33rd Scientific Conference of the Nutrition Society of Malaysia

Theme

Investing in Nutrition: *Act Now*

Programme & Abstracts

24 – 26 July 2018
Hotel Istana, Kuala Lumpur

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Contents

Conference Secretariat

VERSACOMM (263773-W)

12-A, Jalan PJS 8/4, Mentari Plaza, Bandar Sunway,
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Tel: 03-5632 3301 Fax: 03-5638 9909
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President's Welcome Message

Tee E Siong, PhD
President,
Nutrition Society of Malaysia
president@nutriweb.org.my

On behalf of the Organising Committee, I welcome you to the 33rd Scientific Conference of the Nutrition Society of Malaysia (NSM). We extend a special welcome and appreciation to YBhg Dato' Dr Hj. Azman bin Hj. Abu Bakar, the Deputy Director General of Health (Medical) for graciously consenting to declare open this Conference.

The main causes of death and morbidity in the country for the past 3 decades have been diet-related non-communicable diseases (NCDs) such as heart disease, diabetes and cancers. Risk factors of these NCDs, associated with over-nutrition, especially obesity, hypertension and high blood cholesterol have risen to alarming levels. Childhood obesity has also become another major cause of concern among policy makers and health care professionals. At the same time, nutrition problems associated with undernutrition exist among specific segments of the population. Micronutrient deficiencies are significant problems afflicting young children and women of reproductive age.

Various action plans and programmes have already been formulated to address these problems in the country, notably the series of National Plan of Action for Nutrition Malaysia (NPANM). In spite of these action plans formulated since 1996, it is important to determine why the severity of the problem has been declined. It is imperative that the current NPANM III (2016-2025) be fully implemented, addressing the previously identified shortcomings, namely lack of intersectoral and multi-stakeholder coordination and financial shortfall to deliver the identified programmes. It is vital to have the highest political and government commitment to garner all stakeholders to systematically implement NPANM III. To this end, there must be concerted efforts among relevant government ministries and agencies, and working in collaboration with the private sector, academic institutions, professional bodies and non-governmental organisations.

Recognising the severity and urgency of the situation, the NSM has selected the theme of this conference as: "Investing in Nutrition: Act Now". Specific symposia sessions of the conference are dedicated to provide a platform for all stakeholders to share research and intervention activities that address the double burden of malnutrition. NSM is of the belief that preventive healthcare measures should be emphasised and investing in nutrition now is crucial to ensure a healthy generation of Malaysians in the future.

I take this opportunity to place on record our sincere gratitude to all who have contributed to the success of this Conference which includes all speakers and poster presenters, all participants as well as our corporate partners.

I trust everyone will take full advantage of this opportunity provided and have a fruitful conference.

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.

Established in 1985, the Nutrition Society of Malaysia (NSM) is a non-profit scientific organisation that facilitates networking among its 500 professional members and engages in the following scientific and community nutrition promotion activities to achieve its goal.

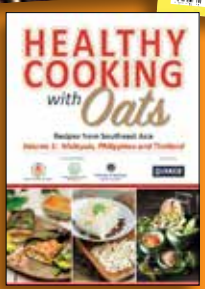
For more information, visit our website:
www.nutriweb.org.my

Our Activities

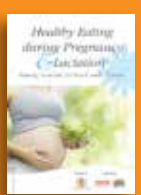
- Organise annual scientific conferences
- Conduct scientific update sessions
- Advice to government health & regulatory authorities & scientific bodies
- Research on specific community groups
- Lead the Southeast Asia Public Health Nutrition (SEA-PHN) Network
- Conduct nutrition promotion programmes in collaboration with other professional organisations and corporate companies
  - specific target groups especially women, infants and children (eg Healthy Kids, Mi-Care, MyNutriBaby, Positive Parenting)
  - community-based promotion programmes eg Nutrition Month Malaysia, Probiotics Education Programme
- Establish a comprehensive and authoritative website on nutrition for Malaysians

Our Major Publications

- Malaysian Journal of Nutrition
- Berita NSM (newsletter)
- Series of recipe books
  - Healthy Cooking with Oats. Recipes from SEA. Vol 1. Malaysia, Philippines, Thailand
  - 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)
- Various educational booklets and leaflets on dietary guidelines and specific foods
- Nutrition Month Malaysia booklets on healthy eating and active living (www.nutritionmonthmalaysia.org.my)



Junior Chef Cookbook Vol 1. Let's Play Healthy Cooking, Nutritionists' Choice Cookbook (Vol 1 & 2), Resipi Sihat, Pilihan Bijak (Vol 1 & 2), Healthy Cooking with Oats



Healthy Eating During Pregnancy & Lactation

Wonders of Whole Grains

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

Malaysian Dietary Guidelines leaflets

Breastfeed with Confidence

Baby's First Bites

Healthy Spoonfuls for Toddlers

Acknowledgements

The Nutrition Society of Malaysia gratefully acknowledges contributions from the following to the 33rd Scientific Conference:

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

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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 and corporate partners to promote 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.

Good Nutrition Key to Healthy Children

Multi-country initiative of

SEA-PHN
Southeast Asia Public Health Nutrition Network

Jointly implemented by

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

Recognising the importance of preventing the double-burden of malnutrition from a young age, the Southeast Asia Public Health Nutrition (SEA-PHN) Network has initiated a multi-country nutrition education initiative called Good Nutrition – Key to Healthy Children (GNKHC). It aims at empowering school children with appropriate nutrition knowledge to enable them to adopt healthier eating habits and be physically active. This will be implemented via a specially designed nutrition module developed by member societies/associations of the SEA-PHN Network in Indonesia, Malaysia, Philippines, Thailand and Vietnam. The module, comprising nine topics on the basics of healthy eating and active living, will be implemented by the school teachers in selected schools, trained to conduct the lessons and carry out various interactive activities.

This initiative is supported by unconditional educational grants from corporate partners of the Network, namely BENEO GmbH, Danone, DuPont Nutrition & Health, Mondelez International (from 2018), Nestle (until 2017), PepsiCo (Quaker), and Tate & Lyle (till 2017).

Teaching Materials of the GNKHC Nutrition Module

Teacher's Guidebook and Student's Workbook

Learning Slides

Materials for Interactive activities

Parent's leaflet

Pre-Conference Symposium

PRE-CONFERENCE DAY: TUESDAY, 24 JULY, 2018

1700 hrs Registration

PRE-CONFERENCE SCIENTIFIC SYMPOSIUM
Nutrition Labelling and Claims: Regulatory Updates in Malaysia
Chairperson: Tee E Siong
Nutrition Society of Malaysia

1730 hrs **Nutrition labelling regulations in Malaysia**
Fatimah Sulong
Nutrition Division, Ministry of Health Malaysia

1805 hrs **Nutrition labelling and claims: regulatory updates in Malaysia**
Norrani Eksan
Food Safety and Quality Division, Ministry of Health Malaysia

1840 hrs **Status of nutrition labelling and claims in Southeast Asia – an overview**
Jocelyn Wong
ILSI SEA Region

1915 hrs Summaries by Chairperson

1930 hrs Refreshment

End of Pre-Conference

Official Opening

CONFERENCE DAY 1: WEDNESDAY, 25 JULY, 2018

0730 hrs Registration

OFFICIAL OPENING
Mahkota II Grand Ballroom

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

0910 hrs **Speech and official opening by**
YBhg Dato' Dr Hj. Azman bin Hj. Abu Bakar
Deputy Director General of Health (Medical)

- Presentation of NSM Undergraduate and Postgraduate Prizes
- Presentation of NSM Publication Prizes

0945 hrs **Tour of Trade Exhibition/Scientific Posters by invited guests**

Refreshment

Poster Session: presenters in attendance for discussion

Scientific Programme

CONFERENCE DAY 1: WEDNESDAY 25 JULY, 2018

KEYNOTE ADDRESS
Chairperson: Mohd Ismail Noor
Taylor's University

1030 hrs **National strategies and programmes to promote nutritional wellbeing of Malaysians – challenges and way forward**
YBhg Dato' Dr Hj. Azman bin Hj. Abu Bakar
Deputy Director General of Health (Medical), Ministry of Health Malaysia

SYMPOSIUM 1 : Why Invest in Nutrition?
Chairperson : Norimah A Karim
Universiti Kebangsaan Malaysia

1115 hrs **Dietary pattern, gestational weight gain and risk of gestational diabetes mellitus**
Zalilah Mohd Shariff
Department of Nutrition and Dietetics, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia

1135 hrs **Nutritional status of primary school children in Malaysia**
Roseline Yap Wai Kuan
School of Biosciences, Taylor's University, Subang Jaya

1155 hrs **Non-communicable disease (NCD) risk factors among adults in Malaysia**
Muhammad Fadhli Mohd Yusoff
Institute for Public Health, Ministry of Health Malaysia

1215 hrs **Nutritional status of the elderly in Malaysia: past, current and future**
Hanis Mastura Yahya
Nutritional Sciences Program, Centre for Healthy Ageing and Wellness, Faculty of Health Sciences, Universiti Kebangsaan Malaysia, Kuala Lumpur

1235 hrs **Lunch Break / Poster Viewing / Trade Exhibition**

Poster presenters in attendance for discussion

SYMPOSIUM 2 : Investing in Nutrition
Chairperson : Rokiah Don
International Medical University

1400 hrs **Ensuring infant & young child nutrition in Malaysia**
Rusidah Selamat
Nutrition Division, Ministry of Health Malaysia

1420 hrs **An urgent need to invest in promoting healthy nutrition and lifestyle among school children**
Norimah A. Karim
Faculty of Health Sciences, Universiti Kebangsaan Malaysia, Kuala Lumpur

1440 hrs **Promoting nutrition and physical activity: weight management programme Trim & Fit**
Muhammad Asyraf bin Ismail
Health Department of Federal Territory Kuala Lumpur & Putrajaya

1500 hrs **Nutrition of the elderly: programmes to promote healthy ageing**
Suzana Shahar
Dietetics Program, Centre for Healthy Ageing and Wellness, Faculty of Health Sciences, Universiti Kebangsaan Malaysia, Kuala Lumpur

Meet the Expert Session
Chairperson : Tee E Siong
Nutrition Society of Malaysia

1525 hrs **Theme: Career as a nutritionist: what the future holds**

Panelists:

1. Wong Mei Ching
   Group Corporate Nutrition Manager, Nestlé (Malaysia) Berhad

2. Rusidah Selamat
   Deputy Director (Nutrition Policy and Planning)
   Nutrition Division, Ministry of Health Malaysia

3. Norimah A. Karim
   Head and Professor of Human Nutrition,
   Faculty of Health Sciences, Universiti Kebangsaan Malaysia,
   Kuala Lumpur

1630 hrs **Refreshment / Trade exhibition**

SYMPOSIUM 3 : Young Researchers' Symposium
Chairperson : Wong Jyh Eiin
Universiti Kebangsaan Malaysia

1650 hr **Does CERGAS programme improve body composition and anthropometric measurements in overweight/obese adolescents?**
Lau Xiao Chuan, Poh BK, Ruzita AT, Hazizi AS and Ng LO
Nutritional Sciences Programme, School of Healthcare Sciences, Faculty of Health Sciences, Universiti Kebangsaan Malaysia, Kuala Lumpur

1705 hrs **Higher fast food consumption and poor attitude towards healthy meal preparation are risk factors for childhood obesity/overweight in Kuala Lumpur, Malaysia**
Ng Choon Ming, Koo HC, Yap RWK, Chong PN and Satvinder K
Department of Food Science and Nutrition, Faculty of Applied Science, UCSI University, Kuala Lumpur

1720 hrs **Evaluation of school-based Healthy Lifestyle Program (HLP) for primary school children in Batu Pahat District, Johor**
Teo Choon Huey, Chin YS, Lim PY, Zalilah MS and Shahril Azian HM
Department of Nutrition and Dietetics, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia, Serdang

1735 hrs **Effects of 16 weeks vitamin D supplementation on serum 25-hydroxyvitamin D [25(OH)D] and parathyroid hormone (PTH) among women: randomized clinical trial of efficacy**
Melissa Leong En Ying , Chong HZM, Khor GL and Loke SC
Division of Nutrition and Dietetics, International Medical University, Kuala Lumpur

1750 hrs **Food wastage in Malaysian public hospitals and the reasons behind it**
Nur Farhana Aminuddin, Vijayakumaran RK and Shariza AR
Nutrition and Dietetics Programme, School of Health Sciences, Universiti Sains Malaysia, Kubang Kerian

1805 hrs **End of Day 1**

CONFERENCE DAY 2: THURSDAY, 26 JULY, 2018

SYMPOSIUM 4 : Industry Contributions in Investing in Healthy Nutrition
Chairperson : Tee E Siong
Nutrition Society of Malaysia

0900 hrs **Shaping the future of foods: food and nutrition leadership behind the scenes**
Cyndy Au
Regional Director, Regulatory & Scientific Affairs (Asia Pacific), DuPont Nutrition & Health

0945 hrs **Effective ingredient choices for a prevention-oriented nutrition in obesity and diabetes mellitus – The evidence for prebiotic chicory root fibres and Palatinose™**
Goh Peen Ern
Manager Nutrition Communication, BENEO Institute, BENEO Asia-Pacific

1030 hrs **Refreshment / Trade exhibition**

1100 hrs ***Lactobacillus casei* Shirota (Lcs) effects on human health beyond digestive health (mental and immune health)**
Akito Kato
Manager of Gastrointestinal Function Research Laboratory, Basic Research Department, Yakult Central Institute, Japan

SYMPOSIUM 5a : Nutrition Research Updates
Chairperson : Zaitun Yassin
Nutrition Society of Malaysia

1150 hrs **Anaemia in pregnancy women attending antenatal care clinic in Cameron Highlands**
Suwaibah Binti Abd Hadi
District Health Office, Cameron Highlands

1200 hrs **Calcium intakes among milk drinkers and non-milk drinkers in prepubertal children aged 9 to 11 years old from low income families in Kuala Lumpur – the PREBONE-Kids study**
Wong Soon Yee
Division of Nutrition & Dietetics, School of Health Sciences, International Medical University

1210 hrs **Self-efficacy and home food availability is associated with healthy meal preparation practices in Kuala Lumpur children**
Satvinder Kaur
Faculty of Applied Sciences, UCSI University

1220 hrs **Dietary Quality of postmenopausal Chinese women in Kuala Lumpur and Selangor**
Chan Kai Sze
Department of Nutrition and Dietetics, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia

1230 hrs **Lunch**

1330 hrs **Poster Viewing / Trade Exhibition**

Poster presenters in attendance for discussion

1400 hrs **Sunnah intermittent fasting influence endocrine marker and oxidative pathway among mild cognitive impairment of older adults**
Asheila Meramat
Programme of Nutritional Science, School of Healthcare Sciences, Faculty of Health Science, Universiti Kebangsaan Malaysia

1410 hrs **Effectiveness of Kelulut honey in improving the neurocognitive functions of middle-age Malay women**
Chan Boon Keng
Nutritional Sciences Programme, Centre of Healthy Ageing & Wellness, Faculty of Health Sciences, Universiti Kebangsaan Malaysia

SYMPOSIUM 5b : Nutrition Research Updates
Chairperson : Roseline Yap Wai Kuan
Taylor's University

1425 hrs **Mother and Infant Cohort Study (MICOS): study rationale and preliminary findings on vitamin D levels among third-trimester Malaysian pregnant mothers**
Chin Yit Siew
Department of Nutrition & Dietetics, Faculty of Medicine & Health Sciences, Universiti Putra Malaysia

