may influence physical activity. Examples of mixed land use are stores, mosques, schools, post-offices and banks. The objective of this study is to determine correlation of mixed land-use with nutritional status and physical activity level among adults in Panji, Kota Bharu. A total of 76 adult (26 male, 50 female) with mean age (42.2 ± 13.7 years) were selected from a household by cluster sampling within Panji sub-district, Kota Bharu. Anthropometric measurements of Body

Mass Index (BMI) and waist hip ratio (WHR) were measured based on weight, height, waist and hip circumference. Self-administered questionnaire on socio-demography and mixed land-use (29 item) adapted from Neighbourhood Quality of Life Study of IPEN questionnaire were used. Physical activity was assessed by using accelerometer (Actigraph) which respondent have to wear for 7 days. The mean BMI was $(26.3 \pm 5.1 \text{ kg/m}^2)$. Based on WHO's BMI classification, 3.9% were underweight, 36.8% were normal, 35.5% were overweight and 23.7% were obese. The mean WHR was (0.82 ± 0.09) . 36.8 % of are considered as high risk of abdominal obesity and 63.2% are at low risk of abdominal obesity. The average steps measured used by accelerometer were $(4813 \pm 1735 \text{ steps})$. Hence, based of 5 physical activity categories using steps, the results show 53.9% were sedentary ($<5,000 \text{ steps/day}$), 36.8 % were low active ($5,000-7,499 \text{ steps/day}$), and 9.2% were somewhat active ($7,500-9,999 \text{ steps/day}$). There were no result for active ($10,000-12,499 \text{ steps/day}$) and highly active ($\geq 12,500 \text{ steps/day}$). The mean mixed land use score was (67 ± 25) with minimum score was 23 and maximum score was 123. There were no significant correlations between BMI and average steps, mixed land use score and average steps, BMI and mixed land use score. Hence, it can be concluded that nutritional status and physical activity of is not affected by mixed land use.

A30 Nutritional status and physical activity: perceived benefits and barriers vs objective measures among Penang Island adults

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Physical activity plays an important role in preventing diseases. Even though many people are aware of its benefits in improving health, research has shown that Malaysia has led to a decline in physical activity. Hence, this cross - sectional study was carried out to determine the factors affecting physical activity and nutritional status among adults in Penang Island. The nutritional status is assessed by measuring height, weight, waist circumference and hip circumference to calculate Body Mass Index (BMI) and waist-hip ratio (WHR). The factors affecting physical activity are assessed by distributing Exercise Benefits and Barriers Scale (EBBS) Questionnaire to 77 adults (31 males, 46 females) aged 18 to 65 years old. The questionnaire consists of 43 items (29 items benefits scale, 14 items barriers scale). Accelerometer (Actigraph) is used to count the steps for 7 days. A majority of respondents were Malay (76.6%) followed by Chinese (15.6%), Indian (5%) and others (1.3%). The mean for BMI and WHR are $26.2 \pm 6.8 \text{ kg/m}^2$ and 0.84 ± 0.16 respectively while the average steps counted for 7 days are $5632 \pm 2129 \text{ steps}$. Only 2 respondents are in active category ($10,000 - 12,499 \text{ steps/day}$), 12 in somewhat active ($7500 - 9999 \text{ steps/day}$), 30 in low active ($5000 - 7499 \text{ steps/day}$) and 33 in sedentary ($<5000 \text{ steps/day}$). The highest step counted was 17,871 in a day while the lowest step counted was 141 in a day. Most of the respondents are in normal weight (32.5%) followed by overweight (28.6%), obese (24.7%) and underweight (14.3%). The mean for benefits scale and barriers scale are 89.69 ± 8.58 and 41.47 ± 4.77 respectively while the mean EBBS total score is 131.16 ± 11.61 . It is also found that Penang Island adults have greater total perceived benefits than barriers to exercise significantly with benefits score [$t(77) = -42.42, p < 0.001$] and barriers score [$t(77) = -165.10, p < 0.001$]. However, there is no significant association between benefits score and average steps counted. In conclusion, the EBBS score does not reflect the physical activity among adults in Penang Island.

A31 Sociodemographic factors, food security and mental health status among mothers in Mentakab, Pahang

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Food insecurity is associated with a wide range of health outcomes for adults, especially mothers. Households suffering from food insecurity are more likely to have mothers who have lower nutrient intakes and greater probabilities of mental health problems. A cross-sectional study was conducted to examine the relationship between food security and mental health status among mothers in Mentakab, Pahang. A total of 129 mothers aged 20 years to 59 years old were selected. The respondents were interviewed to obtain information on sociodemographic backgrounds, food security status (10-item Radimer/ Cornell hunger scale), mental health status (DASS-21 instrument) and dietary intake (24 hour dietary recall). Weight and height were assessed using TANITA weighing scale and SECA body meter. Majority of the respondents were Malay (69.0%), followed by Indian (18.6%) and Chinese (12.4%). The mean age of respondents was 38.30±9.701 and the mean household income was RM2146.61±802.45. The findings indicated that about 53.5% of households were food insecure. The factors that contributed to food insecurity were age of respondents, year of schooling, numbers of children, household income and households size ($p<0.001$). There were a significant mean different of years of schooling, numbers of children, households size and household income ($p<0.05$) according to depression status. Besides that, it were significant mean different to age of respondents, numbers of children, households size and household incomes ($p<0.05$) based on anxiety status. Similarly, it was significantly mean different of household income ($p<0.05$) based on stress status. This study also indicate that food security is significantly associated with the depression, anxiety and stress ($p<0.05$). In conclusion, food insecurity can contribute to the mental health problem such as depression, anxiety and stress. Health promotion campaign on lifestyle management should be organized for women in order to improve their mental health.

A32 Physical activity status and its associated factors among Malaysian children with epilepsy

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Children with epilepsy traditionally led sedentary lifestyles and the reasons for their physical inactivity are likely to be a combination of myth, stigma and prejudice. This resulted in the International League Against Epilepsy in 1997 advocating a normal lifestyle among patients with epilepsy. There has been no physical activity studies to date among children with epilepsy in Asia. Thus, the aim of the present study was to determine the physical activity (PA) status of Malaysian children with epilepsy and factors that may limit their PA participation. A total of 58 patients aged between 4 to 18 years with history of taking antiepileptic drugs (AEDs) for ≥ 1 year were enrolled in this cross-sectional study. PA was assessed using Children's Physical Activity Questionnaire (cPAQ) and metabolic intensity (METPA) score was calculated. Parents of ambulant children and children without intellectual development problem were also interviewed on exercise-related seizures.

Medical history was completed by the attending physician for duration of epilepsy and number of AEDs taken. Children with epilepsy had significantly lower ($p < 0.05$) PA compared to healthy children, particularly in moderate-intensity activities (MVPA) [median(IQR): 147.5(10.9;380.3) mins/week vs 345.9(120.0;530.3) mins/week], moderately-vigorous activities (MVPA) [362.2(50.3;517.50) mins/week vs 545.3(198.6;692.5) mins/week] and vigorous activities [0.0(0.0;101.3) mins/week vs 119(60.0;261.8) mins/week]. Those receiving ≥ 3 AEDs had significantly lower ($p < 0.05$) METPA scores 1940(1109;2926) compared to those receiving ≤ 2 AEDs 1157(1150;2925). Length of time since diagnosis was inversely correlated with METPA scores ($r = -0.315, p < 0.05$). Children who have seizures during or immediately after exercise (4.7%) had less MVPA [187.5(156.6;611.3) mins/week] compared to those without [630.0(9402.5;947.5) mins/week]; while children's METPA score was not significantly different ($p = 0.185$) between those whose activities were restricted by their parents and those who were not. In conclusion, children with epilepsy were generally less active than their healthy counterparts in particular those on polytherapy > 2 AEDs; duration of epilepsy and occurrence of seizures during exercise may influence their PA status. Programs that promote exercise among Malaysian children with epilepsy to improve their PA status is important to prevent long-term effects of physical inactivity.

A33 Prevalence of undernutrition and its associated factors among children in Pendang district, Kedah

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One-third of world mortalities during the first 5 years of life are attributed to undernutrition, which are by large preventable through public health measures. Therefore, a cross-sectional study was conducted to determine factors associated with undernutrition status among children aged 6 years old and below. Out of eleven, seven kindergartens in Pendang, Kedah were chosen as study locations. A total of 64 children who fulfilled the study criteria were recruited into this study. Their weight, height and dietary intakes were assessed using calibrated scales and 24-hour diet recall, respectively. Anthropometric data were analysed using WHO Anthroplus software, whereas dietary data were analysed using Nutritionist Pro™ Software and compared with Recommended Nutrient Intakes Malaysia 2005. The prevalence of stunting and underweight was 25.0% and 48.4% respectively. Using weight-for-age and weight-for-height indicators, 51.6% and 59.4% of children were found to be wasted, correspondingly. Malays constitute the highest ethnicity (75.0%) with 70.3% of participants' mothers were educated at secondary education level and were unemployed (62.5%). The majority of the household income was between RM1000-RM3000 (42.2%). Mean intakes of children for energy, carbohydrate, protein and fat were 1108.4 ± 190.2 kcal, 155.48 ± 39.12 g, 46.71 ± 14.02 g, and 40.60 ± 14.91 g, respectively. Maternal unemployment was significantly associated with stunting ($\chi^2 = 8.889, p = 0.003$). Low birthweight ≤ 2.5 kg ($\chi^2 = 5.590, p = 0.018$) and child's age ($t = -2.040, p = 0.046$) was significantly associated with wasting status. Majority of subjects did not meet the RNI for energy (84.4%) and carbohydrates (59.4%) with significant proportional differences in each undernutrition status ($p < 0.05$). Undernutrition was found to be very common among children in Pendang, with wasting constitute the most. Maternal and child's early life factors including insufficient energy intakes tend to have influence on undernutrition in children from Pendang, Kedah.

A34 Nutritional status of secondhand smoke exposed mothers and children

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This study aimed to compare the nutritional status of mothers and children who were living with smoking and non-smoking fathers. This cross sectional study comprised of respondents from Universiti Sains Malaysia (USM) Pregnancy Cohort Study 2009. Data collection was conducted from April 2013 until December 2013 by visiting respondents' houses in the state of Kelantan, Malaysia. A total of 127 mother-offspring pairs whose mothers aged between 20 to 50 years and the children who had reached 24 to 36 months were involved in the present study. Socio-demographic information was obtained using interviewer-administered questionnaires while maternal and children's anthropometry were measured by using standardized protocol. Those who were living with smoking and non-smoking fathers were defined as secondhand smoke (SHS) exposed group and non-secondhand smoke (non-SHS) exposed group respectively. Independent t-test was applied to compare the nutritional status between SHS exposed and non-SHS exposed mothers and children. A total of 51.6% of the mothers and children was exposed to SHS by smoking fathers. None of the mothers reported smoking. The mean BMI, total fat mass and waist circumference of SHS exposed mothers [25.24 (SD 4.45) kg/m²; 22.10 (SD 8.40) kg; 71.61 (SD 10.16) cm] were significantly higher ($p < 0.05$) than the non-SHS exposed mothers [(23.56 (SD 4.05) kg/m²; 18.78 (SD 6.89) kg; 66.95 (SD 7.66) cm]. However, no significant difference was observed in children's anthropometric measurements between those who were living with smoking and non-smoking fathers. In conclusion, non-SHS exposed mothers had a better nutritional status in term of anthropometry outcomes compared to SHS exposed mothers. Such association was not observed in children.

A35 Association of dietary intake, physical activity level and eating behavior with body weight status among adolescents in Putrajaya

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Obesity is one of the major public health problems worldwide and it is a common nutritional problem among children and adolescents. This cross-sectional study was conducted to determine the associations between dietary intake, physical activity level and eating behavior with body weight status among secondary school students in SMK Putrajaya Presint 16(1). Respondents completed a self-administered questionnaire including measures of socio demographic data. Dietary intakes were measured using 24-hour diet recall and total energy and macronutrient were compared with Recommended Nutrient Intake (RNI) value. Physical activity level was assessed using Physical Activity Questionnaire for adolescent (PAQ-A) and eating behavior was assessed using Eating Behavior Questionnaire (EBQ). Body weight and height were measured and Body Mass Index (BMI) was calculated. A total of 180 respondents aged 14-16 years old with equal number of male and female participated in this study. 97.2% of the respondents were Malays and the household income ranged from RM 800-RM24000. The mean of total energy intake for 14 and 16 years old were 2118±605 kcal and 2179±593 kcal respectively. Majority (77.2%) of the respondents skipped meals 2-3 times/week, snacked between meals (91.1%) and having moderate physical activity level (53.9%). The prevalence of overweight and obesity (27.2%) was about four times than the underweight (6.1%). Energy intake ($r=0.229, p < 0.05$) and fast food

consumption ($r=0.156, p<0.05$) were positively correlated with BMI while snacking behavior was inversely correlated with BMI ($r=-0.171, p<0.05$). There is significant association between type of dietary practices and body weight status ($p<0.05$). However, socio-demography, meal skipping, eating companion and physical activity level were not associated with body weight status. Body weight status was associated with energy intake, snacking, fast food consumption and types of dietary practices. Thus, promoting healthy eating practices and have physically active lifestyle should be emphasised among adolescents to achieve healthy body weight.

A36 Development and testing of pictorial nutrition and activity knowledge scale among people with intellectual disabilities

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Obesity is an increasing health problem where Malaysia is considered as the leading countries with this problem in Asia region. The aim of this study was to assess the reliability and validity of Malay version of Nutrition and Activity Knowledge Scale (NAKS) among people with Intellectual Disability (ID). A total sample of 180 respondents (96 males, 84 females) aged between 4 and 43 years old with mild to moderate ID was involved in the study. The questionnaire consists of 29 items answered on a multiple-choice format, assessing two knowledge dimensions related to the nutrition and physical activity. The internal consistency reliability of the questionnaire was tested using Kuder-Richardson 20. The result showed there was significant association between the items with the value of 0.78 ($\alpha=0.78$). The difficulty index values showed 27 items were considered as acceptable items whereas another 2 items were considered as poor items. Meanwhile, the discrimination index values indicated 17 items were excellent, 2 items were good, 6 items were acceptable and 4 items were poor. The validity of each question was determined based on these two index values. The questions should be removed if both difficulty and discrimination index values were classified as poor items. Otherwise, the multiple-choices answers of the questions should be changed if either one of the index values were classified as poor item. As a conclusion, the Malay version of NAKS was reliable and valid for the assessment among ID people.

A37 Factors associated with cognitive ability among adolescents in secondary schools in district of Gombak

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Cognitive ability among adolescent has been reported to link with several factors. Few studies have been conducted to identify the link between socio-demography, breakfast pattern, screening time, sleep quality and cognitive ability among adolescents but the relationship was unclear. This study aimed to identify the factors associated with cognitive ability among adolescents in district of Gombak. A total of 152 subjects aged 13 to 16 years (mean age: 15.01 ± 1.11) in two secondary schools in the district of Gombak participated in this study. A modified Breakfast Survey of Students, Adolescents Sedentary Activity Questionnaire (ASAQ) and Pittsburgh Sleep Quality Index were used in the study. Cognitive was objectively measured using Wechsler Non Verbal Scale of Ability. Results showed that the mean cognitive ability score was 105.52 ± 12.76 . Male have higher cognitive ability compare to female ($t=3.224, p<0.05$). Breakfast intake ($r=0.794, p=0.000$) were positively

correlated with cognitive ability. Watching TV during weekdays ($r=-0.160$, $p<0.05$) and weekends ($r=-0.377$, $p<0.05$), using computer during weekdays ($r=-0.487$, $p<0.05$) and weekends ($r=-0.390$, $p<0.05$), using smartphone during weekdays ($r=-0.173$, $p<0.05$), total screening time during weekdays ($r=-0.437$, $p<0.05$) and weekends ($r=-0.517$, $p<0.05$) were negatively correlated with cognitive ability. The findings of this study emphasized that high breakfast intake, low screening time were linked to higher cognitive ability among adolescents.

A38 Body weight status, eating behavior, physical activity level and depressive symptoms among adolescents in Putrajaya

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Common mental disorders in adults often initially emerge in childhood and adolescence. This cross sectional study was conducted to determine the associations between body weight status, eating behavior, and physical activity level with depressive symptoms among adolescents in SMK Putrajaya Presint 16(1). A set of self-administered questionnaire of Eating Behavior Questionnaire (EBQ), Physical Activity Questionnaire for Adolescents (PAQ-A) and Depression, Anxiety and Stress Scale (DASS-21) was used to measure eating behavior, physical activity level and depressive symptoms respectively. Height and weight were measured and Body Mass Index (BMI) was calculated. A total of 180 subjects, age ranged from 14 to 16 years old participated in this study. Majority of the subjects were Malays (96.7%) and there were equal distribution of gender among the subjects. The prevalence of depressive symptoms was 17.3%. Most (66.7%) of the subjects have a normal BMI, with 27.2% were overweight and obese and only 6.1% were underweight. Majority of the subjects skipped meals 2-3 times per week (40.6%), had snacking between meals (91.1%), had meals with family (72.8%) and moderate level of physical activity (53.9%). A significant lower mean breakfast consumption ($t=5.327$, $p=0.000$) and higher mean skipping meal behavior ($t=2.600$, $p=0.010$) were observed among adolescents with depressive symptoms. Only 13.7% of the subjects with depressive symptoms had meal with family as compared to those without the depressive symptoms ($\chi^2=4.092$, $p=0.043$). BMI was not significantly correlated with depressive symptoms ($r=0.06$, $p=0.934$). Breakfast consumption ($r=-0.324$, $p=0.000$) and physical activity level ($r=-0.188$, $p=0.011$) were inversely correlated with depressive symptoms. The findings suggest that breakfast consumption, skipping meal behavior, eating companion and physical activity level were associated with depressive symptoms among adolescents. Thus, multiple strategies that take into consideration these factors might offer great potential to reduce the depressive symptoms among adolescents.

A39 Body weight histories, perceptions of body weight status, body image and dieting behaviours among adolescents

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Various factors affect perceptions of body weight status, body image and dietary behaviours among adolescents. However, research that investigates these perceptions in relation to body weight histories is rare. This study aimed to determine the effect of body weight histories on the perceptions of body weight status, body image, and dieting behaviours among 15- to 16-year-old adolescents. A total of 195 subjects (86 boys; 109 girls) were recruited from Form Four classes in a high school in Sungai Petani, Kedah. Subjects underwent body weight and height measurements and completed a self-administered

questionnaire on perception of body weight status, body image, and dieting behaviours. A complete set of body weight and height records from Standard One to Form Three were collected and current body weight status was determined based on BMI-for-age. Subjects were categorized into seven weight categories in relation to the onset time of underweight or obesity. Study showed that perception of body weight status, body image and dieting behaviours did not differ significantly between early onset (before 13 years old) and late onset of underweight and obesity. However, normal-weight subjects with a history of obesity had a larger body image perception than their normal-weight counterparts ($p < 0.05$). BMI-for-age for ages 7 to 15 years were positively correlated with the perception scores of body weight status ($0.45 < r < 0.76, p < 0.01$), body image ($0.54 < r < 0.80, p < 0.01$), and dieting behaviours ($0.25 < r < 0.49, p < 0.01$). These Spearman's Rho correlation coefficients increased with age. In conclusion, normal weight adolescents who were previously overweight or obese scored higher in the perceptions of their current body weight status and body image. However, the onset time of underweight and obesity (early or late) had no significant influence on their perceptions of body weight status, body image, and dieting behaviours. This study suggested that body weight histories should be taken into account when studying body images and eating behaviours of adolescents.

A40 Malnutrition among indigenous pre-school children in gua musang, Kelantan

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The objective of this study was to determine the prevalence of malnutrition and food intake among pre-school indigenous children at Pos Hendrop, Pos Balar and Pos Tohoi. A total of 234 pre-school children from Temiar subs-tribes aged 1 – 5 years (120 males and 114 females) were involved in this study. A pre-tested questionnaire was used to obtain the socio-demographic information and the anthropometric measurements included body weight and height. Their energy intake was obtained from the two days 24-hour dietary recall. Our study revealed that the prevalence of underweight, stunting and wasting was 44.9%, 77.4% and 4.7% respectively. The mean daily energy intake of the subjects was 739 ± 168 kcal/d which is lower compared to RNI (2005). Overall, the mean proportion of macronutrients intake of the subjects were approximately 130 g carbohydrates (70%), 19 g protein (10%) and 17 g fat (20%) of their total energy intake per day. Comparing to the RNI (2005), the protein intake among children aged 1 – 3 years was slightly higher but was slightly lower among age group 4 – 5 years. Independent t-test revealed that there was no significant difference of mean daily energy intake, carbohydrate and protein intake ($p > 0.05$) between both gender aged 1 – 3 years with exception of fat intake ($p < 0.01$). However, children aged 4 – 5 years for both gender showed no significant difference neither in energy daily intake nor macronutrients intake ($p > 0.05$). One-way ANOVA reported that there was a significant difference of macronutrients intake between the three settlements ($p < 0.01$) except for their daily energy intake ($p > 0.05$). Pos Balar noted the highest mean of carbohydrate intake (145 g) and Pos Hendrop reported the highest mean of protein (23g) and fat intake (20 g). These finding reveals that the prevalence of malnutrition among the indigenous pre-school children is a major concern in Gua Musang, Kelantan. Their dietary pattern is lagging behind compared to their RNI. Thus, an immediate action is compulsory in overcome this issue.

A41 The association between school compliance towards “Whole-School Environmental Mapping Framework” and weight status of school children: a preliminary study

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There is evidence to suggest that the school environment has significant contributions to the rising of childhood obesity. The objective of this study therefore to examine the association between school compliance toward “Whole-School Environmental Mapping Framework” (physical, economic, political and socio-cultural) with weight status of school children in Terengganu. The study design was a cross-sectional study. A total of 10 schools were randomly selected (4 urban and 6 rural in Kuala Terengganu and 20 teachers have been interviewed face to face by using a set of validated Malay version “Whole-school Environmental Mapping” questionnaire. Twenty-five children aged 10 and 11 years were randomly selected from each school in which their weight and height were measured to calculate body mass index (BMI). BMI was defined using WHO 2007 reference chart. This study has demonstrated that non-compliance schools (n = 8) have significantly higher proportion of obese children compared to schools that comply (n = 2) with the “Whole-School Environmental Mapping Framework”. As a conclusion, this study has produced evidence that the school environmental factors may contribute to the higher prevalence of childhood obesity. Advanced improvement needs to be highlighted since the level of compliance towards the school environmental mapping is very low while the prevalence of obesity is high.

A42 Relationship between knowledge and consumption of soy products with nutritional status among children aged 9 to 11 years in Sekolah Kebangsaan Seri Setia Kuala Lumpur

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Soybean based products are part of Malaysians’ diet. However, the level of soy products intake among children is still not clearly known even though soy products intake recommendations are available in the *Malaysian Dietary Guidelines for Children and Adolescent*. The objective of this study was to determine the level of knowledge and consumption soy products with nutritional status among children in primary schools. A total of 187 subjects were selected by random purposive sampling. Subjects were interviewed to get information on their socio-demographic information, anthropometric measurements, the habitual soy products intake as well as the level of knowledge and consumption of soy products. Subjects were separated into soy and non soy consumer based on their soy products consumption. Soy consumers were interviewed for their soy products consumption through Food frequency questionnaire (FFQ) and two day diet recall. The results showed that majority of soy consumer subjects were in the normal weight category (67.0%) according to BMI (Body Mass Index) for age and have normal waist circumference percentiles (65.2%). There was a significant relationship ($p < 0.05$) between knowledge on soy products with BMI for age of the subjects. In addition, the most favored soy product was soybean milk (88.7%). The subjects’ (n=115) knowledge on soybean products were in the medium category (60.0%). Consumption of soy products (186.5 g/day) and isoflavones (58.93 mg/day) from FFQ method was higher than two days dietary recall interview (138.3 g soy products/day and 40.5 mg of isoflavones/day). The most favored soybean products obtained through FFQ and two days dietary recall were soy milk, tau foo fah, egg tofu and tempe. There was a significant difference ($p < 0.05$) between

the soy products intake with BMI for age and waist circumference percentiles. Spearman rank correlation was used to identify the relationship between the level of knowledge and consumption of soy products and isoflavone in the nutritional status of children (BMI for age and waist circumference percentiles). Result showed there was no relationship between knowledge and consumption of soy products and isoflavone in the nutritional status among these primary school children. The conclusion for this study showed that the level of knowledge and consumption of soy products and isoflavones do not have a relationship with either nutritional status of children who were in underweight, normal or overweight/obese categories.

A43 Nutritional status and physical activity level among Royal Malaysia Police (RMP) personnel and trainees at Police Training Centre, Air Hitam, Negeri Sembilan

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This study was conducted to evaluate the nutritional status and physical activity level of police personnel and trainees in a police training centre. A total of 156 (personnel n=45, trainees n = 111) respondents within the age range of 19 - 50 years participated in this study. Nutritional status assessment was based on anthropometric measurements with body mass index (BMI), waist circumference (WC), waist-to-hip ratio (WHR) and total body fat (TBF) percentage, as well as 24-hour dietary recall for one day on a weekday. Physical activity level was assessed using International Physical Activity Questionnaires Short Form (IPAQ-SF). 24-hour dietary recall was analysed using the Nutritionist Pro software. On average, the police trainees were found to have better nutritional status than the police personnel. Approximately, 42.2% and 8.3% of police personnel were within overweight and obese range respectively with the average BMI of 27.75 ± 4.28 kg/m². Meanwhile, 23.4% of the trainees were within overweight range with the average BMI of 23.10 ± 2.81 kg/m². For WC, 57.8% of the police personnel and 35.1% of the trainees had WC above the cut-off point of 90 cm for male and 80 cm for female. In terms of WHR, the majority of the police personnel (86.7%) and trainees (92.8%) had WHR below the cut-off point which is 1.0 for male and 0.85 for female. About 1.9%, 63.5%, and 34.6% of the respondents have low, normal, and high TBF percentage respectively. The average energy intake for police personnel and trainees was 1419 ± 479 kcal and 1843 ± 579 kcal respectively. Overall, only 25.0% of the respondents fulfilled Malaysia Recommended Nutrient Intake 2005 (RNI) in terms of energy intake. IPAQ results revealed that majority of the respondents were categorized as physically active (90.4%). Pearson correlation test showed that physical activities were inversely correlated ($p < 0.05$) with BMI, WC, and WHR. Further study could be conducted to determine factors associated with overweight and obesity problem among Royal Malaysia Police (RMP) personnel and trainees.

A44 Body image dissatisfaction, high nutrition knowledge and macronutrient intake as predictors of body weight status among Chinese vegetarians in Selangor

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This cross-sectional study aimed to determine factors associated with body weight status among Chinese vegetarians in a Buddhist Society in Selangor. A total of 131 Chinese vegetarians with a mean age of 33.7 years ($SD=10.4$) participated in this study. Respondents

completed a self-administered questionnaire on socio-demographic backgrounds, eating behaviours, physical activity, nutrition knowledge and body image perception. Weight and height were measured and dietary intake was assessed using a 2-day 24-hour dietary recall. The mean BMI of the respondents was 20.80 kg/m² (*SD*=3.16), with 31.3% underweight and 9.9% overweight. A majority of the respondents (95.4% males and 89.3% females) did not achieve the recommended energy intake. More than three-quarter of them did not meet the EAR levels for iron, calcium, vitamin D, folate and niacin. However, more than three-quarter of them met the EAR levels for zinc, vitamin A, vitamin C and riboflavin. Almost all (93.4% males and 95.7% females) of the respondents dissatisfied with their current body size and most of them desired a smaller body size (63.9% males and 68.6% females). High body image dissatisfaction ($\beta=0.245$), being a male ($\beta=0.301$), older age ($\beta=0.239$), high nutrition knowledge ($\beta=-0.153$), high carbohydrate intake ($\beta=0.187$), and fat intake ($\beta=0.157$) were significant predictors of BMI, which accounted for 35.1% of the variance in BMI. In conclusion, the prevalence of underweight was high among vegetarians. Most of them did not consume enough nutrients in their diet and dissatisfied with their current body size. Therefore, nutrition intervention should focus on healthy eating and body weight status as well as the promotion of positive body image among vegetarians.

A45 Dual forms of malnutrition among same household in Empat Lawang, South Sumatra, Indonesia

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Dual forms of malnutrition has been defined as the occurrence of both under-nutrition and over-nutrition together among mother-child pairs in same household. This cross-sectional study was conducted in several districts of Empat Lawang of South Sumatera province to determine the prevalence of malnutrition among both of mothers and child in same household and to determine the relationship of body mass index (BMI) of mother with child's nutritional status. Mothers were asked to answer a structured questionnaire to gather information on household socioeconomic and demographic status. Height and weight of mothers were measured to determine their BMI. Children's weights and heights were measured and converted into Z-scores using WHO ANTHRO Plus software to classify the children into stunting, underweight and overweight categories. Most of the mothers were normal (68.0 %), followed by underweight (8.5%), overweight (17.0%) and obese (6.5%) respectively. Average of weight-for-age, height-for-age and BMI-for age z-scores were -1.02 ± 3.06 , -1.14 ± 1.78 and -0.38 ± 5.16 respectively, which were in normal category. Anthropometric results showed that more than half of the children were normal (WAZ= 75.5%; HAZ= 66.5%; BAZ= 85.5%). The prevalence of severely underweight and underweight were 4.5% and 19.5% respectively, while 9.5% and 20.0% were severely stunted and stunted. Only 2.0% of the respondents were overweight. No significant correlation was found between mother's BMI and the anthropometric indices of the children. Dual forms of malnutrition could be an important indicator of household nutritional status among mothers-child pairs in the community.

A46 Relationships between familial factors with body weight status among Malay preschoolers in Tabika Perpaduan in Tanah Merah, Kelantan

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Parents play an important role in helping their children to achieve and maintain a healthy body weight status. This cross-sectional study aimed to determine the relationships between familial factors (infant feeding practices, parental feeding practices, and family food environment) with body weight status among Malay preschoolers in Tabika Perpaduan. A total of 258 Malay preschoolers (144 boys and 114 girls), with a mean age of 4.7 ± 0.6 years from 12 Tabika Perpaduan in Tanah Merah, Kelantan participated in this study. Mothers completed a self-administered questionnaire on sociodemographic background, infant feeding practices, child feeding practices and family food environment. Weight and height of the preschoolers were measured. Results showed that nearly one fourth of the preschoolers (22.5%) were wasted/thinness, 0.8% were severely wasted/severely thinness, and 3.1% were overweight. There was significantly association between sex of child and body weight status ($\chi^2 = 11.35$, $p = 0.003$). More boys (27.8%) were underweight as compared to girls (17.5%). There were significant correlations between child's age ($r = 0.188$, $p = 0.002$), perceived child's weight ($r = 0.154$, $p = 0.014$), concern about child's weight ($r = 0.127$, $p = 0.014$), pressure to eat ($r = 0.192$, $p = 0.002$), maternal control of child eating routines ($r = 0.152$, $p = 0.015$), child control of snacking ($r = 0.125$, $p = 0.045$) with BMI-for-age. Early introduction of any complementary food before 4 months showed significant association with body weight status ($\chi^2 = 14.10$, $p = 0.001$). In conclusion, about one in four of the preschoolers were underweight. This study shows the need for nutrition intervention programs to include familial factor in the promotion of healthy body weight status among preschoolers.

A47 Sociodemographic factors, food security, and health related quality of life among adolescents in Mentakab, Pahang

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Food insecurity is one of the worldwide nutrition concern found in both developed and developing countries. Child who live in food insecure household was reported to have frequent impaired health functioning outcome compared to their counterparts. Objective of this cross-sectional study was to determine the association between the sociodemographic factors with the food security status. Besides, this study also aim to compare the Health Related Quality of Life (HRQOL) based on the food security status and sociodemographic factors of the adolescents in Mentakab, Pahang. A total of 160 households that have a pair of mother and child aged 13-17 years old were selected. Face-to-face interviewed was done among the mothers to assess the food security status (Radimer/Cornell hunger and food insecurity instrument) and sociodemographic backgrounds of the household, while their child answered the self-administered questionnaire of HRQOL using PedsQL version 4.0. Weight and height of the adolescents were measured using TANITA weighing scale and SECA body meter, whereas 24-hour diet recall was used for the dietary intake determination. The findings indicates that 48.8% of the households were food insecure which comprised of household food insecurity (20.0%), individual food insecurity (13.8%), and child hunger (15%). Adolescents who from a family backgrounds of Malay, older maternal age, single-parents, less educated and unemployed parents, huge household size, and low income level were more likely to experience food insecurity and poor HRQOL ($p < 0.01$). Moreover, adolescents from food secure household had significantly mean higher of total HRQOL (76.03 ± 8.15) and BMI (21.278 ± 3.50) compared to adolescents from food insecure households ($p < 0.01$). In conclusion, sociodemographic factors and food insecurity status have a significant influences towards the Health Related Quality of Life of the adolescents. Hence, future intervention and assistance program should focusing more among the adolescents who live in food insecure and poor household.

A48 Association of sleep pattern with dietary intake and physical activity among Malay adolescents aged 10-14 years in Kuala Lumpur

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Many studies have linked sleep duration but not sleep pattern with dietary intake and physical activity. Thus, the aim of this study was to determine the association of sleep pattern with dietary intake and physical activity. A total of 140 Malay adolescents aged 10 to 14 years old were recruited from primary and secondary schools in Kuala Lumpur. Sleep pattern was assessed by Sleep Self Report (SSR) questionnaire which consists of three domains (bedtime, sleep behavior and daytime sleepiness) with 23 items where higher scores indicate lower sleep quality. Dietary intake was assessed using 3-day dietary record (3DDR). Physical activity was assessed by Physical Activity Questionnaire for Adolescents (PAQ-A) and pedometer. Anthropometric measurements included body weight, height and triceps and subscapular skinfolds. Mean body fat calculated from skinfold equation was $19.3 \pm 6.5\%$. Mean score of total SSR, bedtime, sleep behaviour and daytime sleepiness were 40.7 ± 5.7 , 1.8 ± 0.3 , 1.7 ± 0.4 and 1.8 ± 0.4 , respectively. Mean physical activity level was 1.94 ± 0.38 while mean pedometer step counts was 9765 ± 3891 per day. Mean daily intake of energy, protein, carbohydrate and fat were 1365 ± 308 kcal, 50.1 ± 21.6 g, 182.7 ± 47.4 g and 50.3 ± 15.4 g, respectively. Bedtime was negatively correlated with body fat ($r=-0.172$, $p<0.05$) but was positively associated with mean pedometer step counts ($r=0.187$, $p<0.05$). Positive association was found between sleep behaviour with energy ($\rho=0.207$, $p<0.05$), carbohydrate ($\rho=0.206$, $p<0.05$) and fat intakes ($\rho=0.219$, $p<0.01$). In conclusion, we found that sleep pattern was positively associated with dietary intake and physical activity. We opine that sleep pattern should be included in obesity interventions for adolescents so that the programmes may be more comprehensive and help improve practices and lifestyle.

A49 Nutritional status and health profile among single mothers in Kota Bharu, Kelantan

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The objective of this cross-sectional study is to determine the nutritional status and health profile of single mothers in Kota Bharu, Kelantan. A total of 100 single mothers aged 18-59 years old were involved in this study. Assessment of blood glucose (ACCU-CHEK Advantage), blood pressure (OMRON), height (SECA) and weight (TANITA) were done to each respondent. Food consumption based on the 24-hours diet recall was recorded and analyzed using Nutritionist Pro™ version 5.4.0 software. Results showed that the random blood glucose level of 82.0% single mothers was normal (within 4.4-8.0 mmol/L), 18.0% were exceeded 8.0 mmol/L although only 10.0% of them were diagnosed with diabetes based on clinical history. Meanwhile, 46.0% had normal blood pressure level, 21.0% were under pre hypertension stage, 17.0% under stage 1 hypertension and 11.0% under stage 2 hypertension. However, based on their clinical history, only 24.0% were diagnosed with hypertension. It was found that the mean weight of single mothers was 62.00 ± 12.61 kg, the mean height was 150.97 ± 20.25 cm while Body Mass Index (BMI) was 26.20 ± 4.99 kg/

m2. The result showed that 33.0% of the subjects have normal BMIs. 6.0% of them fall in the category of underweight, 39.0% were overweight and 22.0% were obese. Five percent (5.0%) of the subjects aged 19-29 years had meet 74.0% of the Recommended Nutrient Intake (RNI) of energy consumption for Malaysia, 57.0% aged 30-50 years achieved 70.6% of the RNI while 38.0% aged 50-59 years meet 69.5% of the RNI. This study indicate a high prevalence of overweight and obesity among single mothers and thus, it is suggested that future intervention programs should focus on preventing overweight and obesity problems related to chronic diseases.

A50 The T&Z Calorie Counter- A convenient, excel-driven tool to measure basal metabolic rate, physical activity level, total energy expenditure and moderate-to-vigorous physical activity in a single 24-hr recall

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The T&Z Calorie Counter is an excel-powered calculator of basal metabolic rate (BMR), physical activity level (PAL), total energy expenditure (TEE= BMR x PAL) and moderate-to-vigorous physical activity [MVPA: ≥ 3.0 Metabolic Equivalents (METs)]. The T&Z tool is based on the initial concept of Gerrior et al. (2000) but the following modifications have been made for use on Malaysians: a) BMR formula has been changed to that of Ismail et al. (1998); b) some MET values have been modified to suit Malaysians; c) a correction incorporated for missed habitual MVPA. The excel-driven calorie counter is based on a one-off face-to-face interview with the subject assessed. The T&Z tool comes with Instructions for the user:

- 1) Enter the respondent's name, gender, age, weight (kg) and height (metres) in the respective boxes (\rightarrow BMI is automatically calculated).
- 2) Click on Gender/Age at **Box C24**. Next, click at right of this box for drop-down panel and select appropriate gender and age (\rightarrow BMR is automatically calculated and shown in Box E26).
- 3) Interview the respondent on his/previous day's physical activities (PA) from the time he woke up, starting from the top of the excel programme (Leisure Time PA: Exercise and Sports) and work downwards through "Domestic/Gardening Activities", "Work-related PA", and "Transport-related PA". Be careful to enter the actual duration of each PA (minutes) in **Column F**. Do NOT record duration for sleeping and sitting/lying still.
- 4) Do correction for habitual MVPA missed using the Panel on the right, if applicable.
- 5) That's it- you should take a total of only about 10-15 minutes.

The T&Z tool has been previously evaluated (Lee BN & Mok YK. BSc Honours Dietetics with Nutrition Thesis, IMU, 2013) and was used in several IMU research projects under the supervision of the present author. In addition, the T&Z tool has the following advantages:

- a) Suitable for use in nutrition surveys where meeting with respondent is one-off.
- b) Automatically calculates BMR, PAL, TEE and MVPA/day or MVPA/week which obviates the need for tedious calculations.
- c) Reduces respondent bias or burden inherent with tools which require self-reported PA over a number of days or PA records for numerous short-periods throughout the day.

A51 Knowledge, attitude and practices (KAP) on nutrition and oral health: an association with early childhood caries (ECC) and nutritional status of children attending private TASKA in Kota Bharu, Kelantan

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The objective of the study is to investigate the association between knowledge, attitude and practices (KAP) on nutrition and KAP on diet and oral health of mothers with nutritional status (weight-for-age (WAZ), height-for-age (HAZ), BMI-for-age) and caries status (dmft) of their children aged 2-5 years old. This was a cross sectional study of 126 subjects from 8 private TASKA in Kota Bharu, Kelantan. Tools using for this study were questionnaires of KAP on nutrition and on diet and oral health, anthropometric measurements and oral health measurement. Majority of the parents were from high socioeconomic status with the median monthly household income of RM4000.00. The results indicated that 1.6% of preschool children were severe underweight and 13.5 % were underweight. About 4.0% and 10.3% of them were severe stunted and stunted respectively. The nutritional status of BMI-for-age indicated that 1.6% of them were severe thinness and 15.2% were thinness. Besides, only 2.4% and 4.8% of them were overweight and obese respectively. Furthermore, the results also indicated that the preschool children who have no or low (dmft \leq 3) caries were 31.0%. For the assessment of KAP on diet and oral health, most of the mothers have moderate knowledge (61.1%) and attitude (66.7%) while most of them have high practices (64.3%). For the assessment of KAP on nutrition, most of the mothers have high knowledge (75.4%) and attitude (84.1%) while most of them have moderate practices (56.3%). Maternal attitude and maternal knowledge on diet and oral health was associated with caries status ($r=-0.183$, $p<0.05$) and indicator of BMI-for-age ($r=-0.190$, $p<0.05$) respectively. For nutritional status, indicator of HAZ was significantly correlated with caries status ($r=0.185$, $p<0.05$). As conclusion, there were significant correlation between maternal attitude and maternal knowledge on diet and oral health with early childhood caries and BMI-for-age respectively.

A52 Is body shape index a better predictor of blood pressure than body mass index and waist circumference in Malay children and adolescents?

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Studies have shown that elevated blood pressure (BP) is associated with childhood obesity; and A Body Shape Index (ABSI) has been shown to be an important measure of disease risk. This paper aims to examine whether ABSI is a better predictor of BP than BMI and WC in Malay children and adolescents. A total of 409 subjects (209 boys, 200 girls) aged 9 to 14 years were recruited from national schools in Kuala Lumpur using multistage sampling. Body weight, height, waist circumference and blood pressure were assessed. BMI was calculated as body mass (kg) divided by height (m) squared, and ABSI was calculated as WC divided by BMI^{2/3} and height^{1/2}. Mean age, weight, height, BMI and WC were 12.1 \pm 1.6 years, 43.1 \pm 15.4 kg, 146.3 \pm 11.4 cm, 19.7 \pm 5.2 kg/m², and 62.5 \pm 13.3 cm, respectively. BMI and WC were moderately correlated to systolic blood pressure, SBP (BMI: $r=0.519$; WC: $r=0.383$)

and diastolic blood pressure, DBP (BMI: $r=0.443$; WC: $r=0.290$) after adjusting for sex and age ($p<0.001$). ABSI was found to be weakly correlated to SBP ($r=0.150$, $p<0.05$) and DBP ($r=0.118$, $p<0.05$). Regression analysis found that BMI, WC and ABSI could significantly predict BP ($p<0.001$). However, BMI was a better predictor of SBP (adjusted $R^2=0.308$, $F_{1,408}=182.4$, $p<0.001$) and DBP (adjusted $R^2=0.196$, $F_{1,408}=100.6$, $p<0.001$) compared to WC and ABSI. We conclude that ABSI was not better than BMI and WC at predicting BP in Malay children and adolescents. However, further research that tracks subjects for longer periods may demonstrate that ABSI could be a predictor of long-term BP.

A53 Factors associated with gestational weight gain among pregnant mothers attending health clinics in Batu Pahat, Johor

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This cross sectional study aimed to determine the factors associated with gestational weight gain (GWG) among pregnant mothers attending seven selected health clinics in Batu Pahat, Johor. Total of 207 healthy Malaysian pregnant mothers with singleton pregnancy, in second (36.2%) or third trimester (63.8%) were interviewed. The prevalence of inappropriate GWG was high, 55.0% inadequate GWG and 18.4% excessive GWG. One in four of the respondents (23.7%) had monthly household income less than RM 1500 while another quarter (27.0%) earned more than RM 3000 monthly. Five percent of the respondents exposed to secondhand smoke at home and workplace. Their physical activity level was about equally distributed between sedentary to light (58.0%) and moderate to vigorous (42.0%). Majority (87.0%) took less than 3 servings of meat and alternatives. Their mean pre-pregnancy BMI was 23.48 ± 4.83 kg/m². Respondents with household income less than RM 1500/month were prone to experience excessive GWG (26.6%) while those earned more than RM 3500/month were prone to gain weight inadequately (64.3%) ($X^2=9.787$, $p<0.05$). Respondents were more likely to have inadequate GWG if they exposed to secondhand smoke at home and workplace (80.0%) ($X^2=13.606$, $p<0.05$). Respondents in moderate to vigorous activity levels had higher tendency to experience inadequate GWG (64.4%) while practicing sedentary to light activity were prone to gain weight excessively (23.3%) ($X^2=6.539$, $p<0.05$). Respondents took less than 3 servings of meat and alternatives were tend to have inadequate GWG (58.9%) ($X^2=10.021$, $p<0.05$). Pre-pregnancy BMI of respondents with inadequate GWG (22.47 ± 3.94 kg/m²) was lower than sufficient (23.64 ± 6.25 kg/m²) and excessive GWG (26.27 ± 6.25 kg/m²) ($F=9.534$, $p<0.05$). In short, more than half of the respondents experienced inappropriate GWG with majority had inadequate GWG. Determining socio-demographic characteristics, lifestyle behaviors and pre-pregnancy BMI are important while planning antenatal nutrition care and management.

Group E: Food Science and Technology

E01 Morphological characteristics and textual properties of chiffon cake incorporated with different particle size of young corn powder (YCP)

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Normally, dietary fiber-enriched bakery products have a less desired harder texture. The effects of different particles size of YCP added into chiffon cake on the morphological characteristics and textural properties as well as the sensory attributes were investigated in attempt to improve the texture, thus the final quality of chiffon cake. Young corn powder (YCP) with different particles size (45, 125 and 250 μm) was added into the chiffon cake formulations. Morphological differences were observed between the cake samples. Chiffon cake incorporated with 45 μm YCP showed coarser crumb morphology, more loosed structure, larger and irregular air cell sizes distribution as compared to morphology of chiffon cake prepared with 125 μm YCP that are more evenly distributed smaller air cell sizes. The additional of different particle size of YCP into the chiffon cake did not show any predicted trend exhibited by all textural attributes of the chiffon cakes. The textural profile analysis revealed that the chiffon cake incorporated with 45 μm YCP has the greatest hardness. Addition of 45 μm YCP also resulted in the highest chewiness and gumminess among all the chiffon cake samples. Chiffon cake prepared with 125 μm YCP remains the more desired choice in term of hardness. Meanwhile, all textural attributes of chiffon cake does not differ significantly from each other. Apart from that, results of sensory evaluation indicated that chiffon cake formulated by the incorporation of 250 μm YCP score the highest value for all sensory attributes except for the colour. Meanwhile, the chiffon cake formulated by using 45 μm YCP score the lowest in most of the sensory attributes except for texture and springiness. In a nutshell, increasing or decreasing the particle size of the YCP incorporated into chiffon cake does not affect the texture of the chiffon cake.

E02 Modification of phosphorus-to-protein ratio in fresh chicken meat and chicken meat products through different cookings

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Chronic kidney disease (CKD) patients are highly recommended to restrict their dietary intake to avoid over consumption of phosphorus. However, foods high in protein contain high amount of phosphorus, attribute to high risk of protein energy malnutrition (PEM) in CKD patients. The goal of this study is to determine the appropriate cooking methods to reduce phosphorus-to-protein ratio (p:p) in chicken breast meat and chicken meat products. Chicken breast meat and three types of chicken products (meatball, frankfurter and patty) were selected. Frying, grilling, 10 minutes boiling and 20 minutes boiling were used to cook the food samples. Each sample raw and cooked was carried out duplicate for analysis (total 40 samples). Protein content of samples were analyzed by using Kjeldahl's method while phosphorus content of samples were analyzed by dry ashing method followed by inductively coupled plasma-optical emission spectrometer (ICP-OES). Protein content in all cooked samples was higher than the raw samples. There were significant differences in phosphorus content of samples cooked using different methods. Losses of phosphorus in boiled samples were higher than those samples cooked by other methods. Overall, boiling method have lower p:p than frying and grilling methods. Boiling for 20 minutes lead to the lowest p:p in all food samples. Boiling method was found to increase protein content while decreasing phosphorus content, therefore boiling is the most appropriate cooking method to lower p:p. Besides that, chicken breast meat is better to be consumed due to its lowest p:p ratio among all samples. Appropriate cooking method together with food choices are essential in reducing bunch of phosphorus, reducing risk of PEM and optimizing dietary management in CKD patients.