1435 hrs **Improved anthropometric and metabolic profile in Malaysian adults – A 6 month dietary intervention with 30% calories from protein**
Soma Roy Mitra
School of Biosciences, Faculty of Science, University of Nottingham Malaysia Campus

1445 hrs **Drinking water salinity and the associated risk of raised blood pressure in young reproductive-aged women in coastal Bangladesh: a cross-sectional study**
Syed Mahfuz Al Hasan
Department of Public Health, Faculty of Medicine, Kagawa University, Japan

1555 hrs **Dietary acid load and risk of diabetes mellitus among postmenopausal Chinese women**
Lim Sook Yee
Department of Nutrition and Dietetics, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia

1505 hrs **Association between sleep disturbance and lipid profile in Malay women with low vitamin D levels**
Ng Chiat Yin
School of Healthy Aging, Medical Aesthetics, Regenerative Medicine, Faculty of Medicine and Health Sciences, UCSI University

1515 hrs **The relationship between education, occupation, and family support with exclusive breastfeeding (case study in Perak Timur Public Health Center Surabaya)**
Khansa Muthiah
Department of Epidemiology, Faculty of Public Health, University of Airlangga, Indonesia

SYMPOSIUM 5c : Nutrition Research Updates
Chairperson : Chin Yit Siew
Universiti Putra Malaysia

1530 hrs **Infant and young child feeding amongst Penan children in rural Sarawak: qualitative findings**
Bong Mee Wan
Faculty of Health Sciences, Universiti Kebangsaan Malaysia, Kuala Lumpur

1540 hrs **Dietary intake, nutritional status and caries experiences among cerebral palsy children in Kelantan: a community intervention study**
Rathmawati Binti Ahmad
School of Dental Sciences and Cerebral Palsy Research Cluster, Universiti Sains Malaysia, Kelantan

1550 hrs **Association between attraction to physical activity and physical activity level among primary school children**
Wu Suet Kei
Nutritional Sciences Programme & Centre for Community Health, Faculty of Health Sciences, Universiti Kebangsaan Malaysia, Kuala Lumpur

1600 hrs **Associations between fluid intake, hydration, Body-Mass-Index and cognitive function among adolescents in Selangor, Malaysia**
Serene Tung En Hui
Department of Food Science & Nutrition, Faculty of Applied Sciences, UCSI University

1610 hrs **Vitamin D deficiency and its associated factors among older adults in Alborz province, Iran**
Maryam Zarei
Department of Nutrition and Dietetics, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia

1620 hrs **Metabolic responses to isomaltulose by Malaysian Chinese adults: A pilot study**
Chan Chee Shan
School of Postgraduate Studies, International Medical University

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

1640 hrs **Young Researchers' Symposium and Best Undergraduate Poster Prize**

1700 hrs **Refreshment/Conference ends**

Early Nutrition eAcademy Southeast Asia

eLearning for Healthcare Professionals

The Early Nutrition eAcademy Southeast Asia (ENeA[SEA]) develops **innovative eLearning** for practicing **doctors** in the field of **early nutrition.**

EU, Thai and Malaysian partners are jointly developing science-based education, tailored to the needs of the Southeast Asian region. Our goal is to offer the latest recommendations for everyday practice and maximise outreach to the wider healthcare community. (HCPs e.g. obstetricians, gynaecologists, paediatricians).

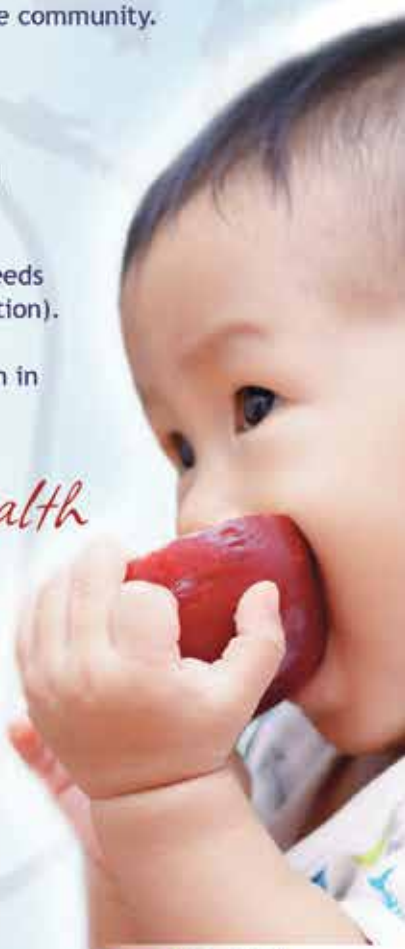
ENeA[SEA] addresses this need by offering:

- a curriculum dedicated to the specific public health concerns and professional requirements in Southeast Asia
- targeted eLearning modules in English language
- Individualized training packages to specifically meet the user's needs using an automated content matching processes (mass customization).

ENeA[SEA] is designed for professional sub-specialisation and integration in pre- and post-graduate study programmes.

By working together we can improve health and wellbeing of all individuals!

www.enea-sea.eu



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In collaboration with

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Conference Information

REGISTRATION COUNTER

Registration Counter is located at **Foyer, Ballroom Level, Hotel Istana, Kuala Lumpur**. Opening hours of the Registration Counter:

- 25 July 2018: 7.45 am – 6.30 pm
- 26 July 2018: 8.30 am – 12.00 pm

SCIENTIFIC SESSIONS

All scientific sessions shall be held in the **Mahkota II Ballroom, Ballroom Level, Hotel Istana, Kuala Lumpur**.

POSTER PRESENTATIONS

Scientific poster Presentations shall be held at **Function Room Safir II, Hotel Istana, Kuala Lumpur** and the opening hours are as follows:

- 25 July 2018: 8.30 am – 6.00 pm
- 26 July 2018: 8.30 am – 5.00 pm

TRADE EXHIBITION

Trade Exhibition is located at **Foyer, Ballroom Level, Hotel Istana, Kuala Lumpur**. Opening hours:

- 25 July 2018: 8.30 am – 6.00 pm
- 26 July 2018: 8.30 am – 5.00 pm

OFFICIAL LANGUAGE

The official language of the conference is **English**.

CERTIFICATE OF ATTENDANCE

E-Certificate of Attendance will be given to all registered delegates upon request within 7 working days after the Conference via email (soft-copy). Special certificates will be given to those who participated in the Young Researcher's Symposium, Nutrition Research Updates (Oral Presentations) and Poster Presentations. To request for E-certificates, kindly write your full name and email address at the Registration Counter.

NAME BADGES

Registered delegates are to wear their name badges at all times during the Conference for identification and security purposes. Admission to all Conference sessions and meals is based on name badges.

LUNCH & COFFEE BREAKS

Lunch shall be served at **Mahkota 1 & III Ballroom**. Refer to the lunch tag for the location of your lunch venue.

Morning and afternoon refreshments shall be served around the trade exhibition area at the **Foyer, Ballroom Level, Hotel Istana, Kua la Lumpur.**

FOR SPEAKERS: **Submission of slides and preview**

Speakers for Symposium 1 and 2 are requested to submit their presentation materials to the Speaker Preview Room during registration in the morning of Day 1. Speaker of Day 2 sessions are requested to submit their presentations before the end of Day 1.

Please inform the Conference Secretariat staff once you have submitted the presentation materials.

Speaker Preview Room is located at the **Secretariat Room – Zamrud Room, Ballroom Level, Hotel Istana, Kuala Lumpur** and the opening hours are as follows:

Wednesday, 25 July 2018 & Thursday, 26 July 2018: 8.00 am – 5.00 pm

Please be present at your session room at least ***15 minutes*** prior to the start of the session and identify yourself to the secretariat staff.

FOR CHAIRPERSONS

Please be present at your session room at least ***15 minutes*** prior to the start of your session.

CELLULAR PHONE

As a courtesy to all delegates and speakers, cellular phones and other electronic devices must be operated in silent/vibration mode throughout the Conference sessions. No telephone conversations are permitted in the session rooms.

WI-FI

WI-FI is available throughout the hotel. No password is required.

PARKING

Parking in the hotel is charged at RM11.00 flat rate. Please have your parking ticket validated at the foyer area (please look for Hotel staff for assistance).

BREASTFEEDING ROOM

The Baiduri Function Room (Ballroom Level) has been reserved as special area for Breastfeeding / Expressing area. (Please approach the Conference Secretariat to obtain the access key to the room and further assistance)

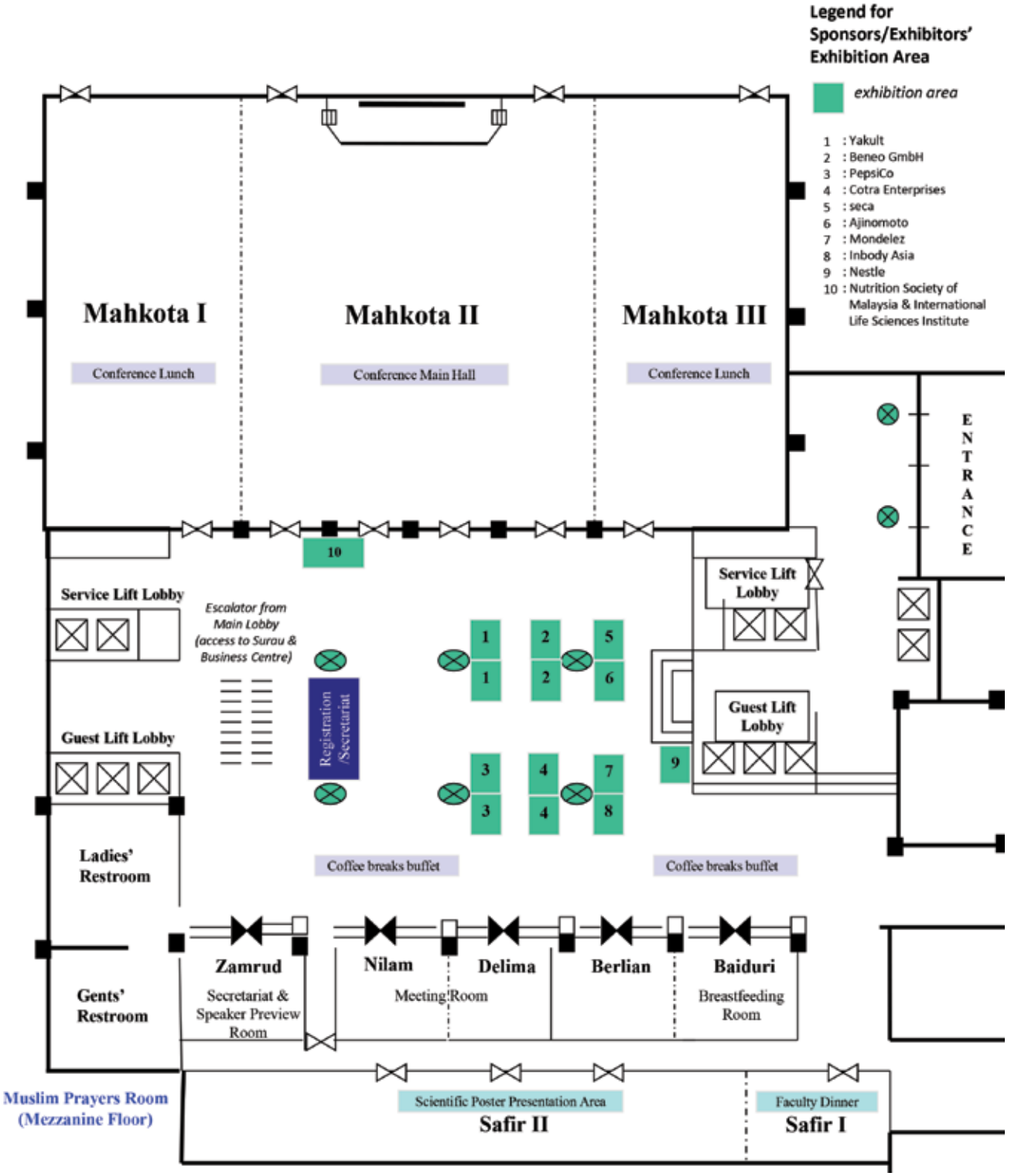
PRAYER ROOM

Surau is located at the **Mezzanine Floor of Hotel Istana Kuala Lumpur**.

LIABILITY

The Organising Committee will not assume any responsibility for accidents, losses or damages, as well as delays or modifications of the Conference programme.

Event Layout & Exhibitor Area Layout



NSM Prizes 2018

NSM Postgraduate and Undergraduate Prizes 2018

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: RM1,000 for a PhD thesis, RM750 for MSc thesis and RM500 for the undergraduate prize. In 2018, NSM is awarding eight Postgraduate Prizes: three for PhD and five for MSc, with a total cash award of RM6,750. Four undergraduates receive Undergraduate Prizes with a total cash of RM2,000. The total cash award for this year is RM8,750.

The recipients for the PhD thesis prizes are:

1. **Dr Nor Baizura Md Yusop**
   Development of nutrition practice guidelines (NPG) and its efficacy in combination with N3-LCPUFA supplement for management of childhood obesity

Supervisor:	*Prof Dr Zalilah Mohd Shariff*
Co-supervisors:	*Assoc Prof Dr Ting Tzer Hwu, Prof Dr Rozita Abd Talib and Prof Dr Nicola Spurrier*
University:	*Faculty of Medicine and Health Sciences, Universiti Putra Malaysia*

2. **Dr Satvinder Kaur Nachatar Singh**
   Metabolic syndrome risk factors and effectiveness of a nutrition and physical activity educational programme to improve adiposity among Punjabi women in Klang Valley

Supervisor:	*Assoc Prof Dr Hamid Jan Jan Mohamed*
Co-supervisors:	*Assoc Prof Dr Rohana Jalil*
University:	*School of Health Sciences, Universiti Sains Malaysia*

3. **Dr Wee Bee Suan**
   Body composition, energy expenditure, physical activity and association with metabolic syndrome in Malay children aged 9-14 years old

Supervisor:	*Prof Dr Poh Bee Koon*
Co-supervisors:	*Datuk Prof Dr Awang Bulgiba Awang Mahmud, Emeritus Prof Dr Mohd Ismail Mohd Noor, Dr Paul Deurenberg and Dr Ailing Liu*
University:	*Faculty of Health Sciences, Universiti Kebangsaan Malaysia*

The recipients for the MSc thesis prizes are:

1. **Chan Chee Shan**
   Metabolic responses to isomaltulose by Malaysian Chinese adults: a pilot study
   Supervisor: *Prof Dr Peter Michael Barling*
   Co-supervisors: *Dr Sangeetha Shyam and Assoc Prof Dr Verna Lee Kar Mun*
   University: *Division of Nutrition and Dietetics, International Medical University*

2. **Mohd Izham Mohamad**
   Effects of application of nutrition education tool on nutritional status and physiological characteristics among Malaysian national cyclists
   Supervisor: *Assoc Prof Dr Nik Shanita Safii*
   Co-supervisors: *Emeritus Prof Mohd Ismail Mohd Noor and Dr Yeo Wee Kian*
   University: *Faculty of Health Sciences, Universti Kebangsaan Malaysia*

3. **Nurzaime Zulaily**
   Determinants of obesity among adolescents in Terengganu: a population study
   Supervisor: *Dr Aryati Ahmad*
   Co-supervisor: *Dr Mohd Razif Shahril*
   University: *Faculty of Health Sciences, Universiti Sultan Zainal Abidin*

4. **Siti Soraya Mohd Elias**
   Effects of sports nutrition education on knowledge, attitude and practice of sports nutrition and nutritional status among elite male athletes in Malaysia
   Supervisor: *Assoc Prof Dr Hazizi Abu Saad*
   Co-supervisors: *Assoc Prof Dr Mohd Nasir Mohd Taib and Dr Zubaidah Jamil*
   University: *Faculty of Medicine and Health Sciences, Universiti Putra Malaysia*

5. **Tan Shu Wen**
   The knowledge and awareness of medical doctors on Malaysian Dietary Guidelines 2010 and early development stage of a new pictorial food guide
   Supervisor: *Prof Dr Wan Manan Wan Mud*
   Co-supervisor: *Dr Soo Kah Leng*
   University: *School of Health Sciences, Universiti Sains Malaysia*

The recipients for the undergraduate thesis prizes are:

1. **Muhammad Fawwaz Khairuddin**
   Total polyphenol and nutrient contents in dried fruits in Selangor
   Supervisor: *Assoc Prof Dr Hasnah Haron*
   University: *Faculty of Health Sciences, Universiti Kebangsaan Malaysia*

2. **Winnie Tiong**
   Determination of healthiness of pre-packaged foods based on traffic light colour-coded nutrition labelling in three major types of retail food outlets in Kelantan
   Supervisor: *Assoc Prof Dr Foo Leng Huat*
   University: *School of Health Sciences, Universiti Sains Malaysia*

3. **Wong Mun Kin**
   In vitro determination of antioxidant content in Malaysian stingless bee propolis using WIL2-NS cells
   Supervisor: *Dr Razinah Sharif*
   University: *Faculty of Health Sciences, Universiti Kebangsaan Malaysia*

4. **Eva Yu Koh Xing**
   Factors associated with anemia among third-trimester pregnant women at selected health clinics in Hulu Langat, Selangor
   Supervisor: *Dr Chin Yit Siew*
   University: *Faculty of Medicine and Health Sciences, Universiti Putra Malaysia*

NSM Publication Prizes 2018

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 2018. These are for different fields of nutrition research, namely: Maternal Nutrition; Dairy Nutrition and Mobility and Musculoskeletal Health and Nutrition.