E03 The effect of avocado as fat replacer on the physical and sensory attributes of chocolate cupcakes

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Avocado contains a variety of essential nutrients such as monounsaturated acid and important phytochemicals such as carotenoid, phenolics and phytosterol. The buttery texture of avocado makes it excellent fat replacer in baked products. Cupcake bakeries has been growing in popularity since the past few years. The consumption of cupcake is increased and thus, there is opportunity to better improve the nutrient profile of cupcakes. The purpose of this study was to study the effect of local avocado puree as fat replacer on the physical and sensory properties of chocolate cupcake. In each cake formulation, the amount of butter used was substituted with 25%, 50% and 75% of avocado puree. The results show that incorporation of avocado puree did not affect the height and specific volume of the chocolate cupcakes. The batter specific gravity of the cakes significantly increased ($P < 0.05$) with increasing level of avocado puree. There were no significant different ($P > 0.05$) in the colour attributes for lightness, redness and yellowness values between control sample and all of the fat-replaced cakes. The texture profile analysis shows that addition of butter with avocado puree did not affect the hardness and springiness of the cakes. The cohesiveness, chewiness and gumminess of the cakes increased significantly ($P < 0.05$) starting at 50% level. The sensory evaluation results indicate that the colour and aroma of the chocolate cupcakes prepared with avocado puree and control cake were equally accepted. However, the attributes for taste, tenderness, and moistness shows a decreasing trend of acceptance in comparison with the control sample. Nevertheless the overall acceptance of all fat-replaced chocolate cupcakes were equally accepted as the control sample. In conclusion, the replacement of butter with avocado puree in chocolate cupcake affects some of its physical properties but generally accepted in terms of sensory analysis.

E04 Determination of proximate and mineral contents of chocolate cupcakes prepared with *Persea americana* fruit as fat replacer

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Replacing fat in baked products with fruit based ingredients can aid in the overall reduction of fat intake and increase the consumption of fruits. Avocado (*Persea americana*) fruits contain high monounsaturated fat and various phytochemicals such as carotenoids and phenolics. Consumption of cupcakes has been increasing and becoming a trend since the past few years. Thus, there is an opportunity to better increase the nutritional quality of cupcake to better improve the nutritional status of community. Thus, a study was conducted to determine the macronutrients and mineral contents of chocolate cupcake prepared by replacing butter with avocado puree. Chocolate cupcakes were prepared by using pureed avocado (0%, 25 %, 50%, and 75%) in place of butter. Proximate analysis was determined by using standard AOAC method. Mineral content was determined by using atomic absorption spectrophotometry. The results were analyzed by using SPSS (version 20.0) software. The results show that the mean values of moisture, protein and fat contents were significantly different ($P < 0.05$) among the four samples. The moisture increased significantly ($P < 0.05$) with the increase in percentage of avocado puree. The

highest protein content was found in 75% fat-replaced sample (10.87 g/100g) while the control sample (9.19 g/100g) contained the lowest protein. As the percentage of avocado increased, the fat content was significantly decreased ($P < 0.05$) in all fat-replaced samples. The 75% fat-replaced sample (8.33 g/100g) contained 63% less fat than the control sample (22.74 g/100g). There were no significant different in the ash and carbohydrate values. The mineral contents show that sodium, potassium, magnesium and zinc were highest in the 25% fat-replaced sample. As a conclusion, the production of chocolate cupcakes prepared with avocado puree as fat replacer enhanced its nutritional composition with the increase in protein and minerals and decrease in fat content.

E05 Encapsulation of *Lactobacillus acidophilus* in tropical fruit juices

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Probiotics have received increased attention due to the range of health benefits it provides. However, as it is mostly available as dairy-based foods, it may not be a suitable food for those with lactose intolerance and milk protein allergy. Fruit juice is proposed to be an alternative to deliver probiotics, but the low pH condition in fruit juice may not be favourable for the growth of probiotics. Encapsulation is used to provide a barrier to protect the probiotics. This study was conducted to evaluate the effects of encapsulation on the viability of probiotics in 12 different conditions with varying alginate concentration ('free', 1.5% and 2%), type of juice (mango and pineapple) and pH (3.5 and 4). *Lactobacillus acidophilus* ATCC 314 was microencapsulated in alginate beads produced by extrusion. The beads were stored in fruit juice for four weeks. The viability of probiotic was assessed by total plate count and confocal laser scanning microscopy, while the integrity of the alginate beads was assessed by scanning electron microscopy (SEM). At the end of week 4, the viability was $3.00 \pm 0.03 \log_{10}$ CFU/mL for pH 3.5 mango juice with free cells; no growth for pH 4 mango juice with free cells; $5.79 \pm 0.07 \log_{10}$ CFU/mL for pH 3.5 pineapple juice with free cells; and $3.57 \pm 0.13 \log_{10}$ CFU/mL for pH 4 pineapple juice with free cells. All microencapsulated probiotic of both alginate concentrations did not exhibit any growth in total plate count, but were observed to be viable when viewed under confocal laser scanning microscopy. SEM revealed the presence of cracks and pores present on the surface of the alginate beads. While all probiotic cells may be viable at the end of the four weeks, the effects of microencapsulation on the viability of *Lactobacillus acidophilus* over four weeks could not be compared effectively, between free and microencapsulated cells, due to the unavailability of data from bacterial enumeration.

E06 The effect of different cooking techniques on physical and sensory properties of oyster mushroom and its application in beef patty

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The inheritance of Malaysian food is frequently driven by international influences which cause Malaysia to rely on imports of red meat. The utilization of non-meat-based substitute such as mushroom to the patty formulation is potentially practical since it contain various nutritive values. The effect of different cooking techniques on physical and sensory properties of oyster mushroom and its application in beef patty were investigated. Result shows beef patty replaced with raw oyster mushrooms (control), recorded the highest cooking yield

(85.40%). On the other physical traits, beef patty which was replaced with blanched oyster mushroom (BOM), recorded the highest moisture retention (33.32%). However, the fat retention was not significant ($p>0.05$) for all treatments. The color analysis of beef patty substitute with 25% of steamed oyster mushrooms (SOM) is brighter as it had higher L^* (lightness) value compared with raw beef patty substitute with BOM but less brightness compared to the control patty. Beef patty substituted with BOM recorded the lowest a^* value (redness) compared to beef patty substituted with SOM and control, respectively. Meanwhile, beef patty substituted with SOM recorded the highest b^* value (yellowness) compared to beef patty substituted with BOM and control, respectively. Sensory evaluation of the products revealed significant ($p<0.05$) differences for color, juiciness, flavor, overall acceptance attributes. Conversely, the products had no significant ($p>0.05$) effect on aroma and tenderness attributes. The score for color of beef patty substituted with SOM was not significantly different ($p>0.05$) from the control. In summary, different cooking techniques applied to the oyster mushroom before substituted in the beef patty did not jeopardize several physical properties and sensory properties attributes.

E07 Effect of cooking on total polyphenol content and antioxidant capacities of mix spices cooking pastes in Malaysia

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Mix spices cooking paste has gained much popularity in Malaysia due to its convenience for preparing certain local cuisine such as Kari Ayam and Rendang. The cooking paste contains different combination of herbs and spices that was thermally processed to enhance its shelf life. Seven types of mix spices cooking pastes found in Malaysia market were analyzed for their total polyphenol content and antioxidant capacities, in addition to the effect of cooking on these parameters. The total polyphenol content (TPC) were determined by Folin-Ciocalteu method, and the antioxidant capacities were evaluated by DPPH free radical scavenging assay, ferric reducing antioxidant power (FRAP) assay and ABTS free radical scavenging assay. Results from the analyses were expressed as the mean of brands analyzed and in dry weight. Total polyphenol content of the cooking paste samples ranged from 246.25 ± 75.61 mg GAE/100g to 370.57 ± 69.74 mg GAE/100g. Antioxidant capacities determined ranged from 728.54 ± 231.62 $\mu\text{mol TE}/100\text{g}$ to 1267.66 ± 235.12 $\mu\text{mol TE}/100\text{g}$ for DPPH assay, 1247.15 ± 344.00 $\mu\text{mol TE}/100\text{g}$ to 1886.89 ± 352.78 $\mu\text{mol TE}/100\text{g}$ for FRAP assay and 833.19 ± 324.99 $\mu\text{mol TE}/100\text{g}$ to 1589.40 ± 381.17 $\mu\text{mol TE}/100\text{g}$ for ABTS assay. Results showed that the process of cooking caused an increase on the TPC and antioxidant capacities of cooking paste samples, with Rendang paste showing the highest increment of TPC (21.48%) and antioxidant capacities (24.26%-49.66%). A positive correlation were found between TPC and DPPH assay ($r=0.545$), TPC and FRAP assay ($r=0.840$) and TPC and ABTS assay ($r=0.623$). These results indicated that mix spices cooking paste can be an important source of polyphenols and antioxidants in Malaysian diet. Further investigations on the active compounds in the cooking pastes are needed to determine the bioavailability and effect of these compounds in human.

E08 Effects of drying method on phenolic content and antioxidant activity of papaya fruit

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Papaya (*Carica papaya* L. cv Eksotika) is one of the most commonly consumed tropical fruits by humans, especially Malaysians. The objective of this study was to evaluate the effect of different drying methods (hot-air drying and freeze dried) on the antioxidant activity and phenolic content of papaya fruits (Eksotika L.). Papaya fruits were selected and classified based on their visual maturity (ripe stages). The drying of the papaya fruit was done in the middle section of the cabinet dryer, which had been preheated to 60 for 48h. The antioxidants activity were analyzed using the total phenolic content (TPC), ferric reducing antioxidant Power (FRAP) and 2,2-diphenyl-1-picrylhydrazyl (DPPH). The analyses were conducted in triplicate and the data were subjected to statistical analysis using SPSS. Results showed that antioxidant activity and phenolic content were affected by the drying methods. Freeze drying sample possessed the highest phenolic content 52.81 mg GAE/100g DW and antioxidant activity FRAP 172.45 mg TE/ 100g DW, DPPH 67.41 %. Hot-air drying samples were the worst in phenolic content 46.10 mg GAE/100g DW and antioxidant activities (FRAP 163.08 mg TE/ 100g DW and DPPH 58.26%. Significantly positive correlation was found between the total phenolic content and antioxidant activity FRAP and DPPH 0.92 and 0. Therefore, it could be suggested that freeze dried is comparatively a better means to dry fruits retaining maximum amounts of antioxidant compounds.

Group F: Experimental Nutrition

F01 Maintenance of vitamin D status in zucker diabetic fatty rats by dietary resistant starch is dependent on kidney health and serum adiponectin levels

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Diabetic nephropathy increases the risk for vitamin D (VD) deficiency due in part to the role of kidney in maintaining circulating 25-hydroxycholecalciferol (25D) concentrations. We previously reported that high-amylose maize that is partially resistant to digestion (RS) protected kidney health and maintained VD status in Zucker diabetic fatty rats (ZDF), an experimental model of type 2 diabetes. Here, we further investigated the minimal effective dose of RS and the mechanism underlying the kidney protection in RS-fed ZDF rats. Lean Zucker rats (n=5) were fed control diet (LC); ZDF rats (n = 5/group) were fed either control diet (DC), diet containing 10% RS (LRS), or diet containing 20% RS (HRS) for 6 weeks. Consistent with our previous findings, neither HRS nor LRS attenuated blood glucose levels and hemoglobin A1c % in ZDF rats. However, HRS, but not LRS, improved vitamin D status and attenuated urinary loss of vitamin D metabolites in ZDF rats. Serum triglycerides were 50% lower in HRS compared to DC, despite a 2-fold increase in liver triglycerides.

Interestingly, circulating adiponectin was 77% higher in HRS, but no difference in LRS, compared to DC, and that it was strongly correlated to kidney health and vitamin D status. Similarly, serum angiotensin II, a major component of the renin-angiotensin system, in HRS was 44% lower than in DC, but no change was detected in LRS. LRS did not exhibit similar protective effect in ZDF rats as in HRS, suggesting that the optimal RS dose is between 10% and 20% of RS. For the first time, we demonstrated that the regulation of vitamin D homeostasis and renoprotection by RS could be driven by adiponectin-mediated suppression of angiotensin II. This may further support the potential of resistant starch as a dietary intervention to prevent the progression of diabetic-induced kidney injury.

F02 Comparative anti-proliferative effect of crude extract of bitter melon's (*Momordica charantia*) seeds and pulp on human colon cancer (HT-29) cell line

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Colorectal cancer, being the third most commonly diagnosed cancer worldwide and second most common cancer in Malaysia had created a great concern. For years, fruits and vegetables have been the interest for their possible favorable influence on the risk of different cancer and other diseases. Treatments derived from natural sources also believed to pose minimal side effects in comparison to those conventional treatments available. This study was aimed to investigate and compare the anti-proliferative effect of crude extract of *Momordica charantia*'s (MC's) seeds and pulp on human colon cancer (HT-29) cell lines. Samples of seeds and pulp powder were extracted twice using distilled water and 95% ethanol separately, with shaker at 150 rpm for 24 hours. The aqueous extracts were freeze-dried while the ethanol extracts were evaporated to dryness at 45°C. The anti-proliferative effect of the extracts was determined using MTT (3-(4,5-dimethylthiazolyl-2)-2,5-diphenyltetrazolium bromide) assay. The HT-29 cell line was seeded in 96-well microtiter plates with density 1×10^5 cells/ml in each well. Then, different concentration of the extracts (3.13 - 200.00 µg/ml) was added and incubated for different periods (24, 48 and 72 hrs). Results showed that aqueous MC's seeds extract registered the lowest IC₅₀ value (74.59 µg/ml) for HT-29 cell lines, followed by ethanol MC's pulp extract (106.30 µg/ml), ethanol MC's seeds extract (118.40 µg/ml) and aqueous MC's pulp extract (129.10 µg/ml) at 72 hrs of incubation. The correlation between different concentrations of extracts and percentage of cell viability was significant and in dose-dependent manner. The bioactive compounds present in the extracts were identified using LCMS/MS. Some compounds including ellagic acid, ascorbic acid and hydroxylatedcinnamic acid which shown to have anti-cancerous properties were detected. These outcomes suggested that purification or fractionation of compounds identified in extracts should be done to further assess its anti-proliferation activity on colon cancer.

F03 Pasting profiles of composite flour blends with cornlettes

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Biodiversity for food and agriculture is central in sustaining humankind on earth, and most strategic to fight the formidable challenges of food and nutrition insecurity, poverty, and climate change. Plant – based foods becomes major food source since ages, thus the production of it is crucial. Thus underutilized plant is used to maximizing its usage as well as to accommodate the demands of food production. This study aimed to partially replaced

and substitute imported wheat flour with composite flour contains cornlettes powder as main ingredients in food products. Composite flour was prepared using cornlettes powder (CP) added in wheat flour (WF) with the proportion of 10:90, 20:80, 30:70 and 100:0% (CP:WF). Composite flour starch extraction was prepared using alkaline isolation method. The present study aims to investigate pasting profiles of composite flour blends with cornlettes. The results show that amylose content was significantly different ($P < 0.05$) among five samples. Amylose contents significantly increased ($P < 0.05$) when the percentage of cornlettes powder in composite flours is increased. The highest amylose content was found in 100% percentage sample (4.40g/20g) while the lowest amylose content can be found in control sample (0.072g / 20g). There were no significant difference between moisture, thermal properties and swelling power values. Scanning electron micrographs of the composite flour clearly show the presence of starch granules with similar size and shape in all samples. As a conclusion, composite flour blends with cornlettes can be used to partially replace wheat flour in order to meet the functionality and demands of food production.

F04 Cytotoxic effect of extracts of *Centella asiatica* (pegaga) and *Cosmos caudatus* (ulam raja) on colon cancer (HT29) cell line

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Cancer is one of the major causes of death worldwide which accounts for 8.2million deaths in 2012. The usual treatment of cancer normally caused nausea, fatigue, hair loss and other symptoms. Now there is growing interest in the role of natural plant for cancer treatment with minimal side effect. The objective of this study was to investigate the cytotoxic effect of *Centella asiatica* (CA) and *Cosmos caudatus* (CC) extracts on colon cancer (HT29) cell line. Mouse fibroblast (3T3) cell line was used as a control. Water and 95% of ethanol were used for the extraction procedure for both samples. The cytotoxic effect of different concentration of the extracts (3.13-200 $\mu\text{g/ml}$) on HT29 and 3T3 were determined using MTT (3-(4,5-dimethylthiazolyl-2)-2,5-diphenyltetrazolium bromide) assay. The morphology changes and the mode of the cell death were examined under inverted light microscope and inverted fluorescence microscope using acridine orange and propidium iodide (AOPI) staining, respectively. Results from MTT assay after 48 hours of incubation, revealed that HT29 cell line was most sensitive to ethanol extract of CA as $\text{IC}_{50} = 38.97 \mu\text{g/ml}$. For CC, only aqueous extract showed weak cytotoxic effect on HT29 as $\text{IC}_{50} = 135.98 \mu\text{g/ml}$. Other extracts did not show any cytotoxic effect on HT29. All the extracts also did not show any cytotoxicity against 3T3 cell line. Observation on morphology indicated that ethanol extract of CA induced typical characteristics of apoptosis in HT29, including chromatin condensation, nuclear fragmentation and membrane blebbing. One possible mechanism on how the CA can induce cytotoxic effect is through its high antioxidant activity as shown by many previous studies. Results of this study suggested that ethanol extract of CA might has potential therapeutic effect on colon cancer cell without giving any adverse side effect on normal cells. However, further investigation is required to confirm the finding.

F05 Morphological characterizations and physicochemical property of bun formulated with different particle size of cornlettes (*Zea mays* L.)

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Cornlettes or immature corn which is one of the commonly consumed vegetable by Malaysian populace contains high dietary fiber in dried form. Presently, cornlettes have been

introduced in enhancing nutritional qualities of baked-based products. This study aims to investigate the influence of different particle size (45, 125 and 250 μm) of cornlettes on the quality of bun which covering morphological characterization, physicochemical, textural property and sensory evaluation. Scanning electron microscopical observation showed that at higher magnification, there are compact particles of wheat flour and dietary fibers especially bun formulated with larger particle size of cornlettes. In addition, microstructure of cornlettes with oily particles intact were clearly seen. Dietary fiber of cornlettes was seen able to absorb fat molecules. For texture profile analysis (TPA), as particle size increases (45, 125 and 250 μm), the decreasing of firmness (1.45 kg to 1.32 kg), gumminess (1.74 kg to 0.98 kg) and chewiness (1.74 kg to 0.98 kg) compared to control were observed. In sensory evaluation, bun formulated with 250 μm particle size of cornlettes was preferred by sensorial panellists eventhough not significant with other treatments. Among 3 different particle sizes of cornlettes added in bun formulation, bun added with 250 μm particle size of cornlettes resulted as less firmness (1.32 kg), gumminess (0.98kg) and chewiness (0.98kg) compared to other treatments. In brief, bun added with 250 μm particle size of cornlettes is recommended in the preparation of high fibre and palatable bun.

F06 *In vitro* and cellular bioactivity of *Eucheuma denticulatum* (N.L. Burman) F.S. Collins and Hervey for putative type 2 diabetes management

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Seaweed contains an abundance of bioactive compounds with huge biomedical potential. The objective of this study was to evaluate the local seaweed extracts for α -amylase inhibitory effect and other potential bioactivity properties for type 2 diabetes management. *E. denticulatum* ethanol extract and fractions were subjected to α -amylase analysis. The observed effects were associated with antioxidant activity of the extracts and downregulation of immunomodulatory markers related to insulin resistance. Alpha-amylase inhibitory activity was assessed by Dinitrosalicylic acid (DNS) assay, while the antioxidant property was determined by oxygen radical absorbance capacity (ORAC) analysis. The anti-inflammatory effects of the seaweed samples were evaluated by nitric oxide (NO), Interleukin-6 (IL-6), Interleukin-1 (IL-1), Tumor Necrosis Factor-alpha (TNF- α) and macrophage chemoprotectant-1 (MCP-1) activities on the interferon- gamma/ lipopolysaccharide (IFN- γ /LPS) stimulated murine macrophage cell line (RAW264.7) using Griess reaction and Immunoassays. The investigated seaweed crude extract and three fractions exert α -amylase inhibitory activities at variable levels. The highest (67%) inhibition of α -amylase enzyme was by the ethanol crude extract. Hexane, ethyl acetate and acetone fractions showed inhibition with a mean of 42%. Crude ethanol extracts also exhibited higher antioxidant capacity (36 400 μmol Trolox equivalent (TE)/100 g) when compared to the fractions. Both the crude extract and fractions, also exhibited anti-inflammatory activity without showing any cytotoxic effect to RAW264.7 cells. This study suggests that *E. denticulatum* has the potential to be a promising source of effective functional metabolites.

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

Group B: Dietary Intake, Consumption Pattern and Diseases

B01 Comparison of dietary intake among pre-menopausal and post-menopausal newly-diagnosed breast cancer patients at Hospital Universiti Sains Malaysia (HUSM)

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The objectives of this study were to compare the dietary intake of pre-menopausal and post-menopausal newly diagnosed breast cancer patients and to compare both groups dietary intake with Recommended Nutrient Intake (RNI) 2005. This cross sectional study took place in Oncology Clinic, Hospital Universiti Sains Malaysia (HUSM). A total of 70 newly diagnosed breast cancer patients aged 30-59 years old were interviewed using standard questionnaires which consists of socio-demographic items, medical history and validated diet history questionnaire (DHQ). DHQ data was analysed using Nutritionist-Pro™ software. Out of 70 patients, 47 patients (67.7%) were classified as pre-menopausal women while another 23 patients (32.3%) were classified as post-menopausal women. Dietary assessment found that the mean \pm SD energy intake of pre-menopausal and post-menopausal women was 1415.41 \pm 342 kcal/ day and 1357.43 \pm 263 kcal/ day, respectively. Energy intake achieved in pre-menopausal and post-menopausal women was 64.9% and 62.2% of the RNI. Statistical analysis shows no significant difference in the dietary intake between pre-menopausal and post-menopausal women. The mean energy percentage from carbohydrate, fat and protein among the pre-menopausal women were 61%, 15% and 23%, respectively. It was found to be almost similar to the post-menopausal women's energy percentage from the above mentioned macronutrients. In both groups, micronutrients that did not met the Malaysian RNI were calcium, iron, zinc, selenium, thiamine, riboflavin, niacin, folate, vitamin C and vitamin E. Only Vitamin A intake in pre-menopausal women (123.9%) and post-menopausal (149.8%) women achieved the RNI. This study highlights the presence of inadequate nutrient intake among newly diagnosed breast cancer patients. Therefore, an appropriate strategy to educate newly diagnosed breast cancer patients is crucial to help patients achieve an optimum nutritional status during cancer treatment.

B02 Factors associated with disordered eating behaviours among male adolescents in Sepang, Selangor

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This cross-sectional study determined factors associated with disordered eating among 187 male adolescents in Sepang, Selangor. BMI, waist circumference, body image, psychological factors, sociocultural influences, eating patterns and disordered eating were assessed using Anthroplus, non-extensible tape, Contour Drawing Rating Scale, Depression, Anxiety and Stress Scale, Sociocultural Influences on Body Image and Body Change Questionnaire, Modified Youth Risk Behavior Surveillance Questionnaire and Eating Attitude Test respectively. The mean age of the adolescents was 14.56±1.05 years. Overall, 57.2% of the adolescents were Malay, 24.1% Indian, 13.9% Chinese and 4.8% Others. The average monthly household income was RM3139.28±2444.68. The prevalence of overweight and obesity, thinness and severe thinness, abdominal obesity and disordered eating were 31.6%, 8.1%, 21.9% and 26.7% respectively. Around 29.4% were incorrect estimators of body weight whereas 76.0% were dissatisfied with body size. Around 9.7%, 21.4% and 8.5% of the respondents were severe and extremely severe in depression, anxiety and stress respectively. The mean scores of perceived pressure to lose weight and gain muscles were highest by media and peers respectively. Monthly household income ($r=-0.153, p<0.05$), fruit intake patterns ($r=0.209, p<0.01$), perceived pressure to lose weight by father ($r=0.512, p<0.001$), mother ($r=0.481, p<0.001$), peers ($r=0.526, p<0.001$) and media ($r=0.394, p<0.001$), perceived pressure to gain muscles by father ($r=0.485, p<0.001$), mother ($r=0.476, p<0.001$), peers ($r=0.349, p<0.001$) and media ($r=0.357, p<0.001$), depression ($r=0.196, p<0.01$), anxiety ($r=0.163, p<0.05$) and stress ($r=0.193, p<0.01$) were significantly associated with disordered eating. Multiple linear regression analysis showed six factors, namely perceived pressure to lose weight by peers, perceived pressure to gain muscles by father, being Indian, perceived pressure to lose weight by father, monthly household income and fruit intake patterns were predictors of disordered eating explaining 47.0% of the variance. In conclusion, planning for intervention programs targeting disordered eating among male adolescents should take these factors into consideration.