NSM Publication Prize: Maternal Nutrition

For the Publication Prize in the field of Maternal Nutrition, for the year 2016 – 2018, this prize is sponsored by Fonterra Brands (M) Sdn Bhd. The intention was to provide 1 award each year, each to carry a cash prize of RM2,000 and a certificate by NSM.

For the year 2018, only one application was received for this category. The Selection Committee decided to award the prize to the applicant, with details as follows:

Name of recipient:	**Dr Yang Wai Yew** [O 1256] *Division of Nutrition and Dietetics, School of Health and Medicine, International Medical University*
Publication:	Parent-child feeding practices in a developing country: Findings from the Family Diet Study *Appetite* *doi: 10.1016/j.appet.2018.01.037.*

NSM Publication Prize: Dairy Nutrition

For the Publication Prize in the field of Dairy Nutrition, for the year 2016-2018, this prize is sponsored by Fonterra Brands (M) Sdn Bhd. There shall be 1 award each year, each to carry a cash prize of RM2,000 and a certificate by NSM.

For the year 2018, no application for this Prize was received.

NSM Publication Prize: Mobility and Musculoskeletal Health and Nutrition

For the Publication Prize in the field of Mobility and Musculoskeletal Health and Nutrition, for the year 2016-2018, this prize is sponsored by Fonterra Brands (M) Sdn Bhd. There shall be 1 award each year, each to carry a cash prize of RM2,000 and a certificate by NSM.

For the year 2018, only one application has been received for this category. The Selection Committee decided to award the prize to the applicant, with details as follows:

Name of recipient:	**Dr Mahenderan Appukutty** [L 718] *Faculty of Sports Science & Recreation,* *Universiti Teknologi MARA, Shah Alam.*
Publication:	Colostrum supplementation protects against exercise-induced oxidative stress in skeletal muscle in mice *BMC Research Notes* https://doi.org/10.1186/1756-0500-5-649

NSM Young Researchers' Symposium Prizes 2018

Winners of the Young Researchers' 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 for 2018, totalling RM1,100 are provided by International Life Sciences Institute Southeast Asia Region.

NSM Poster Competition Prizes 2018

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 for 2018, totalling RM750 are provided by International Life Sciences Institute Southeast Asia Region.

List of Scientific Posters

Scientific posters have been grouped into the following themes:

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

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

Poster Presentation

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

A01 The influence of body fat on the association of serum 25-hydroxy Vitamin D and muscle strength in postmenopausal Malaysian Malay women
Abidin Z N, Tay H X and Mitra S R

A02 Malnutrition among Orang Asli children in Hulu Perak and Gua Musang
Ajlaa AR, Sameeha MJ and Poh BK

A03 Bone mineral density, bone mineral content and body composition of 9 to 11-year-old prepubertal Malaysian children – early findings from the PREBONE_Kids study
Arasu K, Chang CY, Wong SY, Rabi'atuladawiyah B, Nur Aziemah AG, Ong SH, Yang WY, Megan C, Meenal M, Khoo EJ and Chee WSS

A04 Associations between sociodemographic, lifestyle, and psychological factors with abdominal obesity among adult vegetarians
Chai ZF, Gan WY, Chin YS, and Ching YK

A05 Lean mass is a significant determinant of bone mass in prepubertal children aged 9-11 years old – early findings from the PREBONE-Kids study
Chang CY, Arasu K, Wong SY, Rabi'atuladawiyah B, Nur Aziemah AG, Ong SH, Yang WY, Chong MZH, Meenal M, Khoo EJ and Chee WSS

A06 Change of health literacy and intervention outcomes among housewives in low cost flats: MyBFF@Home study
Cheong SM, Noor Safiza MN, Mohd Hasnan A, Rashidah A, Ruhaya S, Azli B, Nur Shahida AA, Syafinaz MS and Chan YY

A07 Associations of nutritional and socio-cultural factors with self-esteem among upper primary school children in Kuala Lumpur
Yong TY and Chin YS

A08 Body composition and somatotypes of male sprinters and hurdlers in Malaysia
Erliza Nur MK and Noor Kamsina A

A09 The prevalence of BMI status and household food insecurity among primary school children in Kuantan, Pahang
Halimatun Saadiah AG, Suriati S, Wan Azdie MAB, Noor Atirah Y, Roselawati MY and Rozlin AR

A10 The association between physical activity and nutritional status among female undergraduate students of Universiti Sains Malaysia Health Campus
Izni Nadirah S and Hamid Jan JM

A11 Association between socio-demographic background, dietary intake and body fat percentage among selected older adults in Selangor
Jazeera J, Appannah G , Salmiah MS, Subashini T, Intan Nureslyna S, Siti Yazmin ZS , Sthaneshwar P, Lee HF and Sim YS

A12 Relationship between nutrition knowledge and physical fitness among overweight and obese secondary school children
Kamarudin MA, Genisan V, Singh L, Jalaludin MY, Ishak Z, Selamat R, Yahya A and Mokhtar AH

A13 Changes of weight and body composition parameters at 1 year follow-up after participating 6 months of worksite weight loss program among civil servants in Kota Bharu, Kelantan
Kui XQ, Rohana AJ and Liu KT

A14 Parental perceptions on the motivators and barriers of preschoolers' screen time
Lee ST, Wong JE and Poh BK

A15 Factors contributing to bone resorption among postmenopausal Chinese women in Kuala Lumpur and Selangor
Leiu KH, Chin YS, Chan YM, Zalilah MS, Chan KS and Lim SY

A16 Attitude and limiting factor of breastfeeding among working mother in Universiti Kebangsaan Malaysia (UKM), Bangi campus
Maisara WA and Razalee S

A17 Correlation between waist-hip circumference ratio and body mass index with blood glucose level
Mitha K

A18 Socio-demographic factors associated with duration of exclusive breastfeeding among mothers of infants aged under 6-24 months in Petaling district, Selangor
Nur Liyana NA, Ainor Farahin A and Mohamad Fauzan CB

A19 *Ceria, Respek, Gigih, Aktif, Sihat* (C.E.R.G.A.S.): Assessing the sustained impact of a school-based obesity intervention programme
Mok WKH, Lau XC, Wee LH, Ruzita AT and Poh BK

A20 Associations between socio-demographic characteristics, medical history, obstetrical history and newborn birth weight among mothers in Kuala Lumpur and Selangor
Muliana E, Woon FC, Siti Huzaifah MH, Tan ML, Farhan HS, Geeta A, Gan WY, Chan YM, Intan Hakimah I, Amir Hamzah AL and Chin YS

A21 Household food insecurity and nutritional status among adolescents in Kuantan, Pahang.
Noor Atirah Y, Wan Azdie MAB, Suriati S, Halimatun Saadiah AG, Roselawati MY and Rozlin AR

A22 Factors associated with gestational weight gain among pregnant women in Sepang, Selangor
Noornabihah NY and Nurzalinda Z

A23 Nutrition labelling: An exploratory study on personal factors that influence knowledge and perception on nutrition labels among adolescents
Norsakira Jefrydin, Norazmir Md Nor and Ruzita AT

A24 Factors affecting induced lactation practice: applying a conceptual framework
Norsyamlina CAR, Zaharah S and Tengku Alina TI

A25 Association between socio-demographics, social media exposure, sleeping pattern and physical activity level with body weight status among students in faculty of medicine and health sciences, Universiti Putra Malaysia
Nur Fadhilah Auzairuddin and Zulfitri 'Azuan Mat Daud

A26 Determination of dietary practices associated with hydration status of state junior male athletes in Kelantan
Nur Syahira M and Leng FH

A27 Factors correlated with body weight status using Asian cut-off points among undergraduate university students in Universiti Putra Malaysia
Nurfarah Aida S and Barakatun Nisak MY

A28 Association between socio-demographic factors and diet quality with bone mineral density among adults aged 50 to 90 years old in Klang Valley
Nurhannysa MY, Appannah G, Salmiah MS, Subashini T, Intan Nureslyna S, Siti Yazmin ZS , Sthaneshwar P, Lee HF and Sim YS

A29 Socioeconomic and demographic factors associated with complementary feeding practices and body weight status of children in Petaling District, Selangor
Nik Aimie Ayunie A and Sarina S

A30 Creating a healthier nutrition environment in secondary schools (NuTeen): rationale, design and baseline findings
Shashikala S, Mirnalini K and Vaidehi U

A31 Associations of socio-demographic, maternal and neonatal factors with neonatal weight gain at 3-month old at selected health clinics in Rompin, Pahang
Siti Nurfittrah AH and Chin YS

A32 Nutrition education for Rohingya students in Kuala Lumpur: a pilot study
Suhundani TS, Yeo J and Yim HS

A33 Relationship between physical activity and early childhood development among children aged 1 to 3 years in Klang Valley
Tan CY, Koh D and Poh BK

A34 Physical activity level and its related factors among primary school children in Kuala Lumpur
Oon WQ, Tang KC, Noor Afifah AR and Poh BK

A35 Food security status affects stress level and academic performance among university students
Syakirah A and Wan Azdie MAB

A36 Nutritional attitude: association with emotional and behavioral problems among overweight and obese secondary school students of MyBFF@school program
Wan Ibrahim WAH, Ishak Z, Low SF, Mansor F, Yahya A, Selamat R, Jalaludin MY and Mokhtar AH

A37 Internet addiction and physical activity among health campus students, Universiti Sains Malaysia
Wan JKand Soo KL

A38 Stress and metabolic syndrome among adults in Terengganu
Miow YX, Wee BS, Karimah Fakhriah I and Aryati A

A39 Physical activity and its related factors amongst adolescents in Kuala Lumpur
Nurul Adryna S, Yeo GS, Siti Hanisa A and Poh BK

A40 Application of trans- theoretical model on fatty foods, fruits and vegetable consumption among overweight, obese and morbidly obese secondary school children
Selamat R, Zulkiply AA, Raib J, Zulkafly N, Abdul Aziz NA, W Mohammad WNA, Ismail AN, Jalaludin MY, Ishak Z and Mokhtar AH

Group B: Dietary Intake, Consumption Pattern & Disease

B01 Factors correlated with food addiction symptoms among undergraduate students in Universiti Putra Malaysia
Cheah JMH and Chin YS

B02 Association of snacking behaviour with depression and cardiovascular diseases risk factors among University students
Cherng CXR and Mohamad M

B03 Association between dietary intake and metabolic syndrome in Malaysian vegetarians
Ching YK, Chin YS, Gan WY and Mahenderan A

B04 Association between snacking frequency, dietary intake and body mass index among undergraduate students at Universiti Sains Malaysia Health Campus
Gan HMand Hamid Jan JM

B05 Association between dietary intake, physical activity and macronutrient composition of breast milk among lactating women in Klang Valley
Ho WH, Tan SS, Safiah MY, Tan SY, Raanita K, Maneesha GK and Jessvinder SJ

B06 Infant and young child feeding practices among low household income families in Kuala Lumpur and Kuala Selangor
Khairul Hasnan A, Norimah AK and Roslee R

B07 Night Eating Syndrome (NES) among adults in Klang Valley
Law AYL and Norimah AK

B08 Association between socio-demographic factors and frequency of home-cooked meals among primary school children in Klang Valley
Lim SY, Rosmawati D, Noor Hafizah Y, Wong JE, Hasnah H and Poh BK

B09 Association between dietary intake with antioxidant and nitric oxide level in breast milk among lactating women
Maneesha GK, Tan SS, Safiah MY, Tan SY, Raanita K, Ho WH and Jessvinder SJ

B10 Validation of Food Frequency Questionnaire (FFQ) for dietary assessment among Malaysian preschool children aged 4 to 6 years
Yap F, Najwa WN, Noor Hafizah Y, Farra Aidah J, Lee ST and Poh BK

B11 The influence of social networking sites on disordered eating behaviours among undergraduates in Universiti Sains Malaysia Health Campus
Ng JMand Reena KV

B12 Factors associated with fast food consumption among adolescents in Gombak, Selangor
Nor Alia AS and Gan WY

B13 Association between body composition and caffeine intake in relation to blood pressure level in undergraduate university students of Universiti Putra Malaysia
NorFaten Emalin R and Salma Faeza AF

B14 Knowledge, attitude, risk perception towards the usage of repeatedly heated cooking oil among food providers at UiTM Puncak Alam and Puncak Perdana campus
Nur Aida Nabilah E, Qistina MS, Lovelyna BJ, Saidatul Afzan AA, Norhidayah A and Zuraini MI

B15 The influence of personal factors towards fruits and vegetables intake: a preliminary study among undergraduate students at UiTM Puncak Alam, Selangor
Nur Aini AK, Nadia I and Zuraini MI

B16 Associations of socio-demographic background, food group intakes and eating behaviours with sleep quality among primary school children in Batu Pahat district, Johor
Nur Amalin J, Chin YS, Barakatun Nisak MY and Appannah G

B17 Association between body composition and polyphenol intake in relation to blood pressure level in students of Universiti Putra Malaysia
Nurul Arinah F and Salma Faeza AF

B18 The prevention of silent killer disease: planning dietary intake for hypertension sufferers
Renticabella PE

B19 Food label: Do adolescents in Malaysia read it?
Ruhaya S, Ruzita AT, Lai WK, Noor ul-Aziha M, Mohamad Hasnan A, Cheong SM, Azli B, Lalitha P, Rashidah A, Nor Azian MZ, Nur Shahida AA, Fatimah O, Hazizi AS and Shubash S

B20 Home food availability, dietary intake and socioeconomic status of primary school children in Kubang Kerian, Kelantan
See Mand Hamid Jan JM