B03 Do fruit and vegetable consumption differ in their associated factors?

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The prevalence of inadequate consumption of fruit and vegetable has becoming a common problem in developed and developing countries. A cross-sectional study was conducted in 13 randomly selected preschools in Kuantan to examine the factors associated with low consumption of fruit and vegetable among preschoolers. A total of 240 preschoolers (137 boys and 103 girls) with a mean age of 5.11 ± 0.62 years participated in this study. A self-administered questionnaire assessing personal characteristics, infant feeding practices, maternal feeding practices, and food neophobia was completed by their mothers. Fruit and vegetable consumption was measured using a self-administered questionnaire on frequency and a 3-day food record was recorded on the number of serving of consumption. Majority of the preschoolers consumed fruit (85.9%) and vegetable (75%) less than once per day. The means consumption of fruit and vegetable were 0.63 ± 0.51 and 1.30 ± 0.91 serving respectively. Of 240 preschoolers, 96.7% and 94.2% did not consume the recommended 2 servings of fruit and vegetable daily, respectively. Some (15.8%) were classified as food neophobia. Mother's age ($\chi^2=15.044, p=0.001$) and level of education ($\chi^2=6.515, p=0.011$) were associated significantly with fruit consumption but not vegetable consumption. Mother's use of autonomy promoting practices of involvement ($r=-0.145, p=0.024$) and teaching about nutrition ($r=-0.143, p=0.027$) were negatively associated with vegetable consumption but not fruit consumption. Besides, duration of exclusive breastfeeding was positively correlated with vegetable consumption ($r=0.155, p=0.016$) but not fruit consumption. This study demonstrated a high prevalence of inadequate consumption of fruit

and vegetable among preschoolers and different factors exhibited different associations on fruit and vegetable consumption separately. Hence, conducting a need assessment before implementation of intervention by health professionals is important in order to evaluate the consumption of fruit and vegetable of the children and thus tailor specific strategies responding to their condition.

B04 Development of a food diary mobile application and its acceptability among young adults

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Mobile smartphone applications (apps) exhibit great potential in assessing dietary intakes due to its high accessibility and production of informative data. However there is a dearth of dietary assessment tools in the form of mobile apps in Malaysia. This two-phase study was conducted to develop and evaluate the acceptability of a food diary mobile app among young adults. Phase I was the development and bench-testing of the food diary. Phase II examined the acceptability of the food diary based on Technology Acceptance Model (TAM) questionnaire and focus group interviews following seven days of food recording. A total of 28 subjects aged 18-24 years participated in this study. Each subject was required to participate in one of the five focus group interviews. An Android-based food diary mobile app was developed based on recommendations from the literature and research team discussions. Its main features include food photos capturing, meal reviewing and text entry for food description. Based on results of the TAM questionnaire, the percentages of subjects who had a high level of agreement (agree and strongly agree) in each criterion were: 69.3% for perceived usefulness, 77.1% for perceived ease of use, 73.6% for attitude, 38.1% for intention to use, 40.2% for system quality, 33.4% for social factor, 62.6% for perceived playfulness and 91.1% for smartphone experience. Five themes were identified through the focus group interviews: (i) perception towards features of the food diary; (ii) operation flow and aesthetics of the diary; (iii) issues encountered throughout the recording period; (iv) perception towards future potential of the diary; and (v) recommendations for improvement. In conclusion, this food diary mobile app received moderate to high acceptability among young adults. However, further improvements and validation are needed before this tool can be applied in large-scale studies.

B05 Consumption of canteen foods and beverages and the relationship with nutritional status among secondary school students

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This study uses both descriptive and analytical methods to explore the nutritional value of foods and beverages sold at school canteens that may be associated with nutritional status of secondary school students. The selected nutrient examined were energy density, energy, and macronutrients such as protein, carbohydrate, fat and fiber. Cross-sectional data on 294 secondary school students aged 13 and 14 years old were used. With regards

to types of food sold, local snacks and buns such as curry puff and doughnut were found have the highest energy density and energy which were 4.99kcal/g and 296.1kcal/100g respectively. Nevertheless, this food group was observed to have high carbohydrate content (40.2g/100g) and moderately high in fat (11.3g/100g). The percentage of energy obtained from canteen food in relation to RNI was higher in females (40.7%) than male (33.0%) respondents. The prevalence of overweight and obesity were higher in males (35.2%) than females (21.2%). The mean waist circumference of male respondents (70.62±11.24cm) was higher than the females (68.35±7.99cm). Of the socio-demographic characteristics examined, none was significantly associated with BMI and waist circumference, except for ethnicity which was significantly associated with waist circumference ($p<0.05$). This study found no significant correlation between nutrient intake indicator and nutritional status among secondary school students except for fat intake which was found to have moderate positive relationship with BMI ($r=0.356$, $p<0.001$) in male respondents. In conclusion, this study suggests that types of food sold at school canteen such as local snack and bun as well as fried foods and fast foods which are energy-dense should be replaced by healthier foods choices.

B06 Determinants of fruit and vegetable consumption according to Theory of Planned Behavior among adults in Klang, Selangor

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According to World Health Organization (WHO), fruit and vegetable provide crucial nutrients for human body. The high consumption of fruit and vegetable can reduce the risk of many chronic diseases. A cross-sectional study was carried out to determine the factors associated with fruit and vegetable consumption according to Theory of Planned Behavior among adults in Klang, Selangor. A total of 104 respondents aged 19 to 59 years old were selected. The information on socio demographic characteristics, the Theory of Planned Behavior constructs which include attitude, subjective norms and perceived behavioral control, and the FFQ consisting of 30 items of fruit and vegetable were collected using interview administered questionnaire. The findings indicated that 63.5% of the respondents involved in this study were Malays. The mean age of respondents was 34.24 ± 8.72 years and the mean household income was $RM3756.0 \pm 1616.8$. In general, the consumption of fruit and vegetable among adults in Klang was low with the mean intake of fruit and vegetable was 263.14 ± 79.74 kg/day. Only 2.9% of the respondents achieved the recommended intake of at least five servings of fruit and vegetable a day. The mean of fruit and vegetable consumption were significantly higher among female ($p<0.05$), Chinese ($p<0.05$), high education level ($p<0.01$) and high household income ($p<0.01$). There was significant association between attitude ($r=0.311$, $p<0.01$) and perceived behavioral control ($r=0.221$, $p<0.05$) towards fruit and vegetable consumption. In conclusion, In conclusion, socio demographic characteristics (gender, ethnicity, education level and household income) and internal factors (attitude and perceived behavioral control) are the determinants of fruit and vegetable consumption among adults in Klang, Selangor. Therefore, interventions program with effective strategies to increase consumption of fruit and vegetable are needed.

B07 Association between added sugar intake with weight status among Malay primary schoolchildren in Kuala Lumpur

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Food and beverages intake pattern may play a major role in the current obesity epidemic. This study was carried out to determine the association between added sugar intake with weight status among Malay primary schoolchildren in Kuala Lumpur. Anthropometric measurements including height, weight and waist circumference measurements were obtained. Socio-demographic information and beverages intake habit were determined using a questionnaire. Two days 24-hour diet recall (1 weekday and 1 weekend) by interview was used to determine the food and beverages intakes of subjects. 91 boys and 89 girls aged 9 to 11 years old from 4 primary schools in Kuala Lumpur participated in this study. Overall, prevalence of overweight and obesity were 14.4% and 30.0% respectively. There were 33.3% children (32.3% boys and 34.5% girls) who were centrally obese. The favourite beverages of children were malted milk (33.3%), fruit juices (17.8%) and flavoured drinks (16.1%). The commonly consumed beverages were plain water (65.6%), milk and soy-based beverages (8.9%) and flavoured drinks (7.2%). 52.2% children consumed 6-10 glasses of plain water daily. The mean intakes of energy (1955 ± 329 kcal/day, $p < 0.01$), carbohydrate (226.8 ± 47.4 g/day, $p < 0.01$), protein (88.0 ± 22.8 g/day, $p < 0.01$), fats (77.7 ± 18.5 g/day, $p < 0.01$) and added sugar (36.2 ± 22.6 g/day, $p < 0.05$) intakes among overweight and obese children were significantly higher than normal children. There were no significant differences between added sugar intake of children on weekday (28.3 ± 22.3 g/day) and weekend (28.2 ± 22.5 g/day). Obese (34.7 ± 21.8 g/day, $p < 0.05$) and centrally obese (42.7 ± 19.6 g/day, $p < 0.05$) boys consumed significantly higher mean added sugar intake than normal boys, but not girls. Pearson correlation showed moderately strong positive relationships between added sugar intake with body weight ($r = 0.400$, $p < 0.01$), waist circumference ($r = 0.395$, $p < 0.01$) and body mass index ($r = 0.421$, $p < 0.01$). In conclusion, this study showed that there is a moderate association between added sugar intake with weight status in children.

B08 Perception and knowledge on the use of Chinese herbs among the Chinese population in Kota Bharu, Kelantan

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The use of herbal medicine is affected by several factors such as gender, age, ethnicity and income although it could be questionable whether the herbs are properly used and consumed. The objective of this study is to determine the perception and knowledge on the use of Chinese herbs for medical and health maintenance purposes among Chinese population in Kota Bharu, Kelantan. 378 respondents participated in this study by completing self-administered bi-language questionnaire which were distributed through primary and secondary schools. The study findings show that there is a significant association between education level and the use of Chinese herbs for medical ($p = 0.011$) and health maintenance purposes ($p = 0.031$). There is also a significant association between income and the use of herbs for medical purpose ($p = 0.011$). However, there are no significant association between

age and the use of herbs for medical ($p=0.66$) and health maintenance purposes ($p=0.67$) and between income and the use of herbs for health maintenance purpose ($p=0.386$). The results also show that there are significant associations between knowledge and perception and the use of herbs for health maintenance purpose ($p=0.001$; $p<0.001$). However, there are no significant association between knowledge and perception and the use of herbs for medical purpose ($p=0.052$; $p=0.285$). It could be suggested that assessments of attitude towards traditional medicine should be incorporated in future studies in order to gain a clearer understanding on the level of utilization of Chinese herbs in Kelantan. It is hoped that the findings from this study could assist health authorities in the promotion of safe and effective use of herbal and traditional medicine in Malaysia.

B09 Knowledge, attitude and practice towards traditional health belief and practices relating to food habits among indians in kelantan: a cross sectional study

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The aim of this study is to determine the knowledge, attitude and practice towards traditional health belief and food habits among Indian community in Kelantan. Assessment was conducted through food habits that been practiced by the community in their daily life, knowledge level and changes in food habits, effect of socio-demographic factors on knowledge level and practices about traditional health belief. Respondents were selected from Indian ethnicity aged 18 years and above from Kota Bharu, Tanah Merah, and Kuala Krai. 336 respondents participated in the study. The study findings indicate that 81% male and 85% female used ingredients related to Ayurveda and Siddha medicinal system in their daily life for health purposes while 19% male and 14.3% female used it for flavour enhancing. It was found that 98.2% of Indians inherited the information regarding the usage of herbs and spices from generation to generation followed by internet (1.2%) and newspapers (0.6%). Chi square was used to test the association among categorical data. There are significant relationship ($p<0.05$) between gender, geographical area and household income with knowledge level among Indians in Kelantan. However, there are no significant association ($p>0.05$) between gender and knowledge level with practice on traditional health belief and food habits. Frequency of practice related to traditional health belief and food habits showed 41.4% practice it only several times in a year and 17.9% practice it on daily basis. The study concluded that Indians in Kelantan are still practising and following their traditional health belief and food habits despite current changes in food culture, practices and habits in this era of globalization and modernization.

B10 Body weight status of university students and its relationship with energy density and nutrient adequacy of food consumed from canteens in the campus

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The prevalence of overweight and obesity have been growing at an alarming rate for decades in both children and adults as the opportunities to eat energy-dense foods are omnipresent. The aim of the study is to assess the relationship between body weight status with the foods

consumed in eateries in terms of frequency, energy density and nutrient adequacy. A total of 316 students from a private university in Kuala Lumpur participated in this study. Respondents completed a set of questionnaire and weight, height, body fat percentage as well as waist circumference were measured. About 35% females and 18% males were underweight while 8% females and 16% males were overweight. Energy and nutrient intake were described in relation to the Recommended Nutrient Intake (RNI) for Malaysians. The mean energy intake consumed from lunch by males were higher than females (525kcal; 498kcal). Energy of foods sold ranged from 164kcal/100g to 291kcal/100g. Canteen foods provided about 22% of energy of RNI. About 61% of energy was obtained from carbohydrate, 44% from protein, and 6% from fats. Micronutrient content per 100g in the foods were also low. There was a significant difference in body mass index among ethnic group but in females only ($X^2=11.81$; p -value=0.011). Body fat percentage was also found to be significantly different among ethnicity in males ($X^2=7.396$; p -value=0.028). There was no relationship between energy density, energy and nutrient intake with body weight status. In conclusion, most of the students in this study had healthy body weight status but food consumed for lunch at campus canteen were high in energy density, low in micronutrients content and fibre. University canteen operators should be educated with nutritional knowledge to provide healthier foods for students.

B11 Influences of socio-demographic characteristics on fruits and vegetables intake of Malaysian primary school children

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Little is known about the influence of socio-demographic background on consumption of fruits and vegetables in Malaysian school children. This study aimed to determine the association of socio-demographic characteristics with fruits and vegetables intakes of Malaysian primary school children using data from SEANUTS Malaysia. This survey is part of a larger multi-centric study carried out among 16,744 children aged 0.5 to 12 years in four countries in South East Asia. Data from a total of 1,780 children aged 7 to 12 years, from six regions of Malaysia was included in this analysis. Dietary intake was assessed by self-reported food frequency questionnaire. Socio-demographic characteristics were obtained by self-reported questionnaire. Mean fruits and vegetables intakes were 1.32 ± 0.04 servings/day and 1.15 ± 0.05 servings/day, respectively. It was found that 20.4% and 9.5% of children met the fruits (≥ 2 serving per day) and vegetables (≥ 3 serving per day), recommendations respectively based on the Malaysian Dietary Guidelines for Children and Adolescents. General linear models showed that age was positively associated with fruits ($\beta=0.07$, $p<0.01$) and vegetables ($\beta=0.13$, $p<0.001$) intakes of children. Boys consumed 0.15 daily servings of fruits less than girls ($p<0.05$). Malay children consumed 0.69, 0.46 and 0.36 daily servings of vegetables less than Chinese, Indian and children of other ethnic groups, respectively. Children whose mother had tertiary education were found to have significantly higher vegetables intake ($\beta=0.64$, $p<0.01$) as compared to those with mothers who did not attend school. Area of residence, paternal education, number of children and household income did not influence fruits and vegetables intake of children. In conclusion, socio-demographic characteristics including age, sex, ethnicity and maternal education were associated with fruits and vegetables intake of Malaysian primary school children. Further studies of social influence, including social support and social interaction, on children's fruits and vegetables intakes are needed.

B12 Comparison of parental influences and dietary practices between normal weight and overweight or obese primary school children in Hulu Langat district, Selangor

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Parents are influential in developing positive health behaviour in children to prevent childhood obesity. However, there is a need to determine either father or mother or both of them influence the body weight status of children. This study compares the parental influences and dietary practices between normal weight (NW) and overweight or obese (OW/OB) primary school children. There were 419 children aged 10 to 11 years old from four randomly selected national primary schools, and they were screened for their BMI categories according to WHO Growth Reference 2007. Next, 105 OW/OB children were matched for sex, age and ethnicity with 105 NW children, and both of their father and mother were recruited as study subjects. The children completed modified Children's Eating Behaviour Questionnaire (CEBQ) and two-day 24-hour dietary recall. Their fathers and mothers self-reported their body weight and height, completed Caregiver's Feeding Styles Questionnaire (CFSQ) and Child Feeding Questionnaire (CFQ). In this study, about 3 out of 10 children (34.9%) were overweight and obese. Overweight or obese father ($\chi^2=6.885, p<0.05$) with indulgent or uninvolved parenting style ($\chi^2=9.609, p<0.05$) were more likely to have OW/OB children instead of NW children. Both fathers and mothers of OW/OB children perceived the body weight status of their children correctly (Father: $t=-5.571, p<0.05$; Mother: $t=-5.593, p<0.05$) and applied less pressure on their children to eat (Father: $t=4.770, p<0.05$; Mother: $t=5.019, p<0.05$) whereas fathers of OW/OB children perceived less feeding responsibility ($t=2.024, p<0.05$) and monitored less on the food their children ate ($t=2.090, p<0.05$). Weaker response to satiety ($t=2.795, p<0.05$) and more picky in food selection ($t=-2.056, p<0.05$) were found among OW/OB children instead of NW children. To conclude, both father and mother play an important role in preventing childhood obesity. In order to have an effective intervention program to prevent childhood obesity, health care professionals should involve not only mother, but father as well.

B13 Factors associated with nutritional supplement use among exercisers in a selected gym in Penang Island

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Nutritional supplement use is known to be popular among physically active individuals, including exercisers at gyms. However, there is little information about nutritional supplement consumption among gym users in Malaysia. The aim of this cross-sectional study was to investigate the prevalence and factors associated with nutritional supplement use amongst exercisers at a selected gym in Penang Island, Malaysia. A total of 82 gym users (87.8% male and 12.2% female), with a mean age of 29.62 ± 8.05 years participated in this study. Nutritional supplement beliefs were assessed using 22 beliefs statements; physical activity level was evaluated using the International Physical Activity Questionnaire; nutritional supplement use was determined using a questionnaire adopted from a previous study. Nutritional supplement use was reported among 51.2% of the participants, with protein being the most popular choice among the participants who used such supplement (76.2%). The most common reason for using nutritional supplement was muscle building (47.6%), followed by both recovery (45.2%) and energy supply (45.2%). Friends (73.2%) and

the Internet (54.9%) were the main source of information, while only a few individuals sought information from health professionals (14.6%). Nutritional supplement use increased with increasing age ($r= 0.263$; $p= 0.02$). Underweight or normal weight individuals ($\chi^2= 5.567$; $p= 0.03$) and non-smokers ($\chi^2= 6.981$; $p= 0.01$) reported significant higher consumption of nutritional supplement. In addition, the more physically active the exercisers were, the more likely they were to report the use of nutritional supplements ($r= 0.255$; $p= 0.02$). A high prevalence of nutritional supplement use was observed. Further investigation and the dissemination of scientifically based information are crucial to prevent inappropriate use and the occurrence of possible harmful effects.

B14 Eating habits among on and off campus students in Universiti Kebangsaan Malaysia (UKM)

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Eating habits of students is an important issue as it influences the quality and productivity of students in the contacts of practicing healthy lifestyle. This study was conducted to assess eating habits among Universiti Kebangsaan Malaysia (UKM) students based on different residential area either they were on campus or off campus. This study subjects comprised 200 undergraduate and postgraduate students in UKM (male and female) that were randomly chosen from different faculties. The study was conducted on and off UKM Bangi campus. Data collection was conducted through a questionnaire comprised of information on socio-demographic, eating habits and eating out habits. The results showed there were no significant differences ($p>0.05$) for the frequency of food intakes and food expenses estimation between subjects on and off campus. The usual dining locations visited and the option places for dining showed significant differences ($p<0.05$) between the subjects on and off campus. The frequency for supper also showed significant differences ($p<0.05$) between the two groups. However, there was no significant differences ($p>0.05$) for skipping all three main dishes between the two groups. There was significant differences ($p<0.05$) in the frequency of eating own cooked dishes between subjects on and off campus. For the eating out habits, the frequency and expenses estimation for eating out showed significant differences between the two groups ($p<0.05$). It is hoped that this study would open the eyes of the private health organizations and the government to promote activities and programs related to healthy eating among university students.

B15 Walking activity and food intake among female students in Universiti Kebangsaan Malaysia (UKM)

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Walking is a physical activity in sedentary category that is often practiced by students as an ideal form of exercise. Physical activity and food intake are interrelated. Thus, this study was performed to determine the correlation between the number of steps taken and food intake among female students in UKM. A total of 100 female students between 19–29 years old were recruited. Subjects were required to wear pedometer for 3 days to measure the number of steps taken every day. Anthropometric measurements including height and weight measurements were recorded. Subjects were also given a set of forms including a

form to record the number of steps and a 24 hour dietary recall form to record their food intake for 3 days. The data obtained were analyzed using Nutripro software and SPSS version 22.0. It was found that the average overall steps taken is 5508.1 ± 2502.7 steps, while the average food intake is 1677 ± 473 kcal for energy, 20.3 ± 60.9 g for protein, 215.8 ± 57.8 g for carbohydrate and 54.3 ± 19.6 g for fat. There was no significant correlation ($p = 0.426$) between average steps and food intake among subjects. Most of the subjects (49%) were categorized as less active while the rest were moderately active (45%) and active (6%).

B16 Intakes of dietary energy density among obese and non-obese adolescents in Kamunting and Taiping, Perak

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While recent reports indicate that dietary energy density (DED) may play a role on greater adiposity, little is known about the consumption of foods high in energy density among adolescents in Malaysia. This study aimed to examine DED consumed by obese and non-obese adolescents in Kamunting and Taiping, Perak. This cross-sectional study included 294 adolescents aged 13-14 years old which comprises 166(56.5%) male and 128(43.5%) female. Participants reported their dietary intake and physical activity using a self-administered questionnaire. DED was calculated by dividing total food energy(kcal) by total food weight in gram(g), excluding beverages. Weight, height and waist circumference(WC) was measured using calibrated scales with BMI was then calculated. Obese (including overweight) and normal weight adolescents were defined according to the International Obesity Task Force age and sex-specific BMI cut-offs. Misreporting of energy intake was calculated using a standard equation. No significant difference was observed in intakes of food high in energy density among obese (1.8 ± 0.3 kcal/g) and non-obese respondents (1.8 ± 0.4 kcal/g) ($p=0.315$) but was significantly higher in males compared to females in obese ($P=0.027$) and non-obese ($p=0.024$) groups. Greater percentage of obese respondents under reported their energy intake compared to non-obese respondents (93.2% vs 56.5%). After adjusting for dietary misreporting, energy intake and physical activity, no significant correlations were observed in intakes of DED and BMI in obese ($r=0.087, p=0.299$) and non-obese ($r=-0.028, p=0.735$) groups. Similarly, no significant correlations were observed between DED and WC among obese ($r=0.016, p=0.846$) and non-obese ($r=0.013, p=0.875$) respondents. There was a significant difference in physical activity level among obese and non-obese group ($\chi^2=14.622, p=0.001$). Energy ($t=-16.599, p<0.001$), carbohydrate ($t=-9.278, p<0.001$), protein ($t=-15.704, p<0.001$) and fat ($t=-15.980, p<0.001$) intakes showed significant differences among obese and non-obese respondents. Hence, there was no significant association between DED and adiposity. This might due to other uncounted factor that was not included in this study.

B17 Pubertal development and disordered eating behaviors among Malaysian adolescents aged 12-19 years old

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Puberty is a critical period whereby symptoms of disordered eating start to develop during adolescence. This cross-sectional study was conducted to determine the association between perceived pubertal timing, pubertal status and disordered eating behaviors among Malaysian adolescents aged 12-19 years old. Stratified multi-stage sampling was applied in the study sample. A total of 9286 adolescents were recruited from 67 schools in all states of Malaysia. Pubertal status was assessed using the Pubertal Developmental Scale (PDS), while perceived pubertal timing was assessed by asking respondents to rate their own development in comparison with their peers. Disordered eating behaviors were assessed by using the Eating Attitude Test-26 (EAT-26). The prevalence of disordered eating behaviors was 31.7%, (95%CI: 30.6, 32.8) with a mean score 15.65 (95% CI: 15.34, 15.97). The prevalence of disordered eating was higher in male respondents (34.9%, 95%CI: 33.2, 36.6) than female (29.2%, 95%CI: 27.8, 30.7). Most of the female respondents (83.6%, 95%CI: 82.4, 84.8) were in advanced pubertal stage (Stage 4) as compared to male respondents (45.1%, 95%CI: 43.3, 46.9). This indicates that female adolescents were more matured as compared to male adolescents. 45.0% (95%CI: 40.0, 50.1) of the respondents in the beginning pubertal (Stage 2) had disordered eating behaviors. In term of perceived pubertal timing, majority of the respondents (female: 61.1%, 95%CI: 59.5, 62.6; male: 57.6%, 95%CI: 55.8, 59.4) perceived that their pubertal timing were about the same times as their peers. However, about half of the respondents (50.6%, 95%CI: 46.0, 55.2) who perceived their pubertal timing as much earlier than their peers had disordered eating behaviors as compared to their counterparts (49.4%, 95%CI:44.8,54.0). Findings from this study recommend that the pubertal status and perceived pubertal timing should be considered in prevention of disordered eating behaviors in Malaysian adolescents.