B21 Meal experiences of in-patients at hospital Universiti Sains Malaysia (HUSM)
Shahrowi SA and Vijayakumaran RK

B22 Consumption of sugar-sweetened beverages and its associated factors among adolescents in Gombak, Selangor
Siti Fathiah M and Gan WY

B23 Hydration status and performance of National Elite lawn bowl players during Ramadan
Tania Lee XY and Sofwan Naim

B24 Stress and snacking behaviours among university students and its association with the risk of type 2 diabetes
Thong WK and Mohamad M

B25 Knowledge, perception, and consumption patterns of Prophetic food and remedies among Mauritians of Islamic faith
Bukhory BMB, Toorabally BZ, Aumeeruddy MZ, Hosenally M and Mahomoodally FM

B26 Food insecurity, food expenditure and diet quality among university students in Klang Valley
Voon SC and Wong JE

B27 Comparison between food diary mobile application with paper-based food diary and 24-hour dietary recall among adults: The method of triads
Ainaa Fatehah A, Poh BK and Wong JE

B28 Pilot study: nutritional status, dietary intake and habits in relation to body composition among foreign construction workers
Wong ME and Chong PN

Group C: Nutrients & Other Components in Foods/Products

C01 Proximate composition, total phenolic content and total flavonoid content of wheat bread and quinoa-wheat composite bread
Anis Izzaty N and *Siti Raihanah S*

C02 Determination of total starch, amylose, amylopectin and resistant starch in banana at different ripening stages
Lim KX, Soo ZX, Yeo WQ, Chang SK and Snigdha M

C03 Effect of cooking methods on resistant starch, amylose, amylopectin and total starch content of white rice
Lim SS, Tan YC, Snigdha M and Chang SK

C04 Nutritional composition, sugar profiles and sensory acceptability of ambarella (*spondias dulcis)* jam using different types of sugar
Muhammad Alif Aiqal R and Norfarizan Hanoon NA

C05 Determination of total phenolic content, total flavonoid content and antioxidant activity in the mixture of stingless bee honey (*madu kelulut*) with garlic, cinnamon, lemon and ginger
Nor Ainun A and Norhaizan Mohd Esa

C06 Dietary estimation of aflatoxin M1 exposure in urine as compared to aflatoxin databases among residents in Hulu Langat, Selangor
Nur Ellya Fanina MF and Rosita J

C07 Inhibitory effect of brewers' rice (*temukut*) on α-amylase and α-glucosidase activity
Nur Farah Wahidah R, Norhaizan Mohd Esa and Mohamad Zulhafiz Shafiq Zulhilmi Cheng

C08 Antioxidant properties of fresh and frozen peel of lemon, key lime and musk lime as a potent source of antioxidant
Nur Fatin Inazlina NA and Azrina A

C09 Proximate composition and total phenolic content (TPC) in spelt (*Triticum Spelta*) bread and spelt flour
Nurain Nabila AH and Siti Raihanah S

C10 Total antioxidants activity, total phenolic content and total flavonoid content of *Polianthes tuberosa* (*sedap malam*) and *Ruellia tuberosa* (*gempur batu*) leaves
Nurfazira R and Loh SP

C11 Proximate compositions and total sugar content of sugarcane (*Saccharum Officinarum L.*) peel and bagasse
Siti Zulaikha M and Mohd Redzwan S

C12 Determination of amylose, amylopectin, resistant starch and total starch in papaya at different ripening stages
Soo ZX, Lim KX, Yeo WQ, Chang SK and Snigdha M

C13 Effect of cooking methods (conventional rice cooker and draining method) on amylose, amylopectin, resistant starch and total starch content of selected brown rice
Tan YC, Lim SS, Yeo WQ, Lim KX, Soo ZX, Snigdha M and Chang SK

C14 Effect of extraction solvent on antioxidant capacity, total phenolic and flavonoid contents of *Cleome gynandra*
Teh LF and Amin I

C15 *In vitro* determination of antioxidant content in Malaysian stingless bee propolis using WIL2-NS cells
Wong MK and Razinah Sharif MS

C16 Determination of amylose, amylopectin, resistant starch and total starch contents in guava at different ripening stages
Yeo WQ, Soo ZX, Lim KX, Tan YC, Lim SS, Chang SK and Snigdha M

Group D: Clinical Nutrition/Intervention Trials

D01 The effects of prebiotic fiber on bone health among prepubertal kids (PREBONE-Kids) – a study protocol
Arasu K, Chang CY, Wong SY, Rabi'atuladawiyah B, Nur Aziemah AG, Ong SH, Yang WY, Megan C, Meenal M, Khoo EJ and Chee WSS

D02 Association between fruits and vegetables intake and body mass index (BMI) among cardiovascular disease patients in Hospital Universiti Sains Malaysia (HUSM)
Anne Pui WN and Hamid Jan JM

D03 Associations of dietary eating practices on glycemic control and quality of life of diabetic patients in Hospital Universiti Sains Malaysia (HUSM), Kelantan
Athirah AB and Hamid Jan JM

D04 Consumer acceptance study on weight management soy protein drink among overweight and obese adults
Heng YY and Chong PN

D05 "Healthy Without Frailty" program to prevent frailty and adverse outcomes: a protocol of an intervention study involving urban poor pre-frail elderly
Muhammad Faizal M, Siti Nur 'Asyura A, Hazizi AS, Chan YM, Zuriati I and Noraida O

D06 Positive impact of educational booklets on cancer prevention towards knowledge on diet and physical activity among early adults
Shahril MR and Cheng SH

D07 The effect of using different spoon sizes on postprandial glycaemia, hunger and satiety ratings in overweight and obese subjects consuming white rice
Tan YW, Teo CY, Shyam S and Abdul Ghani R

D08 The effect of using different spoon sizes on postprandial glycaemia, hunger and satiety of overweight and obese subjects consuming brown rice
Teo CY, Tan YW, Shyam S and Abdul Ghani R

D09 Impacts of nutrition education interventions on metabolic syndrome among adults: A systematic review
Toorabally BZ, Rohana AJ and Subratty AH and Hamid Jan JM

D10 The emotional experience of eating during hospitalisation in Malaysian public hospitals
Vijayakumaran RK, Shariza AR and Nur Farhana A

Group E: Food Science & Technology

E01 Prebiotic potential of sugarcane (*Saccharum Officinarum L.*) agro-industrial by-products on the growth of probiotic
Azizan IAM and Mohd Redzwan S

E02 The ability of leuconostoc fallax to ferment gum arabic (Acacia Senegal & Acacia Seyal) and inulin
Hammad Ahallil, Aminah Abdullah, Mohamad Yusof Maskat and Shahrul R Sarbini

E03 Effects of drying method on the phenolic content and antioxidant activity of figs fruit
Idries Muhson Abeed Al-Mashkoor and Zuhair Radhi Addai

E04 Determination of antioxidant activity and total phenolic content of sugarcane (*Saccharum officinarum* L.) bagasse and peel using aqueous and ethanol extractions
Muhammad Firdhaus S and Mohd Redzwan S

E05 Nutritional composition and textural properties of ready-to-eat compact rice developed from selected brown rice available in Malaysia
Noor Syafinaz H and Wan Rosli WI

E06 Total antioxidant contents and activities of non-irradiated and irradiated *Archidendron jiringa (Jering)* and *Archidendron bubalinum (Kerdas)*
Noor Syafiqa Aqila MR and Nurul Husna S

E07 Acceptance of low-sodium soup among primary school children in Klang Valley
Rosmawati D, Lim SY, Hasnah H, Wong JE, Noor Hafizah Y and Poh BK

E08 Comparison of physicochemical properties of three types of milk obtained from goat, cow and coconut (*santan*) in Malaysia
Saif Alyaqoubi and Aminah Abdullah

E09 Development of alginate beads with grass jelly, Luo Han Guo and palm sugar as source of antioxidants
Tan PYH and Handayani AP

E10 Bioconversion of isoflavones and growth characteristics of orally isolated putative probiotics in soymilk for orally-dissolving strip development
Yap KY and Ewe JA

E11 Effect of gum arabic on antioxidant compounds of papaya fruit during cold storage
Zuhair Radhi Addai, Aminah Abdullah, Sahilah Abd Mutalib and Khalid Hamid Musa

E12 Influence of gum arabic on antioxidants activity and flavonoids (myricetin, quercitin and koempferol) of papaya fruit
Zuhair Radhi Addai, Aminah Abdullah and Sahilah Abd Mutalib

Group F: Experimental Nutrition

F01 The effect *Archidendron Jiringa* and *Sambiloto* intake in diabetes mellitus rats
Annisa, Panji Maulana, Ranthi Ranthi, Qorin Levri and Ice Yolanda Puri

F02 Effects of diets with different composition of macronutrients on the production aflatoxin B_1 (AFB_1) biomarkers in AFB_1-induced rats
Nurul Adilah Z, Liew WPP, Mohd Redzwan S and Amin I

F03 *In vitro and in vivo* studies on the ability of *Lactobacillus casei* Shirota as a potential aflatoxin B_1 adsorbent
Liew WPP, Nurul Adilah Z, Mohd Redzwan S and Than LTL

F04 Cytotoxicity potential of local plant extracts against HK1 nasopharyngeal carcinoma cell line
Musa ND, Hwang SS and Ginjom IR

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1. WHO Growth Standard (2007).
* Iyyanki DTT et al. J Hum Nutr Diet. 2015;28:623-35. Complete nutrition with high protein, calcium, vitamin C, iron & source of zinc. As part of daily diet. Individual results may vary.
** No 1 in Total Peninsular Malaysia in Specialty Segment within Children Milk Category. Based on Retail Index Surplus for the Children Milk Category for 12 months ending December 2016 for Total Peninsular Malaysia (Copyright©2017, The Nielsen Company)

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Abstracts

Pre-Conference Symposium

Nutrition labelling requirements in Malaysia

Fatimah Sulong

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Food labelling, including simplified nutrition labelling, has been identified as an important tool to assist consumers in adopting healthy dietary practices by making wise food choices, to reduce the increasing incidence of obesity and chronic non-communicable diseases (NCDs) that is being faced worldwide. Malaysia has made nutritional labelling mandatory for most of the prepacked foods since 2003. Such information serves to remind the consumers to think of nutritional quality of a food besides to other information such as expiry date, storage conditions and ingredients. In addition to the currently mandated back or side nutrition information panel (NIP), summary nutrition information have also been added on the front-of-pack (FOP). The FOP for energy icon was launched by the Health Minister on 2nd April, 2012. The icon provides description of the number of calories contained to help consumers estimate their daily nutrient intake in certain food products. Another FOP scheme, Healthier Choices Logo (HCL), was launched on 20th April 2017. These icons are to be promoted in conjunction with the nutrition label as one of the tools to assist consumers in making food choices, as well as to encourage food industries to produce healthier food options to be available in the market.

This presentation highlights some updates on nutrition labelling regulations in the country, including the voluntary FOP schemes that have been implemented in Malaysia. Any nutrition labelling systems including FOP need to be accompanied by awareness and education programmes of multi-stakeholders. It is important that all stakeholders should play a more prominent role in ensuring that consumers utilise nutrition information on the label.

Nutrition labelling and claims: Regulatory updates in Malaysia

Norrani Eksan

Food Safety and Quality Division, Ministry of Health Malaysia

This presentation provides an overview on the current regulatory status on nutrition labelling and claims in the Malaysia Food Regulations 1985 and its amendments.

These nutrition labelling and claims regulations were developed based on Codex, taking into consideration comments from industries and consumers. Basically the regulations cover two main areas. Firstly, the regulations require food industries to label their packaged food products by declaring the energy values, carbohydrates, protein and fat contents for certain common food groups consumed by Malaysian. Secondly, the regulations lay down provisions pertaining to various nutrient claims. Specific provisions have been made for nutrient content claim, comparative claim and nutrient function claims. Nutrient content and comparative claims are permitted to be made, provided specific conditions are met

Malaysia adopts a positive list approach to function claims. Hence, only nutrient function claims that are listed will be allowed to be used by the industries. Currently, a total of fifty-two (52) permitted nutrient function claims may be used by industries subject to particular conditions attached to each. Out of these total nutrient function claims, 29 are other

function claims. These claims describe specific beneficial effect of "other food components" that are able to give positive contribution to health or improvement of a function of the body. Disease risk reduction claims are not permitted in Malaysia.

The industry may apply for new function claims to be added to the positive list. This presentation also summarises the steps to be taken, using a prescribed format. There are specific information to be included in each application, including basic information such as chemical structure, stability, bioavailability, analytical method and safety data. A main requirement is scientific data to substantiate the proposed claim.

The latest list of permitted other function claims under the Malaysian Food Regulations 1985 are summarised. The presentation also highlights the latest amendments that permit other claim such as claim on probiotic cultures in improving intestinal or gut function for 32 new strains as listed in the 12th A Schedule. The presentation also highlights the amendment on Nutrition labelling and claims that are proposed to be gazzeted.

Status of nutrition labeling and claims in Southeast Asia: An overview

***Jocelyn Wong* and Pauline Chan**

ILSI SEA Region, Singapore

The International Life Sciences Institute (ILSI) Southeast Asia Region has organized a series of seminars and workshops on nutrition labeling, claims and communication strategies since 2001 in SEA region. These meetings gave updates on relevant international, regional and national regulations and provided a platform to discuss various issues and challenges, such as scientific substantiation, communication and education using labels and claims, as well as harmonization opportunities within Southeast Asia countries. This presentation will thus give an overview to the status of nutrition labeling, nutrition and health claims regulations in Southeast Asia countries as well as ILSI SEA Region's activities and effort in nutrition labeling and claims within the region.

KEYNOTE ADDRESS

National strategies and programmes to promote nutritional wellbeing of Malaysians – challenges and way forward

Azman AB

Public Health Programme, Ministry of Health, Malaysia

Malaysia still faces double-burden of malnutrition. While there are rising rates of obesity and other diet-related non-communicable diseases (NCDs), stunting, anemia and iodine deficiency still remain as nutritional concerns in the country. Therefore, more holistic and comprehensive national strategies and programmes have been and will be undertaken to achieve optimal nutritional well-being of Malaysians. Thus, to translate the National Nutrition Policy of Malaysian into actions, series of the National Plan of Action for Nutrition Malaysia (NPANM) have been formulated and implemented since 1996. The NPANM, under the purview of the National Coordinating Committee on Food and Nutrition (NCCFN), provides the guiding principles and framework for all nutrition and nutrition-related activities in the country. Some of the challenges in the implementation of earlier NPANM I and NPANM II were inadequate resources, lack of commitment from other stakeholders, lack of capacity for monitoring and evaluation of nutrition indicators and activities, apart from no inclusion of specific enabling strategies to address maternal nutrition and sustainable food system for healthy diet. Therefore, all these challenges and gaps were taken into consideration in the formulation of the NPANM III, 2016-2025. A number of key nutrition indicators and strategies in line with the nutrition commitments at international, regional and national level have been incorporated into this Plan. More extensive nutrition sensitive- and specific activities will be conducted through trans- and multi-sectoral approach at all levels. Some of the major way forward of the NPANM III are giving more serious attention to the maternal and young children nutrition as well as ensuring food and nutrition security of the population. More outreach activities will be carried out especially targeting to vulnerable groups such as young children, adolescents and women of reproductive age group. Healthy eating promotion will be strengthened across sectors, life course and settings. Ensuring policy coherent and commitments by all sectors would be a priority for effective implementation of NPANM. In conclusion, apart from all these outlined strategies and programmes, Malaysians themselves should also be more responsible for their own health.

Symposium 1: Why Invest in Nutrition?