B18 Vitamin D insufficiency status, its risk factors and relationship with gestational diabetes mellitus among Malaysian pregnant women in an urban district

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The aim of this study was to determine the prevalence of vitamin D insufficiency (serum 25(OH)D < 50 nmol/l), its risk factors and relationship with gestational diabetes mellitus (GDM) among pregnant women. A prospective cohort study involving 396 first trimester pregnant women aged 18-40 years was conducted in Petaling District. The subjects completed the questionnaire on socio-economic characteristics, risk factors and food frequency questionnaire (FFQ) for vitamin D, anthropometric measures (weight and height), skin colour measurements and serum 25(OH)D determination. At 24-28 weeks of pregnancy, diabetes screening was performed and the vitamin D FFQ was repeated. Prevalence of vitamin D insufficiency (serum 25(OH)D < 50 nmol/l) was 90.4%, and the independent predictors of serum 25(OH)D < 50 nmol/l were Malay ethnicity (OR 33.681; 95%CI: 12.810,88.556), Indian ethnicity (OR 16.863; 95%CI: 3.781,75.204), secondary education (OR 12.120; 95%CI: 2.712, 54.158), tertiary education (OR 14.379; 95%CI: 3.311,62.451) and low dietary intake of vitamin D (OR 0.997; 95%CI: 0.995,0.999). Meanwhile, the prevalence of GDM was 24.2% and its predictors were age ≥ 35 years (OR

3.003; 95% CI: 1.192, 7.570), total amounts of vitamin D intake from food and supplements < 600 IU/day (OR 1.934; 95% CI: 1.136, 3.292), family history of diabetes (OR 2.430; 95% CI 1.436, 4.113), and history of previous GDM (OR 8.116; 95% CI 3.288, 20.033). Educational activity for the prevention of vitamin D insufficiency should be given to pregnant women, especially of Malay and Indian ethnicity, and those with low dietary vitamin D intake. Although no significant association was found between vitamin D insufficiency at first trimester with GDM, but this prospective study showed that increasing vitamin D intake is important for reducing the risk of GDM

B19 Food album aid development and validation for estimating portion sizes of common Malaysian foods and dishes for adult

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False measurement of the portion sizes of foods usually occurs during the dietary intake assessment. Research showed that the food photographs can aid in the estimation of amount of foods consumed more accurately. Therefore, this study aimed to develop and validate a food album of common Malaysian foods and dishes for aiding in the estimation of portion sizes among adult subjects. The total food items in the food album are eighty. Food album development involved four phases which are the determination of common Malaysian foods through discussion with expert panel, selection of the common and most popular foods and dishes consumed by Malaysian adults, the preparation and development of the food album including the photograph session, and the last phase was a validation study. The validation study involved eighty subjects (mean age, 21.54±4.27 with 31.3% of male and 68.8% of female) that were selected through convenience sampling method. The subjects need to choose the portion sizes of foods presented that were similar with the portion sizes of foods depicted in the food photograph. There are eleven food items that were selected for the validation study which are white rice with curry gravy, spaghetti, glutinous rice, fried mackerel, chicken rice, grated coconut, raisins, fried anchovy, *Maruku*, stir-fried water spinach and mayonnaise. The results from the validation study showed that there was a significance difference in the estimated and actual portion sizes of glutinous rice ($p=0.023$), fried mackerel ($p=0.000$), grated coconut ($p=0.000$), raisins ($p=0.000$), fried anchovy ($p=0.000$), *Maruku* ($p=0.000$) and stir-fried water spinach ($p=0.000$). There was non-significant difference in white rice with curry gravy ($p=0.063$), spaghetti ($p=0.082$), chicken rice ($p=0.107$) and mayonnaise ($p=0.665$). Four from eleven food items tested have been validated. Spaghetti (65%) was the highly correct estimated food portion size and followed by mayonnaise (61.3%) and white rice with curry gravy (58.8%). Therefore, food album can be used for the validated food items.

B20 Patients' satisfaction with hospital food provision at government hospitals in Malacca.

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Patients' hospital food consumption is often compromised, mainly because it is not reflective of their preferences and eating habits. This cross-sectional study was conducted to understand patients' satisfaction with various aspects of food provision in Malacca

General, Jasin and Alor Gajah Hospitals. The Wesley Hospital Foodservice Patient Satisfaction Questionnaire (WHFPSQ) was adapted and used to collect the data throughout January and February 2015. Simple random sampling method was used to recruit 111 patients, aged 11-72 years, who received normal diet and had been admitted for ≥ 1 day. Most of the patients were aged 30-39 years old ($n=28$, 25%), were male patients ($n=69$, 62%) and were hospitalised for 2-7 days ($n=80$, 72%). Majority were satisfied with hospital food ($n=78$ 70.3%). In general, patients felt that not enough food choices were available and they were not able to choose healthy meals. Nevertheless, they felt staff who delivered their food were friendly, helpful and looked presentable. Food quality aspects (taste, flavour, method of vegetable cooked and expectation of quality of food), staff/service factors (staff behaviour, appearance and helpfulness) and portion size were significantly associated with overall satisfaction with hospital food ($p<0.01$). Physical environment, including odour ($r=0.239$) and noises ($r=0.230$) were also significantly associated with overall satisfaction with hospital food ($p<0.05$). Length of stay showed negative association ($r=-0.338$, $p<0.01$) with overall satisfaction, indicating that the longer they stay, the less satisfied they were with hospital food. However, no association was found between food choices, healthy meals, food texture and temperature with overall satisfaction. This study revealed that although overall satisfaction with hospital food was satisfactory, various factors including food and service elements affected patients' satisfaction. Satisfaction often reflects patients' actual food consumption. Therefore, findings of this study are useful in improvising provision of food, by taking into account the aspects that affected their satisfaction.

B21 Factors associated with disordered eating among female adolescents in Sepang, Selangor

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This cross-sectional study determined the predictors of disordered eating among 232 female adolescents in Sepang, Selangor. Body weight status, body image, psychological factors, sociocultural influences, eating patterns and disordered eating were assessed using Anthroplus, Contour Drawing Rating Scale, Depression, Anxiety and Stress Scale, Sociocultural Influences on Body Image and Body Change Questionnaire, Youth Risk Behavior Surveillance Questionnaire and Eating Attitude Test respectively. Around 55.6% of the adolescents were Malay, 26.7% Indian, 14.2% Chinese and 3.4% Others. The prevalence of overweight and obesity, thinness, and severe thinness, abdominal obesity and disordered eating were 25.4%, 4.3%, 20.3% and 36.2% respectively. Around 40.5% were incorrect estimators of body weight whereas 79.7% were dissatisfied with body size. Around 47.4%, 32.4% and 8.7% of the respondents were severely depressed, severely anxious and severely stressed respectively. The media had the highest mean scores for perceived pressure to lose weight and to gain muscles compared to fathers, mothers, and peers. The highest mean number of days/week for consumption of vegetables, fruits, carbonated drinks, milk and breakfast was for vegetables (4.60 ± 2.31 days). Race ($\chi^2=9.758$, $p<0.05$), waist circumference ($r=0.149$, $p<0.05$), perception of body weight ($\chi^2=2.367$, $p<0.05$), perceptions of body size ($r=0.131$, $p<0.05$), stress ($r=0.400$, $p<0.01$), anxiety ($r=0.342$, $p<0.01$), depression ($r=0.303$, $p<0.01$), perceived pressure to lose weight from father ($r=0.416$, $p<0.01$), mother ($r=0.351$, $p<0.01$), peers ($r=0.375$, $p<0.01$), media ($r=0.336$, $p<0.01$) and perceived pressure to gain muscle from father ($r=0.351$, $p<0.01$), mother ($r=0.353$, $p<0.01$), peers ($r=0.358$, $p<0.01$), media ($r=0.391$, $p<0.01$) and consumption of carbonated drinks ($r=0.207$, $p<0.01$) were significantly associated with disordered eating. Multiple linear regression analysis showed six factors, namely stress, perceived pressure to

lose weight from father, perceived pressure to gain muscle from media, being Malay, body weight under-estimator, and perceived pressure to lose weight from media were predictors for disordered eating, explaining 35.2% of the variance. Planning for intervention programs targeting disordered eating among adolescents should take these factors into consideration.

B22 Assessment of dietary and lifestyle practices among Malay survivors of breast cancer in Kelantan

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Understanding the dietary and lifestyle practices among survivors of breast cancer are important in order to improve the general health and wellbeing, and quality of life. However, little is known about the effects of diet and lifestyle practices after diagnosis on breast cancer survival. Hence, the main objective of the present study was to examine the dietary and lifestyle practices among 92 Malay survivors of breast cancer in Kelantan. Pre-piloted questionnaire was used to assess the socio-economic status, dietary and lifestyle-related behavioural practices, whereas quality of life of the participants were assessed using the European Organization for Research and Treatment of Cancer entitled “Quality of life Questionnaire version 3.0 and its breast cancer module (QoL-C30/+BR23) both validated in Malay version. The median age of the participants were 51.0 y [95% CI: 47.8-51.4] and the median age at the time of breast cancer diagnosis was 46.0 y with almost half of them (46.7%) were diagnosed at stage II. Dietary practices after diagnosis of cancer showed that majority of the participants (65.2%) were generally consumed snacks at least one per day. Majority of them were preferred to consume food in frying method (62.0%), followed by grilling (47.8%) and steaming (30.4%). In terms of nutrition labelling practice, The use of nutrition food label among these participants was low with majority of them were never or rarely read the nutrition label in the foods packaging such as sodium (72.8%), carbohydrate (65.2%), protein (62.0%), fiber (56.5%) and total fat (55.4%). Median total physical activity (PA) of the participants were 1.0 hour/day [95% CI: 1.1-1.5], with very low levels of vigorous-intensity PA (median=0.3 hour/day [95% CI: 0.3-0.6]). In conclusion, majority of these participants were preferred to consume fried foods and the levels of nutrition label use was low, despite being diagnosed with breast cancer. Low active lifestyle practices was also reported with low PA levels. Continuous efforts and strategies of healthy eating and active lifestyle practices should be promoted among survivor of cancers in order to maintain optimal health and general well-being of these populations.

B23 Correlates of dietary and lifestyle practices among university students in Kelantan

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It is generally agreed that diet and lifestyle practices in young adulthood may have long term health implications, but information of factors associated with dietary and lifestyle-related behavioral practices among young adults such as university students is still limited. Therefore, the aim of the present study was to determine dietary and lifestyle-

related behavioral practices and its association factors among university students in two universities in Kelantan. A total of 350 participants aged between 19 and 27 y, comprising 127 males and 223 females, were recruited from two public universities in Kelantan. A pre-piloted self-administered questionnaires of demographic status, dietary and lifestyle practices were assessed. The mean age of the participants were 22.5 ± 1.4 y, with majority of them were classified as normal (65.4%). Adjusted correlation analysis showed that age, gender, and ethnicity had significantly associated with habitual dietary and lifestyle practices of these participants. When these associations were further determined using multivariate analyses (ANCOVA) test after adjusting for potential confounding variables, it showed that younger participants had higher levels of daily physical activity ($p < 0.05$) than their older participants. Males had significantly higher moderate-intensity ($p < 0.01$), vigorous-intensity ($p < 0.001$) and total physical activity levels ($p < 0.001$), whereas Chinese participants had higher frequency of weekly breakfast ($p < 0.001$), lunch ($p < 0.01$) and dinner ($p < 0.001$), whereas Malay participants had significantly higher weekly consumption of snacks during morning ($p < 0.01$) and evening ($p < 0.05$) and higher duration spent in sedentary practices compared to their Chinese counterparts ($p < 0.001$). Participants with high sedentary practices had significantly higher snacking practices ($p < 0.05$) compared to those of low sedentary levels. These findings suggest that gender and race are likely to have some potential impacts on dietary and lifestyle factors among young university students. This further emphasises the importance of socio-demographic characteristics should also be taken into account when designing and implementing any health and nutrition-related promotional activities among university students.

B24 Comparison of patients' satisfaction between 'bulk trolley' and 'centralised plating' food service systems in two government hospitals in Selangor

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Foodservice is regarded as one of the most important services of hospital services, as food plays a vital role in aiding patients' recovery and wellbeing. This study aims to compare patients' satisfaction between the 'bulk trolley' and 'centralised plating' foodservice systems in two government hospitals in Selangor (Ampang and Kajang hospitals). A cross-sectional study was conducted, whereby 'The Acute Care Hospital Food Service Patient Satisfaction Questionnaire' (ACHFSPSQ) comprising food quality, food provision, menu selection, meal serving time, staff attitude and environment was distributed to patients who were on normal diet. Likert scale was used to analyse the answers, where a mean score ≥ 3 indicated that patients were satisfied. Simple random sampling was used to recruit 230 patients (43.5% from bulk trolley and 56.5% from centralised). There were more female ($n=124$, 54%) than male ($n=106$, 46%) patients and majority were Malays ($n=95$, 41.3%). Regardless of the type of foodservice system, most of them indicated that hospital food was 'good' (53% in bulk-trolley and 57% in centralised). However, in both systems, patients were dissatisfied with the taste (mean=2.45 in bulk-trolley and 2.66 in centralised), empathy shown by staff (mean=2.37 in bulk-trolley and 2.11 in centralised), noise (mean=1.74 in bulk-trolley and 1.39 in centralised), smell (mean=1.30 in bulk-trolley and 1.24 in centralised) and conditions of the cutlery (mean=1.03 in bulk-trolley and 1.00 in centralised). Significant differences ($p < 0.05$) in satisfaction between the two foodservice systems on food (presentation, temperature, portion size, serving time, food variety and menu selection) was reported. Additionally, satisfaction with staff appearance, empathy and noises showed significant difference between bulk trolley and centralised plating system ($p < 0.05$). Findings indicated that patients' satisfaction certainly differed according to the foodservice system used, which may affect their food consumption subsequently. Therefore, the foodservice system that optimizes patients' food consumption should be implemented.

B25 Sweet Taste Preferences and Body Mass Index (BMI) Among Aboriginal Children and Urban Children in Selangor, Malaysia

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A cross-sectional study was carried out on 102 primary school children in Selangor, Malaysia to investigate the association of sweet taste preferences and body mass index (BMI) among aboriginal children at SK Sg Judah Pulau Carey and urban children at SK Taman Tun Dr. Ismail Jaya in Selangor. Socio-demographic data were collected by using questionnaire. Anthropometric measurements were conducted to obtain the data of BMI. Children were given two samples of apple juice; one without granulated white sugar and another one with granulated white sugar. They rinsed their mouth with plain water after tasting the first sample before proceeding to taste the second sample. They were required to choose one of the samples that they preferred more. A total of 27.6% aboriginal children and 31.3% urban children were with overweight and obesity. No significant difference in BMI was found between the two groups. The percentage of choosing natural apple juice with the addition of granulated sugar was 17.0% higher among the aboriginal children. A significant difference of taste preferences and place of living ($p=0.028$) was found. BMI was not significantly associated with taste preferences. In conclusion, aboriginal children had higher percentage in choosing apple juice that contained additional granulated white sugar compared to the urban children. However, the sweet taste preference did not associate with the BMI of the children.

B26 Correlation between dietary intake with anthropometric status, blood pressure and lipid profile among Malay adolescents in Kuala Lumpur

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Studies have shown that dietary intake is positively correlated with anthropometric status, blood pressure and lipid profile in adults; however, little is known if the same is true among adolescents. A cross-sectional study involving 143 Malay adolescents (50 boys, 93 girls) aged 10-14 years old was carried out in primary and secondary schools in Kuala Lumpur. Body weight, height, waist circumference (WC), body fat percentage (%BF), blood pressure and lipid profile were measured. Food intake was assessed using 3-day dietary records. Subjects were categorised based on WHO 2007 BMI-for-age growth reference, as well as WC $\geq 90^{\text{th}}$ percentile according to Poh et al. 2011. Mean BMI and WC were 19.5 ± 4.9 and $63.8 \pm 11.9\text{cm}$, respectively; with 25.2% overweight/obese and 25.9% had WC $\geq 90^{\text{th}}$ percentile. Mean systolic (SBP) and diastolic blood pressure (DBP) were $100.8 \pm 11.9\text{mmHg}$ and $61.8 \pm 8.5\text{mmHg}$, respectively. There were significant differences in SBP, DBP, triglyceride (TG), high-density lipoprotein cholesterol (HDL-C) and low-density lipoprotein cholesterol (LDL-C) between BMI categories ($p < 0.01$) and WC categories ($p < 0.05$). Mean energy, carbohydrate, protein and fat intakes were $1635 \pm 226\text{kcal}$, $215.1 \pm 37.6\text{g}$, $61.7 \pm 30.2\text{g}$ and $61.5 \pm 12.8\text{g}$, respectively; while sodium and potassium intakes were $1898.8 \pm 532.6\text{mg}$ and $797.1 \pm 246.5\text{mg}$, respectively. BMI was significantly correlated with energy ($r=0.440$,

$p < 0.01$), carbohydrate ($r = 0.315$, $p < 0.05$) and protein ($r = 0.299$, $p < 0.05$) intakes. Positive correlation was also found between WC with energy ($r = 0.480$, $p < 0.01$), carbohydrate ($r = 0.303$, $p < 0.05$) and protein ($r = 0.299$, $p < 0.05$) intakes. Potassium intake was positively correlated with TG ($r = 0.286$, $p < 0.05$). There were significant negative correlations between LDL-C with protein ($r = -0.334$, $p < 0.05$) and calcium ($r = -0.322$, $p < 0.05$) intakes. Total cholesterol was negatively correlated with protein ($r = -0.308$, $p < 0.05$), calcium ($r = -0.304$, $p < 0.05$), niacin ($r = -0.298$, $p < 0.05$) and thiamin ($r = -0.293$, $p < 0.05$) intakes. In conclusion, energy and nutrient intakes were correlated with anthropometric status and lipid profile, but not blood pressure. Promoting healthy eating in adolescents is therefore important to ensure their current and future well-being.

B27 Effectiveness of multiple exposure on acceptance of a test vegetable among children aged 6 year at Kuala Lumpur

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Consumption of vegetables among Malaysian children was reported to be low. It is about 75% of them not consuming vegetables in their daily diet. The aim of this study was to investigate the effectiveness of repeated exposures on acceptance of a test vegetable among children aged 6 years. This study was conducted in three phases. The subjects were selected among pre-schooler (30 boys, 45 girls) from 5 kindergartens in Cheras, Kuala Lumpur. First phase consist of questionnaire to determine the demographic data, usual preparation methods, frequency of vegetables served and consumed by the children at home and parent's perception towards this intervention method. This phase was aimed to determine the selection of the most vegetable as the test vegetable. In second phase, meals that consist of test a vegetable which is kaliaian stir fry were provided to the subjects during rest time at the kindergartens for 3 days. Thirty-six grams of the test vegetables was served and the leftover was weighed. The third phase was a questionnaire that consist of the record that rating the children likes towards the test vegetables. There was a significant increase in test vegetable consumption from the first day (13.6g) to the third day of exposure (13.9g), $p < 0.05$. Based on the reported from the parents, the level of liking towards the test vegetable was significantly increase from the pre-intervention to the post-intervention ($p < 0.05$). Most of the parents were agreed with this multiple exposure as an effort to increase the vegetable consumption among children. It is suggested that multiple exposure to vegetables can be an initiative by the parents or care giver to increase consumption of vegetables among pre-schooler.

B28 Sugar-sweetened beverages (SSBs) intake in obese and non-obese adolescents in Kamunting and Taiping, Perak

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Consumption of SSBs may be a key contributor to the epidemic of obesity, however there is still lack of study on the pattern of SSBs intake among Malaysian adolescents. This cross-sectional study aimed to determine and compare socio-demographic status, SSBs consumption, nutrients intake, physical activity level, BMI, and waist circumference (WC) between obese and non-obese adolescents. A total of 80 obese and 80 non-obese adolescents

aged 13 -14 years old were included in this study. The International Obesity Task Force (IOTF) BMI cut-off points for children and adolescents was used to classify respondents into obese and non-obese groups, whereas abdominal obesity was defined as WC >90th percentile. Self-administered questionnaires were used to assess socio-demographic, dietary intakes, SSBs consumption and physical activity level in these adolescents. Obese adolescents were more likely to consume higher SSBs (839.4 ± 403.3ml/day) than non-obese adolescents (505.5 ± 245.2 ml/day) (p<0.05). Obese adolescents showed significant higher BMI and WC compared to non-obese adolescents. Energy and micronutrient intake were also higher among obese adolescents compared to non-obese adolescents (p<0.05). Majority of obese (88.7%) and non-obese (66.3%) adolescents under-reported their dietary intake. Furthermore, obese adolescents were more likely to be less active compared to their non-obese counterparts (p<0.05). After adjustments for sex, energy intake, physical activity level and dietary mis-reporting, a positive correlations were found between SSBs intake and BMI (r=0.131, p=0.263), and WC (r=0.048, p=0.680) in the obese group. For non-obese group, a negative correlation between SSBs intake and BMI (r=-0.016, p=0.889), but a positive correlation between SSBs and WC (r=0.083, p=0.473) were observed. Although obese adolescents consumed higher SSBs than the non-obese counterparts, lack of associations were observed between SSBs and BMI, and WC. This could be due to other uncounted factors that may have bigger influence on adiposity.

B29 Influence of home environment and personal factors on disordered eating among early adolescents in Hulu Langat district, Selangor

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This cross-sectional study aimed to determine the association between home environment, personal factors, and disordered eating among early adolescents in Hulu Langat, Selangor. A total of 320 early adolescents (10.5±0.6 years old) from six selected primary schools in Hulu Langat and their parents participated in this study. Their perceived parenting style, disordered eating, self-esteem, depression, and body size dissatisfaction were assessed using a self-administered questionnaire. Their parents self-reported their body weight and height and answered questions regarding their weight management knowledge and the home environment; namely, food availability and accessibility, parental role modelling of healthy eating, and parental policies to support healthy eating. Multiple linear regression (MLR) was used to determine the association between home environment, personal factors, and disordered eating among early adolescents. About one in four of the early adolescents (23.8%) had disordered eating and more than half of them (50.9%) were dissatisfied with their body size. A total of 52.5% of their fathers and 45.3% of their mothers were overweight and obese. The predominant parenting style practiced by their father was authoritarian (42.5%) while 40.0% of their mothers practiced authoritative style. After controlling for socio-demographic factors (age, sex, and ethnicity), the MLR model showed that depression ($\beta=0.799$), body size dissatisfaction ($\beta=2.599$), low parental weight management knowledge ($\beta=0.659$), and high parental role modeling of healthy eating were associated with higher disordered eating behaviour among early adolescents ($F=10.151$, $R^2=0.207$ p<0.05). No associations were found between parental BMI, food availability and accessibility, parental policies to support healthy eating, perceived parenting style, self-esteem, and disordered eating among the early adolescents. These findings suggested that promotion of positive body image and positive thinking, the role of parents as a role model of healthy eating and equipped with knowledge of weight management are important to prevent disordered eating among early adolescents.