Dietary pattern, gestational weight gain and risk of gestational diabetes mellitus

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The past decades of rapid economic growth and development in Malaysia have brought about significant changes in dietary, physical activity and disease patterns. Diets high in fats, sugars and animal-source foods and sedentary lifestyle have contributed to the increasing prevalence of obesity and non-communicable diseases among its adult population. The link between early life experience and risk of nutrition-related non-communicable diseases in adult life is supported by epidemiological studies. Individuals may be more susceptible to such diseases during adult years due to poor experience in early life, such as inadequate or excess nutrition during pregnancy. The Malaysian Adult Nutrition Survey (2014) showed that overweight and obesity (40.3 - 60.8%) are more prevalent than chronic energy deficiency (8.13%) among non-pregnant and non-lactating women (18-49 years). The same survey reported that while the achieved recommended energy intakes across age groups of women ranged from 58 – 72%, intakes of nutrients (except protein and vitamin A) were below two-thirds of the RNI. The Maternal and Child Health Survey (2016) of more than 10,000 women (15-49 years) with last childbirths less than 2 years showed that the prevalence of maternal obesity, hyperglycemia, hypertensive diseases and anemia were 14.6%, 13.5%, 5.8% and 29.3%, Based on national and small-scale surveys, only about one-third (32.5 – 35.2%) of pregnant women achieved adequate gestational weight gain. Gestational diabetes mellitus (GDM) is a common pregnancy complication that affects up to 18% of pregnant women, depending on populations and diagnostic criteria. In Malaysia, the prevalence of GDM based on hospital data (National Obstetric Registry, 2013) was 8.7%. However, smaller scale studies reported GDM to be in the range of 11-25%. This presentation aims to provide information on dietary intakes, gestational weight gain and gestational diabetes of pregnant women in Malaysia, drawing upon findings of national surveys, smaller-scale studies as well as an on-going prospective study of pregnant women (SECOST). The presentation will also highlight the limitations of and gaps in available data that should be addressed in future studies and that are crucial for intervention or programmatic strategies. As maternal health and nutrition is important not only for fetal but also later child growth and development, comprehensive strategies that promote nutritional well-being of reproductive age women should be incorporated into policies and programs of various ministries, institutions and other stake-holders.

Nutritional status of primary school children in Malaysia

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The aim of this presentation is to provide a snap shot of current nutritional status of primary school children aged 6-12 years old in Malaysia. Data on four main areas are presented, namely body weight/height status, dietary intake, biochemical parameters and physical activity status. Four recent nation-wide studies were referred: 1) The Southeast Asian Nutrition Surveys (SEANUTS) Malaysia (2013), which included 1,969 children aged 7-12 years; 2) The Malaysian School-Based Nutrition Survey (MSNS) 2012, which comprised of 2235 children aged 10-12 years; 3) MyBreakfast study (2015), which included

5567 children aged 6-12 years old and 4) National Health and Morbidity Survey (NHMS 2017) on adolescents, which comprised of 12,599 children aged 10-12 years. All four studies determined the body weight/height status and physical activity level. Three studies (SEANUTS 2013, MSNS 2012, and NHMS 2017) reported the dietary intakes of the children and only one study (SEANUTS) included biochemical assessment.

The overall prevalence for stunting and thinness from these four reports were of much lower proportions, ranging from 7.6-9.6% and 6.7-7.9% respectively. All four studies showed a high prevalence for combined overweight and obesity, which ranged 28.3-33.9%. In terms of dietary intakes, more than one third of the children in the SEANUTS study did not meet the Malaysian recommended nutrient intakes (RNI) for energy, calcium and vitamin D. In MSNS 2012, the children did not achieve the recommended servings for two food groups, namely vegetables (1.0 vs 3.0 servings/day) and milk and milk products (0.6 vs 1-3.0 servings/day). However, findings from the recent NHMS 2017 showed poor dietary intakes as more than 50.0% of children did not meet the recommended servings for majority of the food groups, namely fruits, vegetables, fish, and milk and milk products. Blood biochemical assessment which was only determined in the SEANUTS study reported a high vitamin D insufficiency (52.6%). However, less than 5.0% of the children had anaemia (4.2%), iron deficiency (4.7%), and vitamin A deficiency (3.5%). In terms of physical activity level, all four studies showed that majority of the children were in the moderate level. In SEANUTS (n=1702) and MyBreakfast study, the prevalence of children in the low physical activity level ranged from 24.5-28.3%, while a wider range was obtained for the high level, 9.3-25.8%. However, both MSNS 2012 and NHMS 2017 reported similar results on the prevalence for 'not active' category, which were 44.4% and 43.0%, while for 'active' category were 55.6% and 57.0% respectively.

In conclusion, primary school children in the country are faced with significant double burden of malnutrition in which overnutrition is much more prevalent. Dietary and physical activity patterns of these children are unsatisfactory. There is an urgent need to implement comprehensive intervention measures throughout the country to improve the nutritional status of these children. Investing in the nutritional well-being of children today is the only way to ensure healthier future generations of adult Malaysians.

Non-communicable disease (NCD) risk factors among adults in Malaysia

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Non-Communicable Diseases (NCDs) is the leading cause of death in the world including Malaysia. More than 70% of total deaths in Malaysia are contributed by NCDs with the biggest contributor being cardiovascular diseases. Following a declare on a fight against NCDs at the United Nations General Assembly in 2011, the World Health Organization (WHO) has developed a global monitoring framework to enable global tracking of progress in preventing and controlling major NCDs as well as their risk factors. In Malaysia, the trend of NCD risk factors are being monitored regularly by the Ministry of Health Malaysia through the National Health and Morbidity Survey (NHMS), which is a nationally representative health survey. Data from the previous NHMS showed an increasing trend of NCDs and their risk factors. The prevalence of diabetes among adults increased from 11.6% in 2006 to 17.5% in 2015. The prevalence of hypercholesterolemia among adults increased from 20.6% in 2006 to 47.7% in 2015. The prevalence of overweight and obesity increased significantly from 21.1% in 1996 to 47.7% in 2015. The prevalence of hypertension remain somewhat constant for the past 10 years where about one third of adults in Malaysia are having hypertension. Alarmingly, more than half of people with diabetes and hypertension and about 80% of those with hypercholesterolemia were unaware of their problems. The high

prevalence of major NCD risk factors will contribute heavily to the burden of NCDs. Thus, more aggressive approach, combining both soft and hard policies is needed to strengthen the NCD prevention and control in Malaysia.

Nutritional status of the elderly in Malaysia: past, current and future

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Malaysia is at the transition to become an ageing country with 14 % of elderly population in the year 2035. Nutrition plays an essential role to ensure independency, well-being and can contribute towards successful ageing. Malnutrition is one of the common problem among the elderly and often related to psychosocial problems, poor physical function, higher falls risk and depression. Studies on nutritional status of the elderly in Malaysia normally have separated the target population; either community dwelling or institutionalized elderly. Earlier study among elderly residing in publicly funded shelter homes has indicated that the elderly were underweight and at risk of under nutrition. In addition, another study in the same setting has reported that both malnutrition and overweight were prevalence among the residents. Results from NHMS III found that the prevalence of overweight and obese were higher in women (30.8 % and 13.8 % respectively) compared to elderly men (29.2 % and 7.4% respectively). The latest finding from NHMS (2015) reported a higher prevalence of overweight and obesity among elderly aged 60 years and above. The prevalence of underweight was higher among elderly above 75 years old. Same trend was reported from Towards Useful Aging (TUA) longitudinal study, with nearly 50 % of the elderly was overweight and obese. Overall, overweight and obesity among elderly is prevalent and require a great attention as it also coexist with chronic diseases that occur at midlife. A collaborative effort among multidisciplinary bodies specifically in the planning and implementation of sustainable intervention program to improve the health and well-being of the elderly is strongly required.

Symposium 2: Investing in Nutrition

Ensuring infant and young child nutrition in Malaysia

Rusidah S

Nutrition Division, Ministry of Health Malaysia, Putrajaya

An adequate and appropriate infant and young child nutrition is crucial for child health and development. This is reflected by the five of the six global nutrition targets are on infants and young children. Ensuring infant and young child nutrition has been an important national agenda as outlined in the National Plan of Action for Nutrition for Malaysia (NPANM) which has been implemented since 1996. The NPANM is implemented via multi and trans-sectoral approach with mobilization of the whole government and whole society. The incorporation of maternal, infant and young child nutrition as one of the six enabling strategies of the NPANM III 2016-2025 has indicated a greater focus of implementation. The strategies to address infant and young child nutrition start even before gestation with greater emphasis is given during a critical window period of the first 1000 days of life. One of the major programmes to ensure infant and young child nutrition by the

Ministry of Health is breastfeeding promotion. This includes the implementation of baby-friendly initiatives in government and private hospitals, health clinics, public areas and work places. In ensuring appropriate marketing and proper use designated products and complementary foods, compliance of the industries and health staffs to the Code of Ethics for the Marketing of Infant Foods and Related Products is closely monitored. Apart from strengthening the growth monitoring of the children attending the health facilities, specific national nutrition interventions to address undernutrition such as the implementation of the Rehabilitation Programme for Malnourished Children and the Community Feeding Programme are also undertaken. The involvement of other agencies, sectors and societies is strongly warranted and well recognised. To protect, promote and support women's rights to breastfeed their children, various incentives have been introduced by the government which include the provision of incentives in the form of financial grants up to RM200,000 to encourage the setting up of crèche at workplace and yearly 10% tax exemption over a period of 10 years on the overall cost of constructing crèche for private sectors conducted. In conclusion, ensuring optimum infant and young child nutrition in the country requires a strong commitment and concerted efforts from all the relevant sectors.

An urgent need to invest in promoting healthy nutrition and lifestyle among school children

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Promotion of healthy nutrition among school children has been found to be an important strategy in the reduction of risks to nutrition-related diseases later in adulthood. Recognising this, such interventions have been successfully implemented in several countries. This presentation summarises some of the initiatives in Malaysia, particularly those carried out by the Nutrition Society of Malaysia (NSM) as well as Nutrition Division, MOH and the universities to promote healthy nutrition and lifestyle in schools. Healthy Kids Programme (HKP), a two phase programme was conducted by NSM in collaboration with Nestle. In Phase 1 (2011-2013), a 3-year longitudinal intervention study was conducted to develop and evaluate the effectiveness of a nutrition education package in improving nutrition knowledge, attitude and practice (KAP) among 2,600 students in five primary schools in Klang Valley. The HKP was then extended into Phase II, to benefit more students in the country. From 2014-2016 the rollout involved the collaboration of Ministry of Education (MOE) and reached out to 77 selected primary boarding schools in Sarawak and Sabah, covering 9200 school children. In 2017, HKP was further rolled out to 28 primary schools in 8 states in Peninsular Malaysia, and engaged 7,023 students. Roll out continues in 2018 to more schools in others parts of the country. All the modules are available at HKP website (www.healthykids.org.my).

The Southeast Asia Public Health Nutrition (SEA-PHN) network, initiated Good Nutrition, Key to Healthy Children (GNKHC), a multi-country nutrition education programme for school children to be implemented in five member countries of the Network. In Malaysia, NSM is implementing the modules in 2 selected schools. The nine nutrition modules which include the basics of healthy eating and active living were developed by members of the SEA-PHN Network. Selected teachers shall by assisted by nutritionists appointed by the Nutrition Society/Association within the Network to roll-out nutrition module to Year 3 students.

MOH initiated HiTs, a nutritious meal programme targeted to primary school children. This is a collaboration of MOH and MOE. The meal consists of nutritious foods from cereals, meat, fruits and vegetable food groups and fulfilled the caloric and nutrient needs of children according to meal time at school. The one month menu cycle of the nutritious meal

is prepared by Nutritionists in MOH. Up to 2018, 28 schools in 5 states have participated in this initiative, with the most schools in Johore, where this initiative began.

In the public universities, healthy lifestyle programmes (HLP) have been part of research interventions among school children. HLP with two components; Nutrition education program and Healthy meals in school (adapted from HiTS) was carried out among school children in Batu Pahat, Johor. The goal is to increase nutrition and health knowledge and practices among teachers and children. The nutrition modules were adapted from HKP and were also made available in Bahasa Melayu, Chinese, and Tamil. For the healthy meals in schools, the canteen caterers were trained to provide healthy foods to students during school recess. A total of 41 teachers from three different schools were trained. 14 teachers from National Primary School, 15 teachers from National Primary School (Chinese) and 12 teachers from National Primary School (Tamil).

The Juara Sihat TM, another research intervention to promote healthy nutrition practices and physical activities was carried out among obese primary school children in Kuala Lumpur. Modules implemented in the intervention were modification of dietary intakes, promotion of physical activity, classroom curriculum focused on healthy eating and lifestyle and the involvement of PTA. The intervention was for 12 weeks. The Juara SihatTM programme showed significant improvements in anthropometric status, KAP scores and physical activity level. Overweight and obese children had a higher likelihood to improve nutrition KAP scores.

From this brief review, it can be noted that the current interventions among school children are of limited coverage and duration. It can be acknowledged that programmes by NSM and other non-governmental organisations are not sustainable. Those implemented by the academia are mostly for research purposes. There is ample evidence that there is a high prevalence of overweight and obesity among school children in the country. There is therefore an urgent need for all stakeholders in the public and private sectors to collaborate in designing and implementing comprehensive intervention measures in a systematic manner.

Promoting nutrition and physical activity: weight management program Trim & Fit

***Muhammad Asyraf* and Nor Azah A**

Health Department of Kuala Lumpur & Putrajaya

Research conducted by National Health Morbidity Survey (NHMS) 2015 showed that in Kuala Lumpur prevalence of overweight (33.7%) and obesity (14.9%), while in Putrajaya overweight (37.0%) and obesity (25.8%). Generally overweight and obese are linked with various health issues mainly non-communicable disease. With this alarming figure, thus an intervention must be done to the target group to control and reduce overweight and obese people. Nutrition Unit of Kuala Lumpur & Putrajaya come out with the initiative program called Trim N Fit, a combination of nutrition and physical activity component aim for various organization such as government workers, uniform bodies, and private institutions. Preliminary project started in 2016, with staff from Royal Malaysia Police, Bukit Aman, Kuala Lumpur who had a Body Mass Index (BMI) of 25.0kg/m² and above. The intervention program was conducted based on the recommendations in the Clinical Practice Guidelines on Management of Obesity 2004 (CPG, 2004), and Malaysian Dietary Guideline (2010). Modifications was done to increase participant's knowledge and practice of healthy lifestyle. Gymnasium or brisk walking exercises take place on weekdays for one hour while nutrition talk, individual counseling, body composition measurement, and outdoor activities running on monthly basis. Trim N Fit module currently expanded to Police Department in other states, Tenaga Nasional Berhad (TNB), Federal Department

of Town and Country Planning (PLAN), and a group of government pensioner. For school children, a special program called *Celik Nutrisi* was developed to promote physical activities by setting up football and netball academy, currently involved 15 schools in total. National Plan of Action for Nutrition of Malaysia (NPANM) III 2016-2025 aim to have at least three agencies implement this program per year, with standard guideline currently being developed. NPANM III also empowering *Komuniti Sihat Pembina Negara* (KOSPEN) to have such program with the same objective.

Nutrition of the elderly: Programme to promote healthy aging

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Malaysia is experiencing a rapid increase in its aging population and will be regarded as an aging nation by the year 2035. Although this phenomenon is a desirable index for being a developed nation, aging is also associated with increasing health problems and disabilities. In particular growing older increases nutritional risk, illnesses, chronic diseases, physical, cognitive and social challenges, racial ethnic, linguistic differences and low socioeconomic status. Epidemiological data showed that only a handful of Malaysian aged successfully and further the rate of disabilities among Malaysian elderly is higher than their counterparts. Nutrition is an important lifestyle factors for sustainable healthy longevity. Older adults should have access to food and nutrition programs that promote optimal nutritional status. According to the global recommendations, appropriate food and nutrition programs include sufficiently funded food assistance and meal programs, nutrition education, screening, assessment, counselling, therapy, monitoring, evaluation and outcomes documentation to ensure more healthful aging. All of these programmes have to be based on the needs of older adults, cost effective and sustainable. Several studies locally indicated that older adults are at risk of food insecurity, malnutrition and reported low access to financial assisted programme and health care. There is also a need to empower older adult, care givers and communities with knowledge and skills towards healthy aging. Nutrition element should be embedded in existing health and social programme for older adults. Further, nutritional programmes successfully implemented in other vulnerable groups such as young children and pregnant mothers should be expended for older adults. A multidisciplinary and collaborative effort involving relevant stake holders are need to ensure the planning and execution of a sustainable nutritional related programme to promote health aging.

Symposium 3: Young Researchers' Symposium

Does C.E.R.G.A.S programme improve body composition and anthropometric measurements in overweight/obese adolescents?

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C.E.R.G.A.S. (*Ceria, Respek, Gigih, Aktif, Sihat*) programme was developed to improve physical fitness (PF) among overweight and obese (O/O) adolescents as PF has been shown to be inversely associated with total body fatness among adolescents. The present study aimed to examine effectiveness of C.E.R.G.A.S. programme on body composition and anthropometric measurements among O/O adolescents in secondary schools. Three secondary schools in Selangor were assigned as intervention I (IG-I), intervention II (IG-II) and control (CG) group. Participants in IG-I school (n=52, 13.2±2.3 year-old) received additional physical activity (PA) education in a 2-day camp at a training centre, apart from standard Physical and Health Education school curriculum. IG-I group also underwent supervised aerobic and resistance exercise training sessions twice a week for 12 weeks at school. IG-II group (n=48, 13.4±2.1 year-old) received the same education programme as IG-I but had no exercise training sessions; whereas CG group (n=50, 13.2±2.4 year-old) received only standard Physical and Health Education school curriculum. Percentage body fat (%BF), waist circumference (WC), BMI-for-age z-score (BAZ) were measured at week-0 (baseline), week-12 (post-1), week-24 (post-2) and week-36 (post-3). IG-I demonstrated significant improvements in WC and %BF in post-1 (∆WC= -2.7cm; ∆%BF= -3.2%) and post-2 (∆WC= -2.2cm; ∆%BF= -1.8%). However, no significant improvement in BAZ was found. For IG-II and CG, no significant changes were observed in all measurements from baseline to post-3. Between-group differences were found in %BF and WC and in favour of IG-I at post-1. The results suggest that education plus exercise training is a more effective strategy to improve %BF and WC. In conclusion, C.E.R.G.A.S. programme has immediate positive effects in improving %BF and WC among O/O adolescents and is feasible to be implemented in a school setting. However, the long-term sustainability of a programme needs to be considered when planning to adopt on a large-scale; thus, it is necessary to study the sustainability of the C.E.R.G.A.S. programme.

Higher fast food consumption and poor attitude towards healthy meal preparation are risk factors for childhood obesity/overweight in Kuala Lumpur, Malaysia

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The obesity epidemic in growing children remains as a public health threat despite persistent efforts made over the years. Psychosocial factors toward healthy meal preparation may be important determinants that influence an individual's mind resulting in nutrition-related behaviour. Hence, this cross-sectional study aimed to identify psychosocial factors (knowledge, attitude, practice and self-efficacy towards healthy meal preparation) and dietary behaviour (fast food and breakfast consumption) as risk factors for childhood obesity/overweight. Stratified random sampling was used to select government primary schools (n=8) from zones in Kuala Lumpur. In total, 200 children aged 9 to 11 participated in the study. Psychosocial factors toward healthy meal preparation and dietary behaviour was assessed using a validated questionnaire while BMI z-score was calculated using AnthroPlus software. Almost half (47.4%) of the children were obese/overweight. Most children (90.5%) consumed fast food at least once a month meanwhile only half (56.5%) had breakfast every day. Furthermore, majority of the children (86%) were not actively involved in healthy meal preparation. More than half of the children had undesired scores for knowledge (59%), attitude (54%) and self-efficacy (54%). Logistic regression revealed that children with lower attitude towards healthy meal preparation (OR=0.873, 95% CI=0.784 to 0.973) and higher frequency of fast food consumption (OR=2.004, 95% CI= 1.394 to 2.880) were more likely to be overweight/obese. It was clear that most children had low psychosocial scores toward healthy meal preparation and were engaged in unhealthy dietary behaviour. Our findings

also revealed that children's attitude such as their perceptions, opinions and beliefs towards healthy meal preparation and fast food consumption were associated with their weight status. The psychological perspective should be targeted for changing children's nutrition-related behaviour in future intervention studies. In conclusion, experiential hands-on healthy meal preparation represents an innovative strategy to tackle childhood obesity in Malaysia and should be explored further.

Evaluation of school-based Healthy Lifestyle Program (HLP) for primary school children in Batu Pahat District, Johor

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The present study aims to determine the changes in nutrition knowledge, attitude, practice, eating behavior and body mass index-for-age (BAZ) before and after program between intervention and comparison groups. In this study, a Healthy Lifestyle Program (HLP) was designed to provide nutrition and health education for the children, as well as to empower and support them in practicing healthy lifestyle in school, in order to prevent overweight and obesity problem in primary school children. In HLP, trained teachers conducted three interactive and fun nutrition campaigns using *Program Pemakanan Sihat Ku* modules, and students were provided with healthier snacks during recess time. By applying quasi-experimental study design, six primary schools (Standard one to five) in Batu Pahat were randomly assigned into intervention and comparison groups. A total of 251 respondents in intervention group were participated in HLP, while 272 respondents in comparison group did not receive any intervention. All respondents were required to complete body weight and height measurements and a set of self-administered questionnaires that assessed nutrition knowledge and eating behaviors during pre-intervention and post-intervention. After the program, intervention group had higher nutrition knowledge, attitude and practice, lower percentage of breakfast skippers, lunch skippers and dinner skippers (p<0.05) as compared to the comparison group. There was no significant decrease in BAZ in the intervention group, but BAZ in the comparison group significant increased after the program. In conclusion, HLP is effective in improving nutrition knowledge, attitude and practice and meal consumption behavior among primary school children. A follow-up study is needed to evaluate the sustainability of the healthy lifestyle behaviors.

Effects of 16 weeks vitamin D supplementation on serum 25hydroxyvitamin D [25(OH)D] and parathyroid hormone (PTH) among women: randomised clinical trial of efficacy

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Vitamin D insufficiency is widespread globally, affecting all ages. In Malaysia, there are increasing reports on vitamin D insufficiency among women. This study investigated the effects of 16 weeks vitamin D supplementation on serum 25 hydroxyvitamin D [25(OH)D] and parathyroid hormone (PTH). A total of 106 healthy women aged 20-45 years were recruited for the trial. Subjects were randomised into four groups receiving 0, 600 IU, 1200 IU, 4000 IU vitamin D supplement per day. Fasting intravenous blood samples were collected at the start and end of the trial. Baseline mean serum 25(OH)D level was 29.9 ± 14.0 nmol/L. More than half of the subjects showed vitamin D deficiency (25(OH)D <30nmol/L), while another 40% were in the insufficiency category (25(OH)D 30-49 nmol/L). After 16 weeks, mean 25(OH)D was 43.2 ± 19.7 nmol/L, a significant increase of 40% from baseline. Mean 25(OH)D concentrations increased significantly among the test groups in a dose dependent manner, with the group receiving 4000 IU vitamin D supplement per day showing the highest increase. Serum intact PTH showed no significant change between pre- and post-supplementation in the test groups. In conclusion, vitamin D supplementation of 4000 IU per day, compared to 600 IU and 1200 IU, showed the highest efficacy for increasing serum 25(OH)D. Further investigations are recommended for a better understanding of the inverse relationship between serum 25(OH)D and PTH levels in women of reproductive age.

Food wastage in Malaysian public hospitals and the reasons behind it

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High level of food wastage in hospital is not new, and is often associated with malnutrition among patients. Low level food consumption has a direct impact on level of plate waste and patients' wellbeing. The aim of this study was to measure hospital plate wastage using visual estimation and to understand factors associated with patients' satisfaction with hospital foodservice. Plate wastage of 18-65 years old patients on normal diet and who consumed hospital food was observed after their mealtime. The observation was transferred onto Comstock 6-point scale in the questionnaire. The scale was recoded into percentage for calculation. Questionnaires were also distributed to record patients' socio-demographic, satisfaction and reasons for plate wastage. A total of 1106 questionnaire was collected from 24 public hospitals in Malaysia. Only 21.9% (n=241) finished all food served, 28.9% (n=320) left 1/4 of waste, followed by 24.7% (n=273) wasted half, 14.5% (n=160) wasted ¾ of the plate, 5.2% (n=57) took one bite, and 5% (n=55) wasted the whole plate. Majority of patients (46%, n=508) chose 'Different taste and preferences' as the reason for plate wastage, followed by 'No appetite' (33%, n=367), 'Inappropriate mealtime' (12%, n=135), 'Portion size' (5%,n=60) and 'Environment' (3%, n=36). Plate wastage was lower at a higher satisfaction level (r=-0.1, n=1106, p=0.005). Hospital location in this study (urban or rural area) showed a significant difference (p=0.03) in terms of plate wastage (M=4.21, SD=1.42; M=4.45, SD=1.29). Level of education was also significantly different (p=0.009) between secondary school and college for plate wastage Food wastage was lower when patients are more satisfied, hence factors leading to dissatisfaction should be addressed. Specifically, it can be reduced by tackling the taste and preferences issue, appetite and inappropriate mealtimes.

Symposium 4: Industry Contributions in Investing in Healthy Nutrition

Shaping the future of foods: food and nutrition leadership behind the scenes

Cyndy Au

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The future of food lies not in the form of the latest food product being produced, but in the way we think about food production and the way we eat. In merely 32 years from now, the world population is projected to increase to 9 billion by 2050 (United Nations, 2018) and socio-economic is expected to improve with people living longer. It is widely reported and repeated that food production is expected to increase by almost double to feed the growing population by then – a notion that can be challenged if we have the courage to think differently, act and lead. This begins with understanding trust determination and risk perception between civil society, government, food industry and academia, including media in respect to objectivity – arguably, the stakeholders in investing in nutrition for the population.

This paper aims to discuss on a new way of thinking in shaping the future of foods based on a clear sense of purpose to provide affordable, safer, healthier and more nutritious food. It focuses on three segments, in order of priority, that is integral to investing in nutrition: People, Process and Product. Shaping the current and future of foods is built on a wealth of knowledge – food science and nutrition expertise, market knowledge, regulatory know-how and the ability to bring a farm-to-fork perspective that is unique in producing food accepted by local tastes in applying global science. The paper will exemplify these based on global innovation networks, a commitment to rigorous clinical research and a long history of technology leadership. This paper also argues that having consumer insights such as healthy aging, understanding of innovation, convenience and nutrition but not knowing how to take those insights and apply them to help consumers address their challenges is as good as having the best strategy houses drawn but without real actions or progress that invests in the nutrition and health of the people.

It is hoped that this paper will nudge passionate up-and-coming food and nutrition leaders to have the courage to reflect and transform in the way one thinks – with objectivity and acknowledge teamwork in devising sustainable solutions that are efficient and effective to deliver food that is affordable, safe, healthy and nutritious for the community.

Effective ingredient choices for a prevention-oriented nutrition in obesity and diabetes mellitus – the evidence for prebiotic chicory root fibres and Palatinose™

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Malaysia has the highest prevalence of obesity and diabetes in Southeast Asia. As many as one in two Malaysians are overweight or obese, while diabetes mellitus now afflicts about 17.5% of adults, which has more than doubled since 1996. Diet plays a key role in changing the trajectory of the obesity and diabetes epidemic. Recent evidence underlines the potential of prebiotic chicory root fibres (inulin and oligofructose) and Palatinose™ (isomaltulose) to modulate weight management and reduce blood glucose levels. Chicory root fibres are among the few scientifically proven prebiotics. These indigestible carbohydrates selectively modulate the gut microbiota and confer benefits to human health. Notably, these health benefits include effects on appetite regulation, resulting in the intake of fewer calories, and the reduction of the blood glucose response when partially replacing sucrose or starches. These benefits are mostly linked to the prebiotic fermentation of chicory root fibres. This leads to the production of beneficial bacterial metabolites that influence the gut-brain axis and intestinal barrier function. The way in which nutritive carbohydrates supply their energy to the body also play a role. Palatinose™ is a fully available carbohydrate with slow-release properties. Due to its slower digestion by the body's enzymes, Palatinose™ releases glucose more steadily, which results in lower blood glucose and insulin profiles as compared to readily digestible carbohydrates. Moreover, Palatinose™ promotes fat burning. Recent research confirms the lower blood glucose response to Palatinose™ versus sucrose in various Asian populations. This suggests a particular benefit to Asians who have an even higher risk of developing overweight/obesity and diabetes due to a greater genetic predisposition. This presentation will give an overview and update on the latest science on how prebiotic chicory root fibres and Palatinose™ can support metabolic health, body weight and blood glucose management.

Effects of *Lactobacillus casei* strain Shirota (LcS) beyond digestive health

Kato A

Yakult Central Institute, Tokyo, Japan

Yakult was founded in 1935 in Japan, and since then, beneficial effects of our exclusive probiotic strain *Lactobacillus casei* Shirota (LcS) have been demonstrated based on a number of studies. Immune function is known to decline with age, and therefore elderly people are prone to infections, especially when living in a group. To control infectious disease risk in elder care facilities where infections easily spread out among the elderly residents, efficacy of LcS-fermented milk (FM) was evaluated. After 6 months of intake, the number of days with fever was significantly lower in the LcS-FM group than in the placebo group. In another study, continuous intake of LcS-FM reduced the incidence of infections in healthy middle-aged office workers. In this study, the effects of LcS-FM on upper respiratory tract infections (URTIs) during the winter season were evaluated. The incidence and duration of URTIs during the 12-week intervention period were significantly reduced in the LcS-FM group compared to the group given unfermented milk. The effects of LcS on psychological stress-induced symptoms are also gaining attention. We conducted randomized controlled trials evaluating the efficacy of LcS-FM on psychological stress-

induced symptoms in healthy medical students preparing for an upcoming examination. In the group given placebo starting 8 weeks prior to the examination, salivary cortisol level and incidence of physical symptoms (cold-like symptoms and abdominal symptoms) gradually increased toward the day of the examination, whereas these increases were significantly suppressed in the LcS-FM group. Furthermore, continuous intake of LcS-FM also improved stress-induced sleep disturbance. As presented here, there is growing evidence showing the beneficial effects of LcS beyond digestive health. We will continue our research on LcS to contribute to the health of people around the world.