Group C: Nutrients and Other Components in Food/ Products

C01 Proximate and amino acids composition of Terengganu traditional fish-based products

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Knowledge regarding nutritional value of traditional foods is very important, but they are still limited. In Malaysia, there are many traditional foods including the famously Terengganu traditional fish-based products normally *keropok lekor rebus*, *otak-otak* and *satar*. The study determined the proximate and amino acids composition of *keropok lekor rebus*, *otak-otak* and *satar*. The methods of AOAC were used to determine the proximate while the reverse-phase HPLC system was used to determine the amino acids composition. The results showed there were significant difference ($p < 0.05$) in the proximate composition among the studied samples. *Otak-otak* showed the highest content of fat (7.99%), dietary fiber (6.31%) and energy (211.9 kcal/100g). *Satar* had the highest content of moisture (57.04%), ash (1.60%) and carbohydrates (23.12%) while *keropok lekor rebus* showed the highest content of protein (27.64%). There were also significant differences ($p < 0.05$) in the amino acids composition among samples except for alanine, arginine and tyrosine. *Keropok lekor rebus* showed the highest content of all essential and non-essential amino acids, where the great amount of amino acids were glutamate (68.59 mg/g), followed by cystine (65.91 mg/g) aspartate (45.42 mg/g), lysine (26.53 mg/g), arginine (24.54 mg/g) and threonine (20.36 mg/g). The same pattern of amino acids composition found in *otak-otak* and *satar*. The study indicates that nutritional and amino acids composition could be used for food composition database and benefits to all people towards optimum health.

C02 Determining the phosphorus to protein ratio of fast foods that commonly consumed by university students

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Phosphorus to protein ratio is newly used in the dietary management of Chronic Kidney Disease patient as well as people who need phosphorus restriction. The objective of this study was to determine the phosphorus to protein ratio of fast foods commonly consumed by university students. In order to determine the most commonly consumed fast foods, a community survey was conducted before laboratory analysis. A self-administered questionnaire was distributed to 106 university students from Faculty of Medicine and Health Sciences, Universiti Putra Malaysia by convenience sampling. The ten most commonly consumed fast foods were identified for the determination of phosphorus and protein content. The phosphorus content was analyzed using Inductively Coupled Plasma-Optical Emission Spectrometer (ICP-OES) whereas the protein content was analyzed using Kjeldtec System. The samples were bought from fast food restaurants in Serdang, Selangor. The community survey found that fast food was frequently consumed by university students with 83% of the respondents consumed fast foods at least two times per month. The laboratory analysis showed that KFC Fried Chicken, Texas Fried Chicken and Domino's Pizza Roasted Chicken Drummet contained high amount of phosphorus. The protein content of Pizza Hut

Smoked Deli Wing and Domino's Pizza Roasted Chicken Drummet are 80-90% higher than Nutrient Composition of Malaysian Food and Food Composition Guide Singapore. This was most probably due to the difference in food preparations and cooking methods. None of the fast foods exceed the recommended phosphorus to protein ratio (16mg/g); however, there was a 72% difference between the highest (9.60mg/g) and lowest ratio (4.52mg/g). As the phosphorus to protein ratio in fast foods varies widely, selection of fast foods with low ratio is deemed necessary. In conclusion, phosphorus to protein ratio of fast foods can provide beneficial information for health professionals and CKD patients. Further research is needed to cover more fast foods samples.

C03 Effect of different cooking procedures on total polyphenol content and antioxidant capacities of organic and inorganic beans

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Bean consumption is associated with lower risk of chronic diseases. Organic foods are thought to have higher contents of bioactive phytochemicals such as polyphenolic compounds. The objective of this study is to evaluate the effect of different cooking procedures (cooked without soaking and cooked after soaking) on the total polyphenol content and antioxidant capacities of organic and inorganic beans. Total polyphenol content of raw and cooked beans was analyzed by Folin-Ciocalteu reagent, whereas the antioxidant capacities were measured by FRAP assay, DPPH and ABTS radical scavenging methods. Results showed that cooked after soaking was the preparation method that caused significantly ($p < 0.05$) higher losses of total polyphenol content and antioxidant capacities than cooked without soaking. However, the losses varied according to the type of beans. Reduction of total polyphenol content and antioxidant capacities showed a conflicting result with no prevalence from either type of agriculture practices. In general, black bean, red bean, green bean, red kidney bean and soybean from both agricultural types possessed higher total polyphenol content and antioxidant capacities, whereas red dhal, yellow dhal and chickpea presented lower levels of total polyphenol as well as antioxidant capacities. Total polyphenol content showed a significant ($p < 0.001$) positive correlation with the antioxidant capacities in DPPH ($r = 0.854$), ABTS ($r = 0.867$) and FRAP ($r = 0.774$) assays. Overall, there were losses of total polyphenol content and antioxidant capacities in all samples of cooked beans as compared to their original raw beans, suggesting that actual intake of these phytochemical compounds could be overestimated when using data of raw beans. Despite the possible benefits from organic cultivation, the consumers may not be beneficially affected after the beans are cooked.

C04 Screening of aflatoxin M₁ occurrence in selected milk and dairy products in Terengganu, Malaysia

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A study was conducted to screen the occurrence of aflatoxin M₁ (AFM₁) in 53 selected milk and dairy product samples (11 liquid milk, 12 powdered milk, 8 3-in-1 beverages, 6 condensed sweetened milk, 2 evaporated milk, 7 cultured milk drink, 5 yogurt and 2 cheese samples). These samples were purchased from selected markets in Terengganu,

Malaysia in January 2014. The information gathered from a questionnaire survey on the type and brand of milk and dairy products frequently consumed among 212 subjects. Based on the responses, 53 milk and dairy products were purchased and the competitive enzyme-linked immune-absorbent assay (ELISA) method was used to determine the level of AFM₁ in the samples. Of 53 samples, 21 samples were positive with AFM₁ (39.6%) ranging from 0.9 to 119.1ng/L. In this study, the highest contamination level of AFM₁ was observed in the condensed sweetened milk sample with the level of 119.1ng/L. Although 4/53 (7.5%) of tested samples had the contamination level greater than the European Commission limit (EC) which was less than 50ng/L, the contamination levels were still below the Malaysia Food Regulation 1985 limit (less than 500ng/L). This study provided a pioneering data on the occurrence of AFM₁ in milk and dairy products in Malaysia.

C05 Comparison of total sugar content between fresh fruit juice and commercial fruit juice

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Fruit juice is often taken to substitute fruit intake in the modern diet today. In this study, fruit juice consisted of freshly extracted fruit juice and commercial fruit juice. Commercial fruit juice can be categorized into three groups: 100% fruit juice, juice drinks and fruit drinks. This study aimed to determine the estimation of total sugar content of fresh fruit juice and commercial fruit juice, and to determine whether there is any difference in sugar content between different types of fruit juices. Three methods used for sugar analysis of the fruit juice were Refractometry, Anthrone and Dubois methods. A total of 146 fruit juice sampled in the region of Klang Valley are used in this study. Based on the results, grape juice in the fresh juice and 100% juice categories showed highest estimated sugar content (14.04-18.85g/100ml) as shown by all the analysis methods, followed by pineapple juice (10.57-13.85g/100ml); while guava in the category of fresh juice, fruit juice drink and fruit drink appeared to have the lowest sugar content (4.71-10.05g/100ml). Estimated sugar content in fruit drinks products was found to have the highest percentage of deviation from the labeling (40.89%) followed by juice drinks (30.85%) and 100% fruit juice (13.91%). Results showed that most fruit drinks samples contained significantly ($p < 0.05$) higher estimated sugar content compared to the data on nutrition labelling panel. In conclusion, fruit drinks products tend to show higher estimated sugar content compared to other fruit juice categories. There is no apparent pattern in the difference of estimated sugar content between fresh fruit juice and commercial juice but it is dependent on the types of fruits. These findings can be used to advice the public on juice consumption based on their individual nutritional needs. More studies are warranted to further validate and expand the data banks.

C06 Determination of Antioxidant Activity and Content of selected varieties of *Lactuca sativa* L.

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Lettuce is considered as one of the most popular vegetables which is used as one of the main ingredients for salad. The natural antioxidants such as vitamins, phytochemicals

and flavonoids in lettuce are believed to protect the body from degenerative and chronic diseases. Objectives of the study were to determine and compare the total antioxidant activity and content of selected local varieties of *Lactuca sativa* L. Five varieties (Iceberg, Butterhead, Romaine, Green Coral and Red Coral) were subjected to DPPH free radical scavenging assay and Ferric ion reducing antioxidant power assay (FRAP) for determination of total antioxidant activity. Total phenolic content (TPC) and total flavonoid content (TFC) determination were carried out for total antioxidant content. The EC₅₀ values obtained from DPPH free radical assay ranged from 307.26±11.3 to 4485.41±784.4 with Red Coral showing the lowest value indicating it possesses the highest antioxidant capacity among the varieties. Red Coral also showed the highest value in FRAP assay while for the other varieties value's ranged from 48.05±6.7 mg GAE/100gFW to 2135.82±119.2 mg GAE/100gFW with significant differences among the varieties (p<0.05). The TPC of samples were significantly different (p<0.05) and ranged from 4.85±0.4 to 76.05±0.5 with Red Coral having the highest value. Similarly, TFC were also significantly different (p<0.05) with ranging from 2.28±0.24 mg QE/100gFW to 21.96±0.25 mg QE/100gFW. DPPH assay showed high correlation with TPC and TFC (r= -0.879, r= -0.881 respectively) and high correlation also was shown by FRAP with TPC and TFC (r= 0.999, r= 0.998 respectively). Overall, this study shows that Red Coral possesses the highest antioxidant capacity and content among the selected lettuce varieties and consumer are encouraged to choose this variety for better health benefits.

C07 Heavy metals profiles in commonly consumed freshwater fish and shellfish in central region of Peninsular Malaysia

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The objective of this study was to determine the level of heavy metals in freshwater fish and shellfish from Central Region of Peninsular Malaysia. The study was to detect the concentration of heavy metal between flesh, organ and bones of freshwater fish and edible part from shellfish and compare with the permissible value in foods. Seven species of freshwater fish and nine species of shellfish were purchased from the wet market in Klang, Selangor. Microwave digestion system was used for sample digestion and extraction. Flame Atomic Absorption Spectrophotometer (FAAS) was used to determine concentration of cadmium (Cd), chromium (Cr), copper (Cu), Lead (Pb) and zinc (Zn). Cd was not detected in freshwater fish and shellfish and considered negligible. Black tilapia (*Oreochromis mossambicus*) contained highest concentration of Cr (22.438 ± 1.188 mg/kg) in flesh and highest concentration of Cu (35.313 ± 0.438 mg/kg) in organ. Catfish (*Clarias batrachus*) contained the lowest concentration of Cr (3.125 ± 2.25 mg/kg) in flesh and Red tilapia (*Oreochromis spp.*) contained the lowest concentration of Cu (0.125 ± 0.063 mg/kg) and Zn (23.563 ± 0.938 mg/kg) in flesh but contained the highest concentration of Pb (45.750 ± 0.500 mg/kg) in bones. Iridescent shark (*Pangasius hypophthalmus*) contained highest concentration of Zn (150.000 ± 2.25 mg/kg) in bones and lowest concentration of Pb (3.563 ± 1.563 mg/kg) in flesh. For shellfish, bamboo clam (*Ensis directus*) and rotund mystery snail (*Viviparus Intertextus*) contained highest concentration of Cr (10.563 ± 1.500 mg/kg) and Cu (451.833 ± 0.917 mg/kg) respectively. Blood cockles (*Anadara granosa*) contained the lowest concentration of Cr (5.188 ± 1.188 mg/kg) and Cu (6.000 ± 0.813). Blue crab (*Callinectes sapidus*) contained the highest concentration of Pb (21.400 ± 3.650 mg/kg) while giant river prawn (*Macrobrachium rosenbergii*) contained the lowest concentration (13.300 ± 3.950 mg/kg). White leg shrimp (*Litopenaeus vannamei*) contained the lowest concentration of Zn (55.550 ± 0.85 mg/kg) and oyster (*Crassostrea gigas*) contained the highest concentration of Zn (3114.625 ± 61.688 mg/kg).

C08 Proximate and fatty acid composition on selected fruits and vegetables-based fried snacks

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In Malaysia, fruits and vegetables are not only being eaten raw and cooked, it is also being prepared into snack and become a part of daily diet. However, these fruit and vegetable-based fried snacks are yet to be investigated and included in nutrient database. Lack of reliable nutrition information of these snacks put consumers at health risk and urge the investigation of these snacks. This study aimed to determine and compare the proximate and fatty acid composition of selected fruits and vegetables-based fried snacks. All analytical analyses were determined by AOAC Official Methods, except for total available carbohydrate (by-difference), energy content (summation) and fatty acid composition (using a Gas Chromatography). Energy content of fried snacks were calculated based on 4, 4, 9 kcal/g for carbohydrate, protein and fat, respectively. On the wet basis, the snacks were found to have low ash (0.92%-1.76%) and high moisture contents (8.44% - 44.56%). Besides, the snacks were reported to have high carbohydrate content (23.51% - 46.69%) and fat content (17.92% - 39.79%) but low in protein content (5.25% - 6.75%) and total dietary fibre content (0.53% - 1.62%). Selected snacks were found to have high energy, ranged 310 – 550 kcal/100g edible portion. Fatty acid composition of the selected snacks is high in MUFA (73.08%- 75.54%), followed by SFA (15.62%-16.94%) and PUFA (9.41%-9.98%). The results showed a significance difference ($p < 0.05$) in all proximate content but not fatty acid composition. The study indicated that selected snacks are mainly energy contributor due to high fat and carbohydrate contents. Over-consumption of these snacks contributes in excessive energy intake potentially lead to non-communicable disease. Therefore, by referring to the present study, consumer should able to make a better food choice based on their nutritional needs in their daily life.

C09 Proximate and sugar compositions of selected Malaysian raw honeys

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Honey is gaining attention worldwide due to its nutritional and medicinal properties. It has been advocated to substitute refined sugars in the United States because of its nutrient quality. In Malaysia, there are many types of honey, but some are not well differentiated in terms of proximate and sugar compositions. This study determined the proximate and sugar compositions of selected Malaysian raw honeys (*Kelulut*, *Gelam*, wild, pineapple, and *Tualang*) using AOAC Official Methods, in replicates. Manuka honey was used for comparison in the study. Results were expressed as mean \pm standard deviation. Malaysian raw honeys were high in carbohydrates (80.27-82.32%), sugar (62.70-63.67%) and energy (324.18-331.20kcal/100g) contents. Fructose (30.53-32.84%) and glucose (27.97-29.72%) were the main sugars followed by maltose (1.21-1.52%) and sucrose (0.93-1.48%) in these honeys. The Malaysian raw honeys were moderate in moisture content (17.07-19.08%), low in ash (0.17-0.28%), protein (0.24-0.45%) and fat (0.10-0.36%) contents. Dietary fiber

was not found in all samples. Manuka honey was significantly higher in carbohydrate ($87.60\pm 0.04\%$), ash ($0.30\pm 0.01\%$), protein ($0.43\pm 0.00\%$) and energy ($352.75\pm 0.04\text{kcal}/100\text{g}$) contents but significantly lower in moisture ($11.60\pm 0.02\%$) and fat ($0.08\pm 0.02\%$) contents than the Malaysian raw honeys. Sugar content of Manuka honey ($64.19\pm 2.69\%$) was not significantly different from the Malaysian raw honeys. Moreover, values of dietary components for all the samples coincided with the international honey regulations. Generally, the Malaysian raw honeys are of good and comparable quality with Manuka honey. Therefore, the choice of which honey should be based on nutritional value besides personal preferences of the consumer.

C10 Comparison of total phenolic contents (TPC) and antioxidant activities among fresh fruit juices, commercial 100% fruit juices and fruit drinks

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The increasing trend in consumption of fruit juices may due to the fact that fruit juices contain high amount of antioxidant which has been proven to play an important role in human health. Thus, this present study was aimed to compare the differences of total phenolic contents (TPC) and antioxidant activities among fresh fruit juices, commercial 100% fruit juices and fruit drinks. Samples analyzed were consisted of seven types of freshly blended fruit juices (grape, pomegranate, apple, guava, mango, pineapple, orange) and their commercial counterparts. Samples were analysed using Folin-Ciocalteu method, ferric reducing antioxidant power (FRAP) and 2,2-diphenyl-1-picrylhydrazyl (DPPH) assays. All samples were collected in Kuala Lumpur and four replicates were analyzed for each type of sample. Fresh guava juice and commercial guava drinks showed the highest TPC (62.94 to 45.10 mgGAE/100ml), antioxidant activities for DPPH (770.12 to 205.71 $\mu\text{molTE}/100\text{ml}$ and FRAP (843.13 to 320.80 $\mu\text{molTE}/100\text{ml}$) respectively. For fresh juice category, pomegranate surprisingly had the lowest TPC (13.38 mgGAE/100ml) but its commercial 100% counterpart showed the highest value (130.39 mgGAE/100ml). No significant difference in TPC between fresh juices and commercial 100% juices, except for 100% grape and pomegranate juices, which showed higher TPC ($p<0.05$) than their fresh counterpart. Commercial 100% grape, pineapple and orange juices showed higher antioxidant activities than their fresh counterpart, but the difference was not significant. Among three categories of juices, fruits drinks had the lowest TPC and antioxidant activities for all types of fruits ($p<0.05$). TPC was positively correlated to FRAP and DPPH assays ($r=0.947$ and $r=0.898$, $p<0.01$ respectively), while strong positive relationship was also identified between both antioxidant assays ($r=0.961$, $p<0.01$). In conclusion, most commercial 100% fruit juices were found to have higher antioxidant properties, but was not significantly different, as compared to their fresh juices. Commercial fruit drinks were not good sources for antioxidants.

C11 Bioaccessibility of chlorogenic acid (5-caffeoylquinic acid) in selected instant white coffee

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Coffee is one of the most favourite beverages in the world after water and tea. Increasing demand for coffee had led to invention of instant coffee for convenience purpose. In Malaysia, white coffee is well known and popularly consumed. Chlorogenic acid is the most abundant polyphenol in coffee which shown to provide numbers of beneficial health properties related to its potent antioxidant activity as well as hepatoprotective, hypoglycemic and antiviral activities. The objectives of this study were to determine and compare the chlorogenic acid content of selected instant white coffee in different stages of *in vitro* digestion. The samples (black coffee, white coffee, 2 in 1 white coffee, 3 in 1 white coffee and low fat & low sugar white coffee) were subjected to *in vitro* gastropancreatic digestion with its chlorogenic acid content determined before digestion, after simulated gastric and after gastropancreatic digestion. The total chlorogenic acid content of samples analysed ranged from 118.08 ± 0.63 $\mu\text{g/ml}$ to 345.74 ± 38.4 $\mu\text{g/ml}$ with 2 in 1 white coffee showed the highest content. During the simulated digestion, significant reduction of chlorogenic acid can be seen both after pepsin and pancreatin-bile treatment. Macronutrients content of samples were shown to influence the recovery (%) of chlorogenic acid after simulated gastric digestion either is protecting (fat) or inhibiting (carbohydrates/sugar/protein) it. During stage of pancreatic digestion, macronutrients were not shown to influence the recovery (%) of chlorogenic acid in the samples as bioaccessibility (%) of chlorogenic acid was shown to be similar except 2 in 1 white coffee with lower bioaccessibility (%). Overall, this study showed that bioaccessibility (%) of chlorogenic acid was significantly affected by both gastric and pancreatic digestion. Macronutrients content could be potential influencing factors at the stage of gastric digestion. However, stability of chlorogenic acid could also be a confounding factor.

C12 Antioxidant capacity, total phenolic content and total flavonoid content of *Pluchea indica* and its application in biscuits

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Medicinal plants are cultivated for their aromatic, pungent or other desirable substances used for medicinal purposes. This study was undertaken to measure antioxidant capacity, total phenolic content (TPC) and total flavonoid content (TFC) of *Pluchea indica* and the effect of incorporation of *Pluchea indica* (control, 15g, 30g) into biscuits, in 70% ethanol extract. Folin-Ciocalteu Reagent assay was performed to determine TPC whereas aluminum chloride colorimetric assay was used for determination of TFC. The antioxidant capacity was determined by using two methods which are: DPPH free radical scavenging assay and FRAP assay. TPC of *Pluchea indica* was 8.28 ± 0.03 mg GAE/g of dry weight. TFC of *Pluchea indica* was 5.88 ± 0.21 mg QE/g dry weight. The EC_{50} value of DPPH assay for *Pluchea indica* was $2.42 \mu\text{g/ml}$. For ferric reducing power, the total antioxidant activity of *Pluchea indica* was 94.20 ± 2.02 mM $\text{FeSO}_4/100\text{g}$ of dry weight. For pearson correlation, the results demonstrated highly positive correlation coefficient between the total phenolic content and the EC_{50} value of the ethanol extract which was highly significant ($p < 0.05$). Total phenolic content in the 70% ethanol extract exhibited a very strong positive correlation with FRAP ($r = 0.969$, $p = 0.001$). Significant linear correlations were found between total flavonoid content and EC_{50} values of DPPH scavenging activity ($r = 0.936$, $p = 0.005$). On the other hand, the correlation coefficient between TFC and FRAP was high ($r = 0.987$) and statistically significant ($p = 0.000$). For application of *Pluchea indica* in biscuits, sample biscuits contained a greater variety of phenolic and flavonoid content and had good scavenging ability on DPPH radicals and chelating ability on ferrous ions (30g > 15g > control). Overall, *Pluchea indica* biscuits could be developed as a food with more effective antioxidant properties.

C13 Determination of total phenolic and gamma-aminobutyric acid (GABA) content, and phenolic composition in brown rice and germinated brown rice snacks

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Rice is the major staple food for many Asian countries, including Malaysia. Recently, brown rice (BR) and germinated brown rice (GBR) gain greater interest due to their higher nutritional value than white rice. BR and GBR are rich in phenolic compounds and gamma-aminobutyric acid (GABA) which are believed can fight against chronic diseases. Besides consuming as staple food, BR and GBR can be processed into snacks such as puffed rice. This study aimed to determine the stability of total phenolic content (TPC), GABA content and phenolic composition in BR and GBR after being puffed. Besides that, the effect of germination on TPC, GABA content and phenolic composition in BR was also determined. The TPC of samples was evaluated by using the Folin-Ciocalteu Assay, while the GABA and phenolic composition were determined using Ultra Performance Liquid Chromatography (UPLC) system. Results showed that germination had reduced the TPC in BR significantly and this might due to decreasing of major soluble phenolic compounds 6'-*O*-(*E*)-feruloylsucrose and 6'-*O*-(*E*)-sinapoylsucrose. However, GABA content was increased in BR after germination. Meanwhile, puffing technique had reduced the TPC in BR, but not in GBR. It was explained that puffing might stimulate the hidden phenolics in GBR that released during the germination. Furthermore, puffing technique also reduced the GABA content in both BR and GBR due to the thermal degradation of glutamic acid. For the phenolic composition, germination could only increase the content of vanillic and syringic acid, but not for gallic, caffeic, p-coumaric and ferulic acid in BR as some of the phenolic acids may leach into the soaking medium during germination. Yet, puffing enabled the increment of all phenolic acids in GBR which was attributed to the dissociation of phenolic compounds caused by puffing. In conclusion, puffed GBR was shown to have better nutritional quality than puffed BR.

C14 Proximate and sugar compositions of selected glutinous rice-based foods

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In Malaysia, there are scarcities of data regarding glutinous rice-based foods. This leads to the inability of health professional such as dietitian and nutritionist as well as consumers to know the nutrient contents in this type of foods. Thus, this study aimed to determine and compare the proximate and sugar composition of selected glutinous rice-based foods (*Badak Berendam, Puteri Mandi, Pulut Berinti and Pulut Dakap*). The proximate composition was determined by using AOAC Official Methods. The sugar composition was determined by using HPLC-RI method, while the total available carbohydrate was calculated by using difference method. Energy content was calculated based on the energy content of fiber, carbohydrate, protein and fat which were 2, 4, 4, and 9 kcal/g respectively. All food samples in this study were conducted in duplicates or triplicates for each analysis. The glutinous rice-based foods in this study had low ash content (0.34%-0.75%), fiber content (1.70%-5.12%), protein content (4.75%-6.96%) and fat content (2.73%-10.27%), moderate carbohydrate content (13.66%-39.85%), but had high moisture content (50.43%-64.57%)

and energy content (179 kcal-223 kcal). For the sugar composition, five sugars namely, glucose, fructose, sucrose, maltose and lactose were analyzed in this study. All food samples had low glucose content (0.65%-4%) and fructose content (1.1%-4.35%), but had moderate sucrose content (7.06%-34.27%). However, there were no maltose and lactose content found in all food samples. The total sugar content for all food samples in this study was moderate (9.37%-42.02%). The finding from this study indicates that the glutinous rice-based foods contain low ash, fiber, protein and fat, moderate carbohydrate and sugars, high moisture and energy contents. In conclusion, the selected glutinous rice-based foods in this study should be consumed in moderation in order to prevent non-communicable diseases.