Symposium 5a: Nutrition Research Updates

Anaemia in pregnant women attending antenatal care clinic in Cameron Highlands

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The first one thousand days of life is a period from the beginning of pregnancy until the child reaches the age of two years. The perfect health care during this period is very important and is seen as a "golden opportunity" to reduce the risk of non-communicable diseases in the future. During pregnancy, the body produces more blood to support the foetal growth. If the iron or B12 and folate supply are not adequate, red cells may not be produced enough to meet the demand. All pregnant women need to ensure weight gain in accordance with the duration of the pregnancy and also maintain haemoglobin levels at least 11gm% during pregnancy. Retrospective data was obtained from Maternal Child Health and Nutrition Counseling Record. Numerator is the total of anaemic women with haemoglobin level less than 11gm% and the denominator is total number of pregnant women attending antenatal care clinic. In Cameron Highlands, the achievement percentage of pregnant women with anaemia during the 36th week of pregnancy year 2014 to 2017 was achieved the Ministry of Health's Key Performance Indicator which is less than 9.0%. The highest number of anemia cases in Cameron Highlands is from the Klinik Leryar, ie from indigenous people in Pos Telanok and Pos Menson which is covered by Mobile Team. In 2017, a total of 42 pregnant women were anaemic compared to 2016 (n=23 cases) and were referred to the nutritionist. During a nutrition consultation session, factors causing anaemia among pregnant women were found to be due to the inavailability of balanced diet, lack of knowledge on iron-rich foods, over-pregnancy gap factors and the large number of family members. The mobile team needs to increase the earlier detection of anaemia cases so that they can be better dealt with at 36 weeks of pregnancy. Pregnant mothers are encouraged to adhere to routine antenatal check-up to ensure the wellbeing of mother and child. Health professionals need to raise awareness about the importance of antenatal nutritional care.

Calcium intakes among milk drinkers and non-milk drinkers in prepubertal children aged 9 to 11 years old from low income families in Kuala Lumpur – the PREBONE-Kids study

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During growth, calcium is one of the key nutrients for strong bones, attainment of peak bone mass and prevention of osteoporosis in later life. The objective of this study is to compare the calcium intakes and contributing food sources between milk drinkers and non-milk drinkers in prepubertal children aged 9-11 years old. This cross-sectional study was conducted in 211 school children from low income families in Kuala Lumpur obtained from baseline data in the effects of prebiotics on bone health in prepubertal children (PREBONE-Kids) study. Calcium intakes and food sources were assessed using a semi-quantitative calcium food frequency questionnaire (FFQ). Median calcium intakes of milk drinkers (339 ± 278 mg/day) was significantly higher (p<0.001) than non-milk drinkers (216 ± 182 mg/day). Among milk drinkers, the major sources of calcium were milk (26%) and cocoa-based malted beverages (25%). For non-milk drinkers, the major source of calcium was cocoa-based malted beverages (30% of total calcium intakes). Nevertheless, milk drinkers only drank ½ a serving (107 ± 138 mls/day) 2-3 times a week compared to the recommended 2-3 servings per day by the Malaysian Dietary Guidelines for Children and Adolescents (2013). In conclusion, low milk drinking habit led to poor calcium intakes whilst cocoa-based malted beverages can help to increase calcium intakes in prepubertal children from low income families. Research funding and support are provided by Tate and Lyle Health & Nutritional Sciences.

Self-efficacy and home food availability is associated with healthy meal preparation practices in Kuala Lumpur children

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The practice of healthy meal preparation is associated with better diet quality and good nutrition in children. Thus, this cross-sectional study aimed to determine factors associated with good practices of healthy meal preparation among children aged 9 to 11. Stratified random sampling was used to select primary schools (n=8) from all zones in Kuala Lumpur. A total of 200 children-parents pair participated in the study. Children and their parents received validated questionnaires of healthy meal preparation and home food availability respectively. Knowledge, attitude, self-efficacy, practice and home food availability scores were converted to percentages. Children's BMI z-scores were computed using AnthroPlus software. Approximately half (47.4%) of the children were overweight/obese and more than half (67.0%) of parents were concerned about their child becoming

overweight. The mean score (SD) for self-efficacy towards healthy meal preparation, fruits and less healthful ready-to-eat food at home was 75.9% (13.3%), 30.6% (17.0%) and 50.1% (21.1%) respectively. Besides, mean score (SD) for healthy meal preparation practice was only average at 60.9% (14.7%). There was no significant difference (p=0.904) of practice score across all BMI categories. Multiple linear regression showed that higher self-efficacy towards healthy meal preparation (β=0.43, p<0.001) and increased availability of fruits at home (β=0.21, p=0.007) was associated with higher healthy meal preparation practices. Additionally, lower availability of less healthful ready-to-eat food (β=-0.36, p=0.015) such as sweets and instant noodles was associated with higher healthy meal preparation practices. Findings revealed that children's confidence and belief that they can accomplish healthy meal preparation tasks and their home food environment may be a significant driving force that lead to the actual behavior of preparing healthy meals. In conclusion, sense of self-efficacy and home food availability should be improved to encourage the practices of healthy meal preparation in children.

Dietary quality of postmenopausal Chinese women in Kuala Lumpur and Selangor

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Diet quality has recently gained considerable attention in nutritional research, but studies on diet quality among older Malaysian, especially among the postmenopausal Chinese women, which has the longest longevity is scarce. Thus, this cross-sectional study aimed to assess the dietary quality among postmenopausal Chinese women. A total of 220 respondents were recruited from seven affiliates under the National Council of Senior Citizens Organisations Malaysia (NACSCOM). Eligible respondents were interviewed face-to-face through a validated semi-quantitative Food Frequency Questionnaire (sFFQ) which assessed on dietary intake for past one month. Household measurements were used to assist respondents in estimating portion size of food and beverage consumed. The physical activity level of respondents was assessed with Global Physical Activity Questionnaire (GPAQ) and classified into sedentary, moderate or high physical activity level. The overall dietary quality of respondents was assessed according to Healthy Eating Index for Malaysia (HEI-M), stratified by physical activity level. The respondents were classified into poor, improvement required, or good according to the overall dietary quality score. The mean age of respondents was 66.47±6.62 years. In general, the respondents met the recommended number of serving for cereal and grains (3.98±1.65), fruits (1.93±1.70), poultry, meat and egg (1.61±1.05), but failed to meet the recommendation for vegetables (2.49±1.58), fish (0.66±0.79), legumes (0.39±0.41) and milk and dairy products (0.11±0.50). Means percentage of energy from total fat (18.54±5.11%) and sodium intake (1388.03±872.70mg) were comply to the recommendation. The overall mean score for dietary quality was 61.11±9.08. Majority of the respondents (87.3%) required improvement on their dietary quality, while 10.9% of the respondents had poor dietary quality, and only 1.4% of them had good dietary quality. In conclusion, present study suggested that majority of the postmenopausal Chinese women required improvement on dietary quality, with special attention to be addressed on the number of serving for vegetables, fish, legumes, milk and dairy products.

Sunnah intermittent fasting influence endocrine marker and oxidative pathway among mild cognitive impairment of older adults

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Lifestyle, environmental and nutritional status are the factors that contribute to the mild cognitive impairment (MCI). The objective of this study is to examine the influence of SIF on endocrine marker and oxidative pathway among MCI older adults. Comparative cross sectional study (baseline and 36 months) was applied for this study. A total of 99 subjects of MCI aged ≥ 60 years and have no terminally ill diseases involved in the study. Subject were divided into three group according to their frequency of practicing SIF (regular, irregular and non-SIF). Ten ml of whole blood, socio-demographic and cognitive assessment data was taken. The blood collected are used to determine oxidative markers (MDA and C-reactive protein (ELISA KIT)) and endocrine marker (insulin-ELISA Kit). MMSE, IADL, ADL and GDS was conducted to determine the cognitive function. The study found SIF groups shown improvement in their cognitive status after 36 months where 12% of MCI older adults shifted into successful aging while 51.5% of MCI groups shifted into usual aging and others who are non-SIF were maintained in MCI group. The results shown that regular-SIF groups reduce oxidative stress markers significantly after 36 months as compared to non-SIF groups (MDA: regular-SIF baseline vs 36 m/o, 87.59±30.23 nmol/mg protein vs 56.01±13.41 nmol/mg protein; non-SIF baseline vs 36 m/o, 94.34±51.33 nmol/mg protein vs 116±36.82 nmol/mg protein; CRP, regular-SIF baseline vs 36 m/o, 0.91±0.19 mg/l vs 0.63±0.11 mg/l; non-SIF baseline vs 36 m/o, 2.87±0.11 mg/l vs 3.49±0.61 mg/l) and as well as endocrine markers (insulin: regular-SIF baseline vs 36 m/o, 111.14±22.69 pmol/l vs 83.0±37.46 pmol/l; non-SIF baseline vs 36 m/o, 297.54±51.47 pmol/l vs 365.73±2.53 pmol/l). In conclusion, SIF ameliorates MCI condition via both endocrine and oxidative pathway, hence providing a novel way forward towards healthy aging.

Effectiveness of Kelulut honey in improving the neurocognitive functions of middle-age Malay women

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Neurocognitive decline starts in the middle of adulthood with memory and executive functions as the most affected domains. Honey is a natural food consisting of about 200 compounds with various health benefits. Kelulut honey is the native stingless bee honey produced by *Trigona* spp. bees in Malaysia. Honey from *Apis* spp. in Malaysia was the most studied one that caused limited knowledge and information on health benefits of honey from stingless bees. This study bridges the gap by using Kelulut honey as intervention material in order to provide more information pertaining to the effect of this honey towards cognitive functions.

This study was conducted to evaluate the effectiveness of Kelulut honey on neurocognitive functions among middle-age Malay women. A total of 42 participants (22 for intervention arm and 20 for control arm) aged 40-60 years was recruited. This quasi-experimental study spanned for 12-weeks in which the intervention subjects consumed 30g of honey daily while the control subjects were required to maintain their typical dietary habits and physical activity level. Malay Version Auditory Learning Test (MVALT), Benton Visual Retention Test (BVRT) and Comprehensive Trail Making Test (CTMT) were used to assess verbal memory, non-verbal memory and executive functions, respectively. The results revealed intervention subjects had better immediate (11.57±3.37) and delayed (11.61±2.48) verbal memory as compared to pre-intervention scores (9.96±3.17 for immediate memory; 10.14±2.78 for delayed memory). The non-verbal memory was improved from 6.10±1.51 to 7.00±1.76 in intervention subjects. The executive functions were improved as indicated in the reduced administration time of CTMT from 312.13±10.97s to 237.05±74.75s in intervention group. Honey is effective in improving neurocognitive functions and the effects may be ascribed to its phenolic content. This study provides supporting evidence for the national efforts in promoting Kelulut honey as the national first superfood.

Symposium 5b: Nutrition Research Updates

Mother and Infant Cohort Study (MICOS): study rationale and preliminary findings on vitamin D levels among third-trimester Malaysian pregnant mothers

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Epidemiological evidences show that malnutrition and allergic diseases during early childhood shared similar protective and risk factors. This paper describes the protocol of the Mother and Infant Cohort Study (MICOS) that aims to determine the contribution of early nutrition on the development of malnutrition and allergic diseases in infants' first year of life. The MICOS is a prospective cohort study that enrolled third-trimester pregnant women and followed-up prospectively at 3, 6, and 12 months postpartum together with their infants. While the study is still on-going, this study reports the preliminary findings on the associations of socio-demographic characteristics, pre-pregnancy BMI, gestational weight gain with vitamin D levels. A total of 508 mothers who attended at selected government health clinics participated in this study. The pregnant mothers were requested to complete a set of questionnaire that assessed socio-demographic characteristics, self-report pre-pregnancy weight, and height, while data on obstetric history and gestational weight gain were obtained from the medical record book. Blood samples were collected to determine 25-hydroxyvitamin D (Vitamin D) levels. The present study found that almost half of the pregnant women had vitamin D deficiency (47.8%) and 43.9% had insufficient vitamin D. The study found that 64.3% of the Chinese pregnant mothers had insufficient Vitamin D, whereas Malays (50.3%) had the highest prevalence of vitamin D deficiency (χ^2=19.032,

p<0.05). All pregnant mothers from the low-income group faced either vitamin D deficiency (51.1%) or insufficiency (48.9%) problems (χ^2=13.413, p<0.05). While two in five (40.5%) of the pregnant mothers had overweight and obesity problem at the pre-pregnancy stage, 49.5% of the mothers were found to have gained weight excessively and 28.0% of the mothers had inadequate gestational weight gain. Maternal serum 25(OH)D concentrations significantly associated with gestational weight gain (F=3.296, p<0.05). Hence, there is an urgent needs on Vitamin D intervention among the pregnant women.

Improved anthropometric and metabolic profile in Malaysian adults – A 6 month dietary intervention with 30% calories from protein

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Providing tailored dietary recommendation to individuals may be key to manage body weight in overweight and obese Malaysians. The objective of this study was to assess the effectiveness of a dietary intervention programme to improve body composition and reduce obesity-related metabolic parameters in Malaysian adults. 82 overweight and obese Malaysian adults (BMI≥23kg/m^2), with average age of 41.6±0.9 years were randomized to either a control group (n=38) or a 6 month dietary intervention group (n=44). Subjects in the intervention group received individualized diet counseling based on their habitual food preferences. This prescribed diet introduced a) 300-500kcal reduction per day based on the individual's baseline calorie intake, b) 30% calories from protein, 30% calories from fat and 40% calories from carbohydrate, c) dietary fibre ≥25g/day and d) Vitamin E ≥15mg/day. The control group received general dietary and lifestyle advice at baseline and at intervals of 30 days. Paired sample t-test revealed significant reduction in weight (-3.4±0.6kg; p<0.001), BMI (-1.4±0.2; p<0.001), WC (-8.1±0.9cm; p<0.001), fat mass (-3±0.6kg; p<0.001), body fat percent (-2.2±0.7%; p<0.001), SBP (-4±1.7mmHg; p<0.001), DBP (-4.2±2.0mmHg; p=0.002), pulse rate (-5.4±1.8; p=0.005), fasting insulin levels (-4.2±1.7uU/mL; p=0.021), HOMA-IR (-1.3±0.6; p=0.043), LDL-C (-0.2±1.1mmol/L; p<0.001), and hsCRP levels (-1.5±0.8mg/L; p=0.05) in the intervention group. While in the control group, following was observed; significant increase in weight (2.2±0.5kg; p<0.001), BMI (0.9±0.2; p<0.001), WC (2.1±0.4cm; p<0.001), WHR (0.02±0.01; p<0.001), fat mass (2.2±0.7kg; p=0.001), FFM (0.6±0.3kg; p=0.045), body fat percent (1.0 ±0.4%; p<0.001), fasting insulin levels (6.3±1.1uU/mL; p<0.001), HOMA-IR (2.0±0.4; p=<0.001) and reduction in LDL-C (-0.1±1.3mmol/L; p<0.001), SBP (-2.9±2.0mmHg; p<0.001) and pulse rate (-5.5±1.7; p=0.002). Changes in triglyceride levels were not significant between baseline and post-intervention. Individualized dietary intervention with 30% calories from protein was effective in improving body composition, blood pressure, fasting insulin levels, insulin sensitivity and serum lipid levels in overweight and obese Malaysian adults.