C15 Proximate and sugar composition of selected tuber-based traditional kuih

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The high availability and low price of tuber-based traditional *kuih* make it a favorite snack among Malaysian. However, the lack of reliable nutrient composition of these snacks put consumers on nutritional risks as there is no reference for them to practice a healthy snacking habits. This study aimed to determine and compare the proximate and sugar composition of selected tuber-based traditional *kuih* namely *Keledek Goreng*, *Ubi Kayu Goreng*, *Getuk Ubi Kayu*, *Kuih Talam Ubi Keledek* and *Kuih Keladi*. All the analysis were performed according to AOAC Official Methods except for available carbohydrate content which calculated based on 'by-different' and sugar composition which determined by High Performance Liquid Chromatography. All the analysis were conducted in one to three independent experiments and in duplicate or triplicate for each experiment. Total energy content was calculated by the summation of the multiplication of protein, fat, available carbohydrate and fiber content by 4,9,4 and 2 kcal/g respectively. The samples were found to have high moisture content (36.64-60.44%) and low ash content (0.62-1.39%) on wet weight basis. Meanwhile, the samples were reported to have high fat content (6.22-21.16%), high available carbohydrate content (20.78-36.66%), low protein content (2.34-6.58%), moderate fiber content (2.35-6.39%) and high total sugar content (3.72-31.71%) on dry weight basis. The samples were found to have high energy content (185.60-339.28 kcal/100 g edible portions). The mean values of the results were significantly differences ($p < 0.05$) among the samples in one-way ANOVA. Different ingredients and cooking methods used to prepare the snacks were the main factors for the variation in their nutrient composition. The over-consumption of the traditional *kuih* as snacks may results in excessive energy intake and other health consequences. Therefore, consumers should avoid overconsume these snacks and make a healthier snacks choice based on their nutritional needs.

C16 Amino Acid composition in selected cereal and cereal products in the Malaysian Market

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Protein plays a crucial role in almost all biological processes and amino acids are the building blocks of it. In order to develop amino acid data on the Malaysian Food Composition

Database (FCD), the objective of this current work is to determine protein and amino acid content of cereal and cereal products that are commonly consumed by Malaysian population. The criteria for buns selection was based on the data provided from Malaysian Adult Nutrition Survey carried out between October 2002 and December 2003. A total of 27 cereals and cereal based products were sampled from local supermarkets in Klang Valley using stratified sampling. Crude Protein content was determined using Kjeldahl and Dumas method. Fifteen amino acids (isoleucine, leucine, lysine, phenylalanine, tyrosine, threonine, valine, arginine, histidine, alanine, aspartic acid, glutamic acid, glycine, proline and serine) were determined using Ultra Performance Liquid Chromatography (UPLC) with Photodiode Array (PDA) Detector. The range of protein content in cereals and cereal products were 5.65-12.72 g/100g. The cereal and cereal products with the highest protein and amino acids content was egg noodle whilst the lowest amount of protein and amino acids content was biscuit cream filled. This amino acid database can be used by health professionals and public to choose foods based on updated and correct nutrient composition of foods to accommodate their own needs.

C17 Comparing the antioxidant activity, total phenolic content and flavonoid content between various types of *Strobilanthes Crispus* tea and commercial green tea

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Strobilathes crispus tea is well known for its potential as anticancer and also high in antioxidant properties. However, the processing method such as thermal treatment is reported to have variable effects on total phenolic content and antioxidant activity of plant samples. The objective of this study was to compare the antioxidant activity, total phenolic content and flavonoid content of various types of *S. crispus* tea and commercial green tea. The fermented and unfermented tea from *S. crispus* were developed according to *Camellia sinensis* and *Camellia theifera* preparations for black and green tea respectively. In addition, each of fermented and unfermented tea from *S. crispus* was treated into two types of drying process which were oven and microwave drying. DPPH free radical scavenging assay and Ferric reducing/antioxidant power (FRAP) assay were used to determine the antioxidant activities. While, Folin-Ciocaltue method and aluminium calorimetry method was used to estimate the total phenolic content and flavonoid content respectively. The result for antioxidant activity (DPPH and FRAP assay) showed the same trend which was Premium green tea > *S. crispus* unfermented microwave tea > *S. crispus* unfermented oven tea > 2 years *S. crispus* unfermented tea > *S. crispus* fermented microwave tea > *S. crispus* fermented oven tea. Interestingly, antioxidant activity of *S. crispus* unfermented oven tea and 2 years *S. crispus* unfermented tea were not significantly different. *S. crispus* fermented microwave tea and *S. crispus* fermented oven tea were also not significantly different. For total phenolic and flavonoid content, the result showed that 2 years unfermented *S. crispus* tea had significantly different from both types of *S. crispus* fermented tea. In conclusion, the commercial green tea exhibited the highest antioxidant activity, total phenolic and flavonoid content among all teas tested.

C18 Determination of physical characteristics and macronutrients of *Persea americana* fruit

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Avocado (*Persea americana*) is gaining worldwide recognition as healthy and nutritious fruit. However, local (Malaysian) avocado fruit has not been fully utilized. Avocado fruit cultivar available locally and imported Hass variety avocado of about the same ripeness were analyzed for physical characteristics and proximate analysis in this study. The physical characteristics of avocado fruits including shape, size, color, volume, weight, surface area and sphericity were determined. The standard AOAC method was used to determine the proximate analysis. The data was analyzed using SPSS (version 20.0) software. Generally, the results show that there were no significant differences ($P > 0.05$) between the local and imported avocado fruits in most physical characteristics. However, local avocado fruits (0.22 kg) were slightly heavier compared to imported avocado fruits (0.17 kg). The major diameter was also longer in local avocado fruits (9.67 cm) in comparison with imported avocado fruits (9.17 cm). The surface area was 191.2 cm² for local while imported avocado fruits had surface area of 173.2 cm². In terms of colour, local avocado fruits (42.09) was significantly lighter (L^* value) ($P < 0.05$) than imported avocado fruits (26.03). The moisture content of local avocado fruits (88.32%) was significantly higher ($P < 0.05$) than imported avocado fruits (70.37%). Imported avocado fruits on the other hand had higher content of protein (1.35%) and fat (19.19%) compared to local avocado fruits (0.56% and 6.74% of protein and fat, respectively). The carbohydrate content was 4.33% and 8.93% for local and imported avocado fruits, respectively. Imported avocado fruits (213.77 kcal/100g) had more than twice as much calorie as local avocado fruits (80.24 kcal/100g). As a conclusion, local and imported avocado fruits show little differences in physical characteristics, while proximate analysis values illustrates quite vast differences, with most of the parameters measured had significant differences ($P < 0.05$).

C19 Quantification of sugar profiles in popular instant premix powder drinks marketed in Malaysia

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Instant premix powder drinks, also commonly known as 3-in-1 powder drinks, have been increased in popularity among consumers of all age groups due to its cheap price, convenience and long shelf-life. An increase consumption of these instant premix drinks is of particular concern because of high sugar contents. But, limited information on sugar composition profiles analysis has been documented for the instant premix drinks marketed in Malaysia. Hence, the main objectives of present analysis were to quantify the sugar composition profiles of instant premix powder drinks that are commonly available in Malaysia and secondly, to compare the differences of sugar contents between a HPLC analysis values and nutrition label on the packaging. A total of 42 selected samples consisted of 15 coffee drinks, 9 tea drinks, 7 chocolate malt drinks, 6 cereal-based drinks and 5 combination of tonic and herb drinks were sampled from various locations. Quantification of sugar composition profiles of these drinks was determined using the high performance liquid chromatography (HPLC) with refractive index (RI) detector. Results showed that total sugar

contents of coffee, tea, chocolate malt drinks, cereal and tonic/herb were ranges between 28 to 337g/100g, 34 to 78g/100g, 19 to 99g/100g, 57 to 429g/100g and 58 to 77g/100g, respectively. Cereal-based drinks had the highest sugar contents (Mean=318.3), followed by coffee (Mean=89.0), tonic/herb (Mean=65.9) and tea (Mean=57.3), while chocolate malt drinks contributed to lower amount of sugars (Mean=44.0). Sugar composition analyses found that all samples contained sucrose (100%; n=42), followed by glucose (95.2%; n=40) and maltose (81.0%; n=34). Comparisons of sugar levels of all samples of similar category found that total sugars of Brand X was significantly higher than other brand of similar types assessed (all, $p<0.001$). Brand Y was significantly higher than other types of drinks such as ginger tea and lemon tea (all, $p<0.001$). Analysis of nutrition labelling on packaging revealed that only 69.0% of samples (n=29) contained total sugar contents labelling. Comparisons between total sugar levels from HPLC analysis values and nutrition label showed that 69% (n=20) of these drinks had higher total sugar contents analysed by HPLC compared to the total sugar levels on their label, with 45% (n=9) had mean differences of $\geq 30\%$. Meanwhile, 31% (n=9) of them had total sugars content more than amount obtained from HPLC analysis. These findings suggest that instant premix beverages marketed in Malaysia are commonly high in sugars. Consumption of these instant premix beverages should be replaced with other healthier alternative beverage choices in order to prevent excessive weight gain and other metabolic-related disorders.

C20 Protein content and amino acids profile of coconut's milk (*Pati santan*) in Malaysia

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Coconut's milk is the word used to describe the liquid obtained from the mechanical or manually press of the coconut's meat usually with or without added water. In Malay word the coconut's milk is known as '*Pati Santan*' which usually sold as a fresh liquid form in the local market. The composition of coconut's milk depends on the amount of water used for the extraction, affecting significantly physicochemical properties. Therefore, the aim of this study was to determine the protein content with amino acids profile of Malaysian coconut's milk sold by local vendors. Samples were obtained from three locations in Hulu Langat in Malaysia and were analysed by High Performance Liquid Chromatography (HPLC) with fluorescence detector. Results of the study showed that Malaysian coconut's milk possess high proteins content (3.40 ± 0.59). This milk exhibited a significantly lower ($P<0.05$) essential amino acids (EAA) with mean percentage of 26.82% than non-essential amino acids (NEAA) (73.18%). As overall, proline NEAA was the highest value with mean percentage of 20.26% and histidine was the lowest with mean percentage of 1.66%. Results also showed that leucine was the highest value among the EAA with mean percentage of 5.41% whereas, histidine was the lowest value. In contrast, tyrosine was the lowest value among the NEAA with mean percentage 2.65% and proline was the highest. Thus, it can be conducted that *Pati santan* is a source of the plant protein that is considered to have relatively favourable amino acid composition, where protein deficiency is frequently a problem because of the high cost of animal proteins.

C21 Comparing physicochemical properties, antioxidant capacity and total phenolic content between homemade and commercial dates (*Phoenix Dactylifera* L.) vinegar

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Dates (*Phoenix dactylifera* l) is a popular dried fruit being consumed in Malaysia especially during Ramadan month. Previous studies evidenced that dates possessed antioxidant properties. Various dates' by-products have been produced to provide alternative food choices such as dates' vinegar. However, limited study has been carried out on dates by-products especially dates' vinegar. The aims of this study is to determine and compare the physicochemical properties, antioxidant properties, and total phenolic content of both homemade and commercial dates' vinegar, hence providing additional scientific evidence of its potential. Preparation of homemade dates' vinegar was done through spontaneous and simultaneous fermentation cycle process of semisoft and soft dates' cultivars at 28°C for 60 days. Physicochemical properties such as pH, total sugar content and total titratable acidity of homemade and commercial dates' vinegar were then studied. Folin-ciocalteu reagent was used to examine their total phenolic content while hydrogen peroxide scavenging test and metal chelating test were used to screen the antioxidant capacity. Both homemade and commercial dates' vinegar showed significant differences in physicochemical properties ($p < 0.05$). Total phenolic content of dates' vinegar ranged from 281.17 GAE/L to 641.17 GAE/L with significant differences noted between homemade and commercial dates' vinegar ($p < 0.05$). Hydrogen peroxide scavenging activity of semisoft dates' vinegar [310.20 AAeq ($\mu\text{g/ml}$)], soft dates' vinegar [200.06 AAeq ($\mu\text{g/ml}$)] and commercial dates' vinegar [190.81 AAeq ($\mu\text{g/ml}$)] did not show any significant difference ($p > 0.05$). There was no significant correlation between hydrogen peroxide scavenging activity and total phenolic content of dates' vinegar ($p > 0.05$). As regards to metal chelating test, only the homemade vinegar showed metal chelating property with values of 0.34 ± 0.10 and 2.90 ± 0.03 for semisoft and soft dates' cultivars respectively. Statistical test showed a significant correlation between metal chelating rate and total phenolic content ($p < 0.05$). Data revealed that homemade dates' vinegar showed generally higher antioxidant properties than commercial dates' vinegar and different significantly in terms of physicochemical properties.

C22 Sodium and Potassium Contents in Selected Salts and Sauces

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Salts and sauces are frequently used by Malaysian at table or during cooking in daily life. However, majority of them are high in sodium which is adverse to human health. In contrast, potassium is one of the minerals that critical to human body as it can effectively compensates the effect of sodium in increasing blood pressure. The present study was undertaken to determine and compare the sodium and potassium contents in selected salts (Table Salt, Coarse Salt, French Sea Salt, Himalayan Pink Salt and Bamboo Salt) and sauces (Light Soy Sauce, Sweet Soy Sauce, Chili Sauce, Tomato Sauce and Mayonnaise).

The sodium and potassium contents of samples were determined using Flame Atomic Absorption Spectroscopy in duplicate. Findings of the present study showed that the sodium content of salts was highest in Table Salt ($35870.0 \pm 28.3 \text{ mg}/100\text{g}$) and lowest in French Sea Salt ($31235.0 \pm 5013.4 \text{ mg}/100\text{g}$) whereas the potassium content was highest in Bamboo Salt ($399.4 \pm 7.9 \text{ mg}/100\text{g}$) and lowest in Table Salt ($43.7 \pm 30.7 \text{ mg}/100\text{g}$). However, there were no significant differences in sodium content between salts. Bamboo Salt was significantly higher in potassium than other salts. The ranking of sodium and potassium among sauces were same in which Light Soy Sauce contained the highest amount ($4402.0 \pm 1127.1 \text{ mg}/100\text{g}$ and $395.4 \pm 60.3 \text{ mg}/100\text{g}$) and Mayonnaise contained the least ($231.3 \pm 181.0 \text{ mg}/100\text{g}$ and $63.6 \pm 5.2 \text{ mg}/100\text{g}$). Both sodium and potassium contents of Light Soy Sauce were significantly higher than other sauces. In a nutshell, the salts are commonly high in sodium content regardless of the types. Bamboo Salt is a better salt instead of other salts in terms of the potassium level. In sauces, although Light Soy Sauce is high in potassium; however, its high sodium may offset the beneficial effect of potassium.

C23 Variability of selenium and mercury molar ratios in seafood of West Peninsular Malaysia

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Seafood are cheap supply of protein containing omega-3 fatty acids and provide many health benefits such as reducing cholesterol levels and incidence of heart disease, blood pressure and stroke. Humans may be exposed to mercury (Hg) through seafood consumption hence it is important to understand the factors that influence uptake of this metal. Co-occurrence of selenium (Se) with mercury has been suggested to ameliorate the effects of Hg. This study aims to determine the variation of Se:Hg molar ratios within species and the usefulness of Se:Hg molar ratios for risk communication. A total of 8 species of molluscs ($n=15$), 6 species of crustaceans ($n=13$) and 30 species of fish ($n=83$) were collected from selected landing ports and wholesale market of West Peninsular Malaysia. Samples were acid digested using microwave and concentrations of Hg and Se were measured using Inductively Coupled Plasma-Mass Spectrometry (ICP-MS). There were intra-specific and inter-specific variations in Se:Hg molar ratios. The Se:Hg ratios ranged from 3.5 for barramundi to 30.4 for pomfret. Selenium health benefit value (SeHBv) above 1 are largely protective for neurotoxic mercury effects and were highest in pomfret (18.3), followed by stingray (13.1) and tuna (12.82). Se levels in this study were high enough to provide protection for Hg toxicity but there is a need to understand variations. Wide range in Se:Hg molar ratios complicate the interpretation for use in risk management and communication. More information is needed on Se:Hg interactions and mutual bioavailability as well as the relationship between molar ratios and health outcomes.

Group D: Clinical Nutrition / Intervention Trials

D01 The simultaneous effects of sleep deprivation and coffee caffeine consumption on lipids profile of Iranian adult men

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Sleep deprivation and caffeinated coffee on its own have been reported to adversely affect lipids profile. The objective of this study was to determine the simultaneous effects of sleep deprivation and coffee caffeine consumption on the levels of serum triglycerids, HDL, LDL and total cholesterol among healthy Iranian adult men. Forty-two moderate coffee consumers (≤ 3 cups/day), healthy male good sleepers with a Pittsburgh Sleep Quality Index (PSQI) ≤ 5 , aged 20-40 y were recruited using PSQI questionnaires, interview, anthropometric measurements, and 24-h recalls. Subjects were randomly assigned into three groups to participate in a randomized controlled crossover trial involving three treatments with two-week washout periods. Each treatment comprised of three nights of deprived sleep (4 hrs. in bed) plus 3 \times 150 cc/cup of boiled water, treatment 1 (control group), treatment 2, decaffeinated coffee (No added sugar, 99.9% caffeine-free), and treatment 3, caffeinated coffee (No added sugar, 65 mg caffeine/cup). The levels of TG, HDL-C and TC were measured at the end of each treatment using enzyme assays, while LDL-C was calculated using Friedewald's Formula. The analysis of variances found no statistical differences ($p > 0.05$) between lipids profile of deprived sleep subjects on all three treatments performed. Pairwise comparisons test indicated that when coupled with sleep deprivation, caffeinated coffee showed no significant changes ($p > 0.05$) in serum lipids as compared to decaffeinated coffee. Given the individually effects of coffee caffeine consumption on circulating serum levels, some probable interactions following simultaneous administration of sleep deprivation and caffeinated coffee appeared to attenuate the impacts of coffee caffeine on serum lipids. The findings of this study showed that intake of caffeinated coffee in healthy habitual coffee drinkers manipulated lipids levels within a range, which was no more harmful in individuals who normally had short sleep duration.

D02 Prevalence of constipation among children 1 to 3 years attending child care centers in Selangor and its associated factors

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Limited is known about childhood constipation in Malaysia. Hence, the study aimed to determine the prevalence of constipation among children 1 to 3 years attending child care centers in Selangor and its associated factors. A total of 237 parent-child respondents from 25 child care centers in Selangor participated in the study. Children involved in the study comprised 128 males and 109 females, with a mean age of 2.47 ± 0.75 years. Anthropometric measurements of the children were assessed and body weight status was classified using the WHO Growth Standards. Constipation was assessed using the Rome III criteria. A set of pre-tested self administered questionnaires were completed by the parents or guardians.

Results showed that about one in five (17.3%) of the children had constipation (Male: 15.6%, Female: 19.3%; $\chi^2 = 0.546$, $p > 0.05$). Stunting is more common than overweight, as there were 23.6% of the respondents were stunted and severely stunted while 4.2% were overweight children. Most of the children (87.3%) failed to achieve the recommended daily intake of fruits and vegetables. On average, children experienced 1.26 ± 1.18 stressful events in the last three months. Poorer body weight status (BAZ, HAZ, WAZ) was found in constipated children (-0.03 ± 0.90 , -1.60 ± 1.20 , -1.03 ± 0.92) when compared with non-constipated children (0.35 ± 0.96 , -1.11 ± 1.14 , -0.45 ± 1.00) ($t = -2.312$, -2.407 , -3.270 ; $p < 0.05$). Children who failed to achieve the recommended intake of fruits and vegetables (Constipated children: 97.6%, Non-constipated children: 85.2%; $\chi^2 = 3.632$, $p < 0.05$) and experienced stressful events (Constipated: 92.7%, Non-constipated children: 75.0%; $\chi^2 = 7.600$, $p < 0.001$) were more prevalent of having constipation problem. No differences were found in socio-demographic factors, fluid intake, physical activity, and age of initial complementary feeding between these two groups. Constipation is a common health issue among children attending child care centers. There is a need to prevent constipation by considering the impacts of nutrition and stress on the children.

D03 Association of body fat with dental caries among selected adults in Klang Valley

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Dental caries has a high prevalence all around the world. Nutritional intake was evidenced to fuel the development of dental caries especially sugar intake hence, impacting the oral health status of the individual. This cross-sectional study was conducted to determine the relationship between dental caries with nutritional status. The study involved 153 adults living in Klang Valley where socio-demographic characteristics and anthropometry measurements were taken. Dental caries was assessed using the decayed, missing and filled teeth (DMFT) index while the physical activity level used International Physical Assessment Questionnaire (IPAQ). The respondents corresponded to the study's criteria which were mostly from the age of 18 to 45 years old (75.8%). The study was dominated by Malays (63.4%), married respondents (68.8%), those who only completed up to secondary school (57.6%), employed for wages (53.6%) and in low income group (42.5%). The anthropometry measurements included body mass index (BMI) ($25.73 \text{ kg/m}^2 \pm 5.27$), visceral fat area (9.05 ± 6.01), body fat percentage ($29.95\% \pm 7.55$) and waist circumference (WC) ($84.78 \text{ cm} \pm 13.38$). The prevalence of dental caries was found to be high (90.8%) (DMFT 7.38 ± 6.35). Most of the respondents (61.4%) were found to be physically active. There was no significant relationship between body mass index, visceral fat area and abdominal obesity with physical activity level except for body fat percentage with physical activity level ($r = -0.196$, $p < 0.05$). A weak positive relationship was found between visceral fat area (VFA) and DMFT ($r = 0.235$; $p < 0.05$). In conclusion, the study indicated that visceral fat is associated with dental caries. Future studies are needed to explore more nutritional factors in dental caries incidences.

D04 Determination of plasma concentration of vitamin C and total antioxidant capacity in patients undergoing chronic hemodialysis and its associated factors

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Oxidative stress related to uremia-induced inflammation is common in hemodialysis (HD) patients whilst antioxidants are important protective factors. Therefore, this study aimed to determine plasma concentration of vitamin C (VC) and total antioxidant capacity (TAC) in HD patients and its associated factors. A cross-sectional study was conducted in Hospital Kuala Lumpur by convenient sampling (n=51 patients) based on the inclusion criteria. VC and TAC were determined using HPLC and FRAP assay, respectively. Dietary intake was estimated using 7-day diet records. Pearson's correlation coefficient (r) and chi-square (X^2) tests determined association between variables. Forty-seven patients (53.2% male; 46.8% female) with a mean age of 44.6 ± 12.9 years old completed the study and had a mean dialysis vintage of 11.7 ± 7.6 years. BMI of majority of patients (66.0%) was below the recommendation of ≥ 24 kg/m². High serum phosphate (>1.45 mmol/L) and C-reactive protein (>3.0 mg/L) were observed in 53.2% and 31.9% of patients, respectively. Hypertension (36.1%) was the most common co-morbidity. About 42.6% of patients were taking VC supplements and majority (72.3%) had inadequate VC intake (<60 mg/day). TAC were significantly associated with serum albumin ($r=.305$; $p=.037$). Plasma VC showed significant association with serum total protein ($r=.334$; $p=.022$) and potassium intake ($r=.296$; $p=.044$). However, there was no significant association was observed between VC intake and both plasma VC ($r=.250$; $p=.090$) and TAC ($r=.079$; $p=.600$). In conclusion, plasma VC level is associated with potassium intake, reflecting overall fruits and vegetable intake. Plasma TAC is positively correlated with nutritional marker (albumin) and negatively correlated with inflammatory marker (CRP).

D05 Meal-replacements and weight loss in diabetes: rationale and design of a randomized controlled trial

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Meal-replacement plans produce significant weight loss and positive health outcomes in patients with obesity. Few studies have been conducted in patients with diabetes and less so in Asian countries. Asians differ from Westerners in culture and ethnicity, both of which influence dietary change including the use of meal-replacements. Thus, we conducted a study to assess the effect of meal-replacements on weight loss, micronutrient status and metabolic control among Malaysian patients with obesity and Type 2 Diabetes Mellitus. This is a one-year, parallel, three-arm, randomized controlled trial. Subjects in the MR1 and MR2 arms were to respectively replace one and two main meals with the provided product. The CD arm consumed no meal-replacements. All subjects were prescribed an equivalent hypo-caloric diet and received similar diet and lifestyle counselling from the same study dietitian over nine scheduled individual meetings. Data on body composition changes, dietary intake, physical activity, dietary adherence data, blood pressure, blood laboratory markers, and medication were collected at the scheduled meetings. Assuming an attrition rate of 17%, the calculated sample size was 20 in each arm (effect size of 0.88; 0.05 significance; 80% study power). Enrollment was expanded due to a greater than anticipated attrition rate. A total of 122 patients from University Hospital in Kuala Lumpur, were screened for eligibility and 70 were randomized into one of the three arms: MR1 (n=20); MR2 (n=30); and CD (n=20). The mean age, Body Mass Index, and average duration of diabetes of the subjects were 47.5 ± 9.5 years old; 32.7 ± 0.4 kg/m²; and 6.4 ± 4.9 years. This study is expected to conclude in August 2015 and generate outcomes of meal-replacement use in local settings.

C.E.R.G.A.S school-based intervention pilot study: Effectiveness on nutrition knowledge, attitudes and practices among overweight and obese adolescents.

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Nutrition knowledge is an important component that helps foster healthy dietary behaviours. This study aimed to evaluate the effectiveness of the C.E.R.G.A.S (*Ceria, Respek, Gigih, Aktif, Sihat*) programme on nutrition knowledge, attitudes and practices (KAP) among overweight and obese adolescents. Two secondary schools from Selangor were selected randomly, and each was assigned as intervention (IG; n=52; mean age 13.5 years old) and control (CG; n=68; mean age 13.8 years old). This was a multi-component intervention programme, where IG was exposed to a combination of eight sessions of aerobic and resistance exercise and nutrition education programme conducted over two days of intensive camp; and CG did not receive any intervention. A validated nutrition KAP questionnaire was used to assess KAP at one month before and one month after the 8-week intervention (IG and CG) and again at six months post intervention (IG only). Intention-to-treat analysis was employed whereby the “last observation carried forward” method was used in the subjects who were absent in the follow-up sessions. Subjects from both IG and CG were not significantly different in all baseline parameters, except for nutrition practices, whereby CG had significantly higher mean score than IG ($p<0.01$). Results indicated that the C.E.R.G.A.S programme significantly improved the nutrition KAP in the IG ($p<0.001$) while the scores for nutrition KAP decreased significantly in the CG ($p<0.001$) during the same time frame. At six months follow-up, the scores for nutrition knowledge ($p<0.001$), attitude ($p<0.001$) and practices ($p<0.01$) in IG remained significantly higher than baseline. These findings indicate that the C.E.R.G.A.S programme may be effective in improving nutrition KAP among overweight and obese adolescents. A full-scale intervention study will be conducted to confirm the findings of this pilot study.

D07 Insights into the knowledge, attitude and practices of head and neck cancer survivors at otorhinolaryngology outpatient clinic of UKM Medical Center

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Cancer treatment will cause problem specifically difficulties in swallowing and xerostomia. Therefore, the objective of this study was to examine knowledge, attitude and practices of Head and Neck cancer (HNC) patients after completed treatment. A cross-sectional study was conducted among 42 HNC survivors comprising of 64.3% male and 35.7% female who comes for follow-up treatment at otorhinolaryngology outpatient clinic of UKMMC. Data on socio-demography, anthropometry and disease related information was collected. Knowledge, attitude and practices (KAP) were assessed using validated questionnaire which comprised of 20 items for knowledge with 7 domains, 6 items for attitude and 5 items for practices. Majority of subjects were Chinese (71.4%), Malay (23.8%) and Indian (4.8%) with mean aged of 58.1 ± 12.4 years. About 16.7% were underweight while 69% were in a normal BMI. Majority of survivors had Nasopharynx cancer (NPC) (47.6%), were at stage IV of cancer (41.0%) and mean duration of completed treatment were 3.2 ± 3.6 years. Overall mean score for knowledge were in the lower normal range ($53.7 \pm 17.2\%$) due to low score from domain on symptoms (28.6%), managing side-effects (37.7%) and causes of cancer (38.9%). In aspect of attitude, majority of the subjects (85.7%) agreed that cancer treatment was painful and burdening their family (66.7%). The survivors believed that cancer can be prevented (50%) and recur after completion of treatment (40.5%). Based on practices, cancer survivors of stage I and II consumed more than 2 liters of water a day [OR 0.112, CI 0.01-0.71] while survivors of stage III and IV go for dental check-up every 6 month [OR 8.05, CI 1.68-38.44]. In conclusion, there is a gap in knowledge, attitude and practices among HNC survivors in managing treatment side effects. Hence, continuous education after treatment and during follow-ups should be emphasized to enhance the survivors' knowledge and practices which may contribute to better quality of life.

D08 Personal UV behaviour and estimated cutaneous synthesis of vitamin D among adults in Kuala Lumpur during Southwest and Northeast Monsoons

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We obtain most of our vitamin D requirements from sunlight exposure but personal UV behaviour may influence the amount of cutaneous synthesis of vitamin D. This study aims to compare personal UV behaviour and to estimate cutaneous synthesis of vitamin D among adults living in Kuala Lumpur during Southwest Monsoon (SW, July-Oct 2013) and Northeast Monsoon (NE, Nov-Feb 2014). A total of 117 healthy adults (74% female) aged 19-51 years participated in this study. Body surface area (BSA) exposed, sunlight behaviour, skin type and dietary vitamin D intake were assessed through an online questionnaire. Participants wore polysulphone film badges for one week to assess standard erythema dose (SED) and subsequently to estimate cutaneous synthesis of vitamin D. There was a trend of reduced time spent outdoors in NE monsoon on weekdays (linear-by-linear association test, $p=0.07$). The majority of participants (SW 62%; NE 60%) reported exposing their face and hands when outdoors with no significant difference between seasons ($p=0.84$). Similarly, there were no significant differences between proportion of users of sunblock (SW 24%; NE 22%, $p=0.74$) and sunlight protection factor (SPF) products (SW 43%; NE 42%, $p=0.91$). Daily SED was higher during the SW [median(IQR)=0.20(0.11, 0.30)] than NE [0.14(0.07, 0.23), $p<0.01$]. However, estimated cutaneous synthesis of vitamin D (incorporation of skin type, BSA and daily SED) showed no difference between both seasons (SW=119(60, 260) IU/day; NE 95(52, 222) IU/day) (median). Dietary vitamin D was 1.8 (0.6, 2.9) $\mu\text{g}/\text{day}$ in SW and 1.6 (0.7, 2.9) $\mu\text{g}/\text{day}$ in NE monsoons with no seasonal differences ($p=0.52$). In

conclusion, there was no evidence of UV behavioural changes between seasons although sunlight exposure was lower during NE monsoon. The extent of low estimated cutaneous synthesis of vitamin D among these healthy adults living in Kuala Lumpur is of concern.

D09 Development of a mobile game application (NutriNinja™) to promote physical activity and healthy eating knowledge among adolescents

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Game-based learning can be a potential aid to deliver health education. The aim of this study was to develop and evaluate acceptability of smartphone interactive learning application (app) that can be used to promote physical activity and healthy eating knowledge among adolescents. This study was conducted in three phases. Phase 1 was needs assessment among 88 adolescents age from 13 to 15 years old in Selangor; whereby all answered a questionnaire and 10 adolescents were interviewed to explore the type and preference of multimedia interactive learning tools among adolescents. Phase 2 was the development of smartphone game app called NutriNinja™, which combines pedometer function with healthy eating knowledge. The player needs to physically walk for a certain number of target steps to obtain a clue with nutritional information. Phase 3 was the evaluation on acceptability of NutriNinja™ app among 34 individuals, including adolescents, teachers and parents. Tool to Evaluate Material used in Patient Education (TEMPtEd) questionnaire was used to evaluate the readability and acceptability of the game components. Mean score for app content among adolescents and adults were, respectively, 16.6±2.1 and 16.2±1.8 out of 21, motivating principle 4.6±1.1 and 4.7±1.5 out of 6, literacy 8.3±1.5 and 7.3±1.2 out of 12, layout and typography 9.6±1.2 and 11.2±1.0 out of 12, graphic 7.0±1.5 and 8.2±1.3 out of 9, and the feasibility of game app 12.6±1.4 and 12.3±1.8 out of 15. Mean total score of TEMPtEd for adolescents and adults were 58.9±6.6 and 59.8±2.8, respectively, which categorized the game as moderately acceptable among respondents. In conclusion, NutriNinja™ in its current form is moderately suitable for educating adolescents to be more physically active as well as to practice healthy eating in order to achieve healthier lifestyle. Thus, further development of this smartphone educational game app to enhance its motivating factor is necessary prior to evaluation of the effectiveness of NutriNinja™.

D10 Correlations of body weight status among severe mental illness patients

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A cross-sectional study aimed to determine the correlations of body weight status among severe mental illness patients attending psychiatric outpatient clinic in Hospital Kuala Lumpur and Hospital Kajang was conducted. A total of 168 outpatients (45.8% males and 54.2% females) with a mean age of 41.9±11.9 years completed information on socio-demographic background, clinical characteristics (type and duration of illness) and various lifestyle factors (physical activity level, smoking behavior, alcohol consumption, and nutrition supplement used) in a face-to-face interview. The diagnosis of severe mental illness was made based on the Mini International Neuropsychiatric Interview (MINI). Body weight and height were measured by using appropriate equipments and standard procedures. Majority of the subjects were Chinese (42.9%), single (50.0%) and middle age adults (55.4%). About

65.5% of them were having abnormal body weight status in which 5.4% were underweight, 33.9% were overweight and 26.2% were obese. More males (70.2%) were overweight and obese than females (51.7%), while more females (6.6%) were underweight than males (3.9%). Sex ($\chi^2=4.597$, $p=0.032$), physical activity level ($\chi^2=6.585$, $p=0.037$) and smoking behavior ($\chi^2=5.984$, $p=0.050$) were significantly associated with body weight status. Severe mental illness patients who were males, with low level of physical activity, and smokers were more likely to be overweight and obese than their counterparts. For clinical characteristics, types of illness ($\chi^2=0.112$, $p=0.945$) were not significantly associated with body weight status. However, illness duration was positively correlated with BMI ($r=0.188$, $p=0.015$). In conclusion, three in five of the severe mental illness patients were overweight and obese. This study suggests that patients with severe mental illness should receive nutrition education in promoting healthy body weight status.

D11 The association of adiponectin and leptin with objectively measured physical activity among adults: a brief review

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Strong evidence shows that physical inactivity increases the risk of many adverse health conditions, including major non-communicable diseases such as coronary heart disease, type 2 diabetes, and various cancers as well as shortens life expectancy. There are many mechanisms that may act through the effects of physical activity on health outcomes which resulting changes in circulating adiponectin and leptin. However studies on the association between self-reported physical activity level and adipokines found inconclusive results. Therefore this study aims to compile and analyse existing scientific evidence regarding the association between adiponectin and leptin with objectively measured physical activity among adults. Medline, PubMed, and Scopus databases were searched using specific keywords for articles related to the association between objectively measured physical activity on adiponectin and leptin. Only cross sectional studies among adults between year 2000 to 2015 were included. Studies that used subjective assessment of physical activity were excluded. A total of 1274 papers were retrieved from initial search. Only six studies met the inclusion criteria ($n=961$). Five studies showed the effects of objectively measured physical activity on adiponectin and four studies on leptin. All four studies involving leptin showed a weak to moderate inverse association ($r=0.213-0.443$) and for adiponectin, three out of five studies showed a weak to moderate positive association ($r=0.31-0.438$) with objectively measured physical activity. Lower serum leptin and higher serum adiponectin concentration were associated with increased level of physical activity. As a conclusion, there is consistent evidence on the association between objectively measured physical activity and adipokines especially on leptin. More well-designed cross sectional studies using a larger sample size are needed to confirm these findings.

D12 Effectiveness of nutritional education to improve nutritional status among institutionalized elderly

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The objective of this study was to examine the effectiveness of nutritional education towards public institutionalized elderly in Malaysia. A community trial study consisting of three phases was conducted within 6 months period. Two public institutional homes were randomly allocated to intervention and control group. Eighty seven residents of each

group were examined at baseline and follow up visits at 3 months and 6 months. Kitchen cooks in the intervention group received nutritional education comprised of lecture, video presentation and standardized booklet on food preparation as reference material, whereas cooks in the control group continued existing standard food preparation by institution. Main outcome measures were dietary intake based on Dietary History Questionnaire (DHQ) and nutritional status based on Mini Nutritional Assessment Short Form (MNA-SF). Statistical analyses were conducted to examine significant changes in selected nutritional parameters after each course between groups. The results indicated that there were significant difference ($p < 0.001$) between both groups with respect of certain nutrients intake; calcium, selenium, thiamin, riboflavin, niacin and vitamins (A, C, D and E). Mean intake of these nutrient values were found higher in intervention group compared to control group. However, there was no significant differences in MNA-SF scores (which represent nutritional status) between intervention group and the control group ($p < 0.001$). This education programme suggested that there was improvement in several nutrient intakes, but unable to exert positive influence to the improvement of nutritional status of elderly. A more detailed and multidimensional nutritional education should be conducted to improve “at-risk” individuals, to root for its causes and best course of action.

D13 Evaluation of diabetes-related distress in type 2 diabetes patients in Iran

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Diabetes-related distress and depression in patients with type 2 diabetes mostly remain undetected and uncured. These lead to poor diabetes management. The aim of this cross-sectional study was to determine level of diabetes-related distress in type 2 diabetic patients in Iran. A total of 100 type 2 diabetic patients (61 female, 39 male), aged between 37 to 66 years were recruited from the out-patient diabetes clinic of Golestan hospital, Ahvaz, Iran. Problem Areas in Diabetes (PAID) questionnaire was used to assess diabetes-related distress of these subjects. Beck Depression Inventory (BDI) and Diabetes quality of life questionnaire (DQoL) were also used to determine depression and evaluate quality of life respectively. Clinical parameters including glycated hemoglobin A1c level (HbA1c) were also measured. The mean diabetes duration was 4 ± 1.4 years. The mean age of men and women was 56 ± 6.1 and 53.4 ± 6.7 years respectively. Nearly half of the patients (53%) had HbA1c levels $\leq 7\%$, as an acceptable value for glycemic control in *diabetes patients*. The mean total DQoL was 54.6 ± 2.4 and mean PAID score was 33.7 ± 4.5 . Subjects reported “some or extreme problems” most frequently in diabetes-related worry (77.5 ± 7.05) and impact of treatment (57.7 ± 3.9) dimensions of DQoL. Prevalence of mild mood disturbances was 46% among subjects based on BDI questionnaire. The results showed that subjects with HbA1c less than 7% reported significantly better quality of life and less emotional distress. Overall, patients stated moderate level of distress in related to diabetes; therefore much more appropriate strategies and education are needed to improve diabetes patient’s care in Iran.

D14 *Polygonum minus* extract improved mood and quality of life in middle aged women: a randomized, double-blind, placebo-controlled study

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Polygonum minus (*P. minus*) or locally known as “kesum” in Malaysia is rich in flavonoids and a good source of antioxidants beneficial for reducing oxidative stress and lipid peroxidation in neuronal membrane. However, its beneficial effect on mood, cognition and quality of life yet to be discovered. The objective of this study is to evaluate the effect of *P. minus* extract (LineMinus™) on cognitive and psychosocial status among middle-aged women in Klang Valley, Malaysia. Thirty five healthy women aged 35-59 years were enrolled in this randomized, double-blind, placebo-controlled study. Participants were randomise into intervention (n=17) and control group (n=18). A dosage of two capsules consisting of either 250mg *P. minus* or placebo of 100mg maltodextrin each were taken daily for six weeks. Cognitive test included Digit Span, Rey Auditory Verbal Learning Test (RAVLT), Comprehensive Trail Making Test (CTMT), Wechsler Abbreviated Scale of Intelligence (WASI) and CNS Vital Sign (CNSVS); psychosocial status as measured using Profile of Mood States (POMS) and quality of life using 36-Item Short form Health Survey (SF-36) were assessed within the three visit of study. The mean of mood parameters (tension, depression, anger and Total Mood Disturbance) demonstrated a significant improvement from baseline to 6 weeks among intervention group ($p < 0.05$ for all parameters). Similar trend was noted in intervention group for energy/fatigue, social functioning and general health from the quality of life assessments ($p < 0.05$). Mean score of Digit Span, CTMT, WASI (IQ performance and IQ full) and three domains of CNSVS (cognitive flexibility, processing speed and executive function) improved significantly in both intervention and control groups. No adverse effects were reported after 6 weeks of *P. minus* supplementation. *P. minus* extract is safe to consume with potential benefits to improve mood and quality of life.

D15 An intervention towards weight reduction in an open community

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The prevalence of overweight and obesity in Malaysia has a rising trend. Obesity poses a major risk for serious diet-related non-communicable diseases, including diabetes mellitus, cardiovascular disease, hypertension, stroke and certain forms of cancer. Considering the seriousness of the above consequences in both monetary and non-monetary aspects, an intervention programme had been undertaken in an open community at Kota Damansara. The purpose of this study was to encourage and promote weight loss through dietary

modification and increasing physical activity among a group of women. All the women were screened for their body mass index (BMI). A total of 48 women residents who were in the category of overweight and obesity (BMI > 30.0kg/m²) were recruited for this intervention. The participants were educated on dietary modifications required to support weight reduction. They were also required to attend the aerobic sessions conducted for them. Body weight was recorded bi-weekly and percentage of body fat was also measured before and after the intervention. A consistent participation rate of 30% was achieved throughout the three month intervention. BMI reduction was observed in the target population from 33.75 ± 7.77 kg/m² to 32.88 ± 8.04 kg/m². In addition, the body fat of the participants was shown to decrease from 40.75% to 39.70%. There is a significant difference (p<0.05) in both the BMI and percentage body fat of the participants from this intervention. Hence, the intervention programme of longer period should be implemented for a more effective, efficient and sustainable outcome.

D16 Satiety scores and glycemic index of selected beverages with beta-glucan

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This study was conducted to determine the satiety scores and glycemic index of beverages with β-glucan in the market. The two samples chosen were commercial product *Biogrow Oat BG22* and *Biolife BG Barley 25*. Subjects were selected based on some essential criteria and Three-Factor Eating Questionnaires (TFEQ). The subject must not suffer from any kind of diseases; have blood glucose level less than 110 mg/dL (6.2 mmol/L) during fasting and normal body weight and eating habits. A total of 30 subjects took part in the test to determine the satiety scores and 10 of it were selected to take part in the determination of glycemic index of the beverage samples. Labelled magnitude satiety scale was used to determine the satiety scores before and after consumption the samples according to their perception of fullness or hunger. Glycemic index (GI) was determined by measuring finger prick blood glucose of the subjects. The incremental area under the curve (iAUC) was used to calculate GI values for each sample and was compared with the reference food. All data was analyzed using independent t-test and analysis of variances (ANOVA) to determine the significant difference (p<0.05) from the data obtained. As for satiety scores, results showed no significant difference between samples on 0 minute but there was significant different after subjek took their sample (15-180 minutes). Every sample reach their optimum satiety scores at 15 minutes and then decrease with time. *Biogrow Oat BG22* was the sample with highest satiety scores due to higher sample weight and protein content compared to *Biolife BG Barley 25*. Besides, blood glucose level after taking glucose drinks reach optimum level (9.9 mmol/L) at 30 minutes while *Biolife BG Barley 25* and *Biogrow Oat BG22* reach optimum level at 45 minutes with the value 7.9 mmol/L and 6.4 mmol/L respectively. GI for *Biolife BG Barley 25* was 79 (high GI) while *Biogrow Oat BG22* was 32 (low GI).

D17 Anthropometric characteristics among newly diagnosed breast cancer and healthy women: A case-control study

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The objective of this study was to compare the anthropometric measurements between newly diagnosed breast cancer patients and healthy women. These breast cancer patients

were recruited from the Oncology Clinic, Hospital Universiti Sains Malaysia (HUSM). The healthy women consist of employees of Universiti Sains Malaysia, Kelantan. A total of 74 newly diagnosed breast cancer patients aged 20-59 years old were compared with 51 healthy women. Socio-demographic data were obtained by using a standard questionnaire. Anthropometric assessments include body weight, height, waist and hip circumference, body fat percentage and visceral fat. The mean±SD age of breast cancer and healthy women were 48±8 years old and 39±9, respectively. The prevalence of overweight and obese in breast cancer patients were 31.0% and 19.7%, respectively. While the prevalence of overweight and obese among healthy women group were 35.3% and 17.6%, respectively. The findings of abdominal obesity status showed 62.2% (95%CI:83.62-88.87) in breast cancer group and 45.1% (95%CI:76.30-82.22) in healthy women group. Among all anthropometric measurements, only waist circumference was found to be significantly different between the groups (p=0.001). The breast cancer patients group had higher waist circumference (86.25±9.12 cm) compared to the healthy women (79.26±10.54 cm). This study highlights the higher prevalence of abdominal obesity among the newly diagnosed breast cancer patients indicating the possible link between abdominal obesity and the development of breast cancer.

D18 Food craving, night eating syndrome and GDM status among Pregnant Women Attending Health Clinics in Batu Pahat, Johor

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GDM is associated with increased fetal and maternal morbidity. The objective of this study was to compare food craving and night eating syndrome between GDM and non GDM pregnant women attending health clinics in Batu Pahat. This cross sectional comparison study included 108 pregnant women in third trimester which consist of 54 GDM pregnant women and 54 non GDM pregnant women. The GDM status of the respondents were screened based on their medical record books. The respondents were interviewed on their socio-demographic background, reproductive history, dietary practice, food craving condition and night eating syndrome. Mean of fasting blood glucose for GDM pregnant women were 5.3 ± 0.428 mmol/L while 4.4 ± 0.373 mmol/L for non GDM pregnant women. Mean of post prandial blood glucose for GDM pregnant women were 8.2 ± 0.434 mmol/L while 5.2 ± 0.358 mmol/L for non GDM pregnant women. No significant difference was detected in socio-demographic background and reproductive history between GDM and non GDM pregnant women. There were significantly differences in (total energy intake, fat intake and protein intake) between GDM and non GDM pregnant women ($p < 0.05$). The mean total scores of food craving different between GDM and non GDM pregnant women ($t=7.011$, $p < 0.05$) indicating that GDM pregnant women had greater state of food craving compare to non GDM pregnant women. In addition, there was significant difference in night eating syndrome between GDM and non GDM pregnant women ($t=5.294$, $p < 0.05$). The results indicated that food craving and night eating syndrome were important factors associated with GDM status. Hence, early prevention efforts should be targeted on food craving and night eating syndrome in controlling blood sugar level.

D19 Development of healthy education intervention – “Eat Right, Be Positive About Your Body and Live Actively” (EPaL) for Malaysian adolescents

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The ‘Eat Right, Be Positive About Your Body and Live Actively’ (EPaL) Program is a health education intervention which aimed to promote healthy lifestyle in preventing overweight and disordered eating among secondary school adolescents. This school-based intervention program applied peer education as a strategy to convey the knowledge and skills to the adolescents. Educational module, activity book and related educational materials were developed for this program and interactive activities were included in each topic. The EPaL module was developed to provide knowledge and skills to peer educators in order to conduct the healthy lifestyle education activity to the other students. There were eight topics in the EPaL module covering three main components, which are healthy eating, positive body image and active lifestyle. The peer educators were chosen among Form 2 students to conduct the intervention sessions to their peers from Form 1 and Form 2. Two phases of 2-day training-of-trainers (TOTs) were carried out for the selected peer educators and aimed to empower the peer educators with the knowledge and skills on healthy lifestyle. The peer educators received the peer educator training kits that comprise the EPaL module, activity book and related educational materials, while the participants received the activity book and related educational materials. The implementation of the topics are conducted during their co-curriculum period at the school hall in a club called *Kelab EPaL* under the supervision of teachers and research team. It is hoped that the EPaL program will improve their nutritional and health status, which in turn preventing overweight and disordered eating problem.

Notes



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= more than
3 g oat beta-glucan



Travel Pack
(9 g x 30 sachets)
2 sachets (= 18 g)
= more than
3 g oat beta-glucan

* FSQD; MOH. Guide to Nutrition Labelling & Claims (as at Dec 2010).

References:

1. Jenkins et al. 2002. European Journal of Clinical Nutrition.
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