Drinking water salinity and the associated risk of raised blood pressure in young reproductive-aged women in coastal Bangladesh: a cross-sectional study

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Coastal areas of Bangladesh are experiencing high sodium concentration in drinking water sources that are commonly consumed by the local population. The effect of consuming high saline water on health in young age is limited. This research aimed to investigate the association between sodium intake from drinking saline water and blood pressure in young reproductive-aged women in coastal Bangladesh. The study was cross-sectional in design and was conducted among 478 young reproductive-aged women (18-30 years old) in three sub-districts with the highest salinity affected areas in Jessore district of Bangladesh. Spot urine and drinking water were collected and measured for sodium levels. Average estimated sodium intakes from drinking water ranged from 0.2 to 3.5 g/day. Average daily sodium excretion in urine was 3.8 g (range, 2.3-6.7 g). About 34% and 36% of the women were found to have raised systolic (≥ 120 mmHg) and diastolic (≥ 80 mmHg) blood pressure, respectively. After adjustment for confounders, it was found that the likelihood that a woman had raised systolic and diastolic blood pressure were significantly related (P<0.001) to consuming sodium from saline water and increased urinary sodium excretion. Women who were in the highest intake tertile of drinking water sodium (1.1 to 3.5 g/day) had significantly 4.1 and 2.6 times higher odds of having raised systolic and diastolic blood pressure, respectively compared to the consumers in the lowest tertile (0.2 to 0.4 g/day). Moreover, increased urinary sodium excretion (3.9-6.7 g/day) was also found as a risk factor for raised systolic (OR= 3.1; 95% CI, 1.7-5.7) and diastolic blood pressure (OR= 3.3, 95% CI, 1.8-5.9). Our research shows that sodium intake from drinking water is associated with raised systolic and diastolic blood pressure in young reproductive-aged women in the saline affected coastal areas of Bangladesh.

Dietary acid load and risk of diabetes mellitus among postmenopausal Chinese women

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Dietary acid load has been found to be associated with chronic diseases especially cardiovascular disease, diabetes, cancer and osteoporosis. Most of the above studies were conducted among Caucasian with limited information available among postmenopausal Asians population. The purpose of this cross sectional study was to evaluate the prospective relationship between dietary acid load and risk of diabetes among postmenopausal Chinese women. A total of 217 participants aged 51-85 years, were recruited from 8 out of 15 affiliates of the National Council of Senior Citizens Organizations Malaysia (NACSCOM). Sociodemographic, lifestyle factors, medical history, anthropometric data and biochemical samples were collected during visitation. Dietary acid load was estimated as potential renal acid load (PRAL) and net endogenous acid production (NEAP) from nutrient intake assessed

by a validated semi-quantitative food frequency questionnaire (FFQ). Average PRAL score was 13.44 ± 19.08 and NEAP score was 72.37 ± 29.88 that were comparative to other Caucasian studies. Multivariate linear regression analysis revealed that PRAL (standardized regression coefficient = 0.139, p = 0.039, 95% CI 0.000, 0.013) was positively associated with blood glucose level after adjusted for covariates (age, years of postmenopause, physical activity level activity intensity, year of education), but not NEAP score (p = 0.198, 95% CI -0.001, 0.007). Using fasting plasma glucose as the surrogate measure for risk of diabetes, our findings suggest that a high dietary acid load PRAL score was associated with an increased risk of diabetes mellitus in postmenopausal Chinese Women. Further studies including cohort and interventional studies modifying acid-base dietary intake are essential to delineate the possible role of low dietary acid load for the prevention of diabetes mellitus.

Association between sleep disturbance and lipid profile in Malay women with low vitamin D levels

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Poor sleep quality has been linked with serum low vitamin D and impaired lipid profile in both adults and children in some ethnics. Since there is no data available for Malaysian population, this study is aimed at assessing association of serum vitamin D level, lipid profile and sleep disturbance among Malay women. An analytical cross sectional study was done in Selangor state, Malaysia. 25-hydroxyvitamin D (25(OH)D), lipid profile, fasting glucose were assessed using overnight fasting venous blood. Body mass index (BMI) was examined following standard protocols. Sleep quality was ascertained using Pittsburgh Sleep Quality Index (PSQI). A total of 54 Malays women (Mean age 30.7±6.02) were recruited. All women were in low vitamin D level (89% < 50nmol/L & 11% 50-74nmol/L). About 41% of participants have normal BMI whilst 52% were either overweight or obese. Fasting glucose were normal in 94% (n=51) participants. About 58% (n=31) of participants have high total cholesterol (more than 5.2mmol/L), however, triglyceride (TG) (less than 1.7mmol/L) was normal in 92.6% of participants. About 83% (n=45) of participants have high serum Low-density Lipoprotein cholesterol (LDL-C) (more than 2.6mmol/L) but only 11% (n=6) have normal High-density Lipoprotein (LDL-C) (less than 1.2mmol/L). Global PSQI scores shown that majority of participants (63%) have poor sleep quality (mean score 5.93±2.84). Sleep disturbance were common among 98% of participants. Majority of participants have 5 to 6 hours sleep at night (39%) whilst 10% have less than 5 hours sleep at night. Overall sleep quality is not significant associated with lipid profile and vitamin D level. Normal HDL was not significantly associated with poor sleep quality. In conclusion there is no association between sleep disturbance and lipid profile in Malay women with low vitamin D level. This study will continue the participant recruitment to achieve targeted sample size in future.

The relationship between education, occupation, and family support with exclusive breastfeeding (case study in Perak Timur Public Health Center Surabaya)

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Breast milk is an ideal food for babies to achieve optimum physical growth. Growth and development of children will affect the cognitive function and intelligence of children. Factors affecting exclusive breastfeeding among others level of knowledge the family and family support in exclusive breastfeeding. This research aimed was to analyze the relation of education, occupation, and family support with exclusive breastfeeding in Perak Timur Public Health Center, Surabaya. This research is a cross sectional descriptive analytic research. The population is all mothers and their children aged 2-5 years who joined in Posyandu Melati Perak Timur Surabaya Public Health Center. While the sample is the mothers and their children who meet the inclusion and exclusion criteria. The population is 71 people. Determination of the number of samples using simple random sampling and it gets as many as 41 respondents. Data analysis was done by Chi-square test using Epi Info program. The result showed there is a relation between family support (p=0,017), occupation (p=0,017) with exclusive breastfeeding, but not so with education (p=0,07). A member of the greatest role in providing suppot is the husband and parents. It is concluded that mothers with good family support and mother that not worked outside likely to breastfeed exclusively. It is therefore recommended exclusive breastfeeding counseling are devoted exclusively to the family.

Symposium 5c: Nutrition Research Updates

Infant and young child feeding amongst Penan children in rural Sarawak: qualitative findings

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Earlier studies have reported malnutrition amongst Penan children. This study is part of an infant young child feeding research amongst Penan children aged 6 to 23 months. The objective of this study was to explore factors contributing to poor feeding practices in a sample of Penan children. Data collection was carried out in 2 localities in Belaga district, Sarawak between December 2016 to June 2017. Respondents consisted of mothers with children below the age of 24 months and a total of 17 in-depth interviews were conducted. Interviews were transcribed using *ExpressScribe Pro* software version 6.04. Thematic analysis was carried out using *Atlas.ti* software version 8.1.3 and initial codes were generated and collated into sub-themes reflecting the main themes in this study. The main themes identified are poor complementary feeding practices, observance of specific food taboos, having limited access to food, communalistic food-sharing is practiced and low nutrition knowledge. Poor feeding practices included early complementary feeding, late introduction of foods from animal-sources, feeding only vegetables when meat was unavailable and feeding a limited variety of fruits and vegetables. Food taboo practices include not feeding certain types of meat and fish, as well as ferns and bitter vegetables.

Sub-themes identified under limited access to food include respondents having difficulty in getting meat, fish, fruits and vegetables. Communalistic food-sharing is still practiced although there is awareness that this practice is changing. Mothers also expressed their lack of nutrition knowledge and how this affects the feeding practices. Effort to improve feeding practices amongst children in this vulnerable population includes addressing food availability.

Dietary intake, nutritional status and caries experiences among cerebral palsy children in Kelantan: a community intervention study

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This study aimed to evaluate the changes in dietary intake, nutritional status and caries experiences after an intervention among cerebral palsy (CP) children. A community intervention study was done among 93 CP children aged 5-17 years (without feeding tube) registered at Kelantan Community-Based Rehabilitation Centers. Dietary intake was captured by using 24-hour diet recall and cariogenic food frequency (CFF) questionnaire. Assessment of nutritional status involved weight, height and mid-upper-arm circumferences (MUAC). Caries experiences were determined by using DMFT/dft index. The variables were assessed during three visits of the 3-month interval study. Nutrition and oral health talks (ON-CP Package Module) were given to the parents/caregivers during the first and second visits (intervention group). Data were entered in IBM SPSS version 24.0 and analyzed by using repeated measures ANOVA. The significant level was set as <0.05. Mean (SD) age of the CP children in intervention (n=45) and control (n=48) groups were 11.9 (4.77) and 12.1 (5.04), respectively. No significant changes was found in the nutrient intake for both groups. Energy, calcium and fat of both groups were less than the recommended intake at all level. While protein, iron, vitamin C, vitamin A and sugar were more than the recommended intake. There was a significant increase in the CFF scores in control group (P=0.003). Significant increases were also found in the nutritional status of the intervention [weight (P<0.001), height (P=0.004) and MUAC (P=0.035)] and control [height (P<0.001)] groups. Caries experiences of both groups were at the moderate level (mean DMFT 3.18-4.09) and significant increases of the mean DMFT scores were found among the control group (P=0.011). Both nutritional and non-nutritional factors play a role in the nutritional status of the CP children. These results also indicate that controlling the frequency of cariogenic food intake resulted in controlling the caries experiences of the children.

Association between attraction to physical activity and physical activity level among primary school children

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Childhood obesity has being associated with low physical activity level. However, little is known about the influence of psychosocial factors, particularly children's attraction to physical activity (CAPA) on physical activity participation among children. The aim of this study was to examine the relationship of CAPA with physical activity among primary school children in Kuala Lumpur. A total of 221 children (106 boys; 115 girls) aged 7

to 10 years were recruited from 10 national schools in Kuala Lumpur. Information on socio-demographic background was obtained from a parent-reported questionnaire. CAPA and physical activity level information were obtained from parent-proxy reported CAPA questionnaire and Physical Activity Questionnaire for Older Children (PAQ-C), respectively. Mean age, weight, height and BMI were 9.02 ± 1.11 years, 30.1 ± 9.2 kg, 131.8 ± 8.8 cm, 17.0 ± 3.6 kg/m^2, respectively. Median CAPA score was 3.08 (0.56) and PAQ-C score was 2.38 (0.80). There were no statistical differences in age and anthropometric measurements between boys and girls. However, median scores of CAPA and PAQ-C were found to be significantly higher in boys than girls (p<0.05). Boys' PAQ-C score were found to have significant and positive correlation with CAPA overall score (r=0.204, p<0.05) and its subscales, liking games and sports (r=0.297, p<0.01) and liking vigorous physical activities (r=0.223, p<0.05). Girls' PAQ-C score significantly correlated with CAPA score (r=0.251, p<0.01) and only one CAPA subscale, that is peer acceptance in games and sports (r=0.341, p<0.01). This study concluded that higher attraction to physical activity is associated with higher level of physical activity participation among primary school children. Hence, strategies that aim to increase children's participation and adherence to physical activity should consider various means to improve children's attraction to physical activity.

Associations between fluid intake, hydration, Body-Mass-Index and cognitive function among adolescents in Selangor, Malaysia

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Hydration and fluid intake has been linked to obesity and poorer cognitive function in adults but was not well examined among the adolescents. The objective of this study was to examine the associations between hydration status, fluid intake, BMI-for-age and cognitive function among adolescents in Selangor, Malaysia. A total of 230 adolescents aged 10-14 years participated in this cross-sectional study. Body weight and height of the respondents were measured and BMI-for-age was calculated. Urine colour chart was used to measure hydration while fluid intake was assessed using the Beverage Intake Questionnaire (BEVQ-15). Cognitive function (FIQ) was measured using the Wechsler's Intelligence Scale for Children (WISC-IV). A total of 13.0% of the adolescents were overweight and 1.3% were obese. Only a quarter (24.3%) of the respondents were well-hydrated whereas more than half (59.6%) of the adolescents were insufficiently hydrated and some were dehydrated (16.1%) according to the urine colour chart. The mean total daily fluid intake for boys (2149.26 ± 1070.17 ml/day) was significantly higher than girls (1680 ± 724.61 ml/day) (p<0.05). Similarly, the mean total daily intake of sugar-sweetened beverages for boys (970.52 ± 738.78 ml/day) were significantly higher than girls (673.54 ± 543.86 ml/day) (p < 0.05). Only water intake was found to be negatively correlated with urine colour (p<0.05). Hydration status was found to be associated with cognitive function where significantly higher FIQ scores were found among well-hydrated (101.61 ± 14.43) adolescents compared to their dehydrated (94.67 ± 7.90) and insufficiently hydrated (97.65 ± 10.65) counterparts (p < 0.05). No significant association was found between fluid intake and hydration status with BMI-for-age. These data suggest that dehydration is associated with poorer cognitive scores but not with BMI-for-age. Further studies are needed to better understand the underlying mechanism of these relationships.

Vitamin D deficiency and its associated factors among older adults in Alborz province, Iran

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Vitamin D was noted as a nutrient important for bone health and its spectrum of actions is now essential for every major body function such as endocrine, autocrine and paracrine. Nevertheless, there is a paucity of studies assessing vitamin D deficiency and its associated factors among older adults in Iran. This cross-sectional study aimed to assess vitamin D deficiency and its associated factors among older adults in Karaj city, Alborz province in Iran. A total of 422 older adults aged between 60 and 80 years old were interviewed and their information on socio-economic (SES) characteristics, food insecurity, sun exposure and dietary intake were obtained using questionnaires. Anthropometric measurements including height, weight and waist circumference were measured by a trained researcher and body mass index (BMI) was estimated. Fasting venous blood samples were collected for quantifying serum 25-hydroxy vitamin D [25(OH)D] level. Vitamin D deficiency as well insufficiency was defined as a serum 25(OH)D less than 30 ng/mL. Adjusted logistic regression was used to identify associations between vitamin D deficiency and SES, food insecurity, sun exposure, dietary intake and anthropometric measurements. Out of 422, 134 (31.7%) older adults were food insecure while the prevalence of vitamin D deficiency was 70.9%. More females than males were food insecure as well as vitamin D deficient. Logistic regression indicated that being a housewife significantly associated with increased the risk of serum 25(OH)D deficiency compared to other occupations (OR = 1.914; 95% CI: 1.211-2.240). Greater odds of being 25(OH)D deficient were observed among those subjects whose body mass index (BMI) were more than 27 kg/m^2 compared to those with normal BMI (OR =1.895; 95% CI = 1.629 - 2.331) and among those hypertensive individuals compared to those non-hypertensive individuals (OR=1.596; 95% CI =1.316-1.987). Low sun exposure significantly associated with increased risk of serum 25(OH)D deficiency by more than one fold (OR= 1.350; CI=1.592-2.657). Food insecurity was not associated with increasing risk of 25(OH)D deficiency (p>0.05). The prevalence of vitamin D deficiency is high among older adults in Alborz province, Iran. Older adults who were housewives, hypertensive, overweight or obese and had low sun exposure were more likely to be vitamin D deficient. Further studies are needed to substantiate these findings and for the development of appropriate interventions to improve serum 25(OH)D levels in older adults.

Metabolic responses to isomaltulose by Malaysian Chinese adults: A pilot study

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Isomaltulose (also known as “Palatinose”) is an isomer of sucrose, in which glucose is α–1,6 linked to fructose. The maximum tolerability of Malaysian adults to fixed doses of isomaltulose (25 g, 50 g, 75 g, 100 g) was investigated by serial measurements of

breath hydrogen. A response of > 20 ppm was considered as an indication of spill-over of isomaltulose to the colon. Twenty-eight consenting participants [10 males, 18 females, 20 - 36 years of age, with body mass index (BMI) ranging from 15 – 31 kg/m^2] underwent crossover studies using a portable apparatus over five hours. Thirty six percent (n= 9/25) participants gave evidence of spill-over at 75 g and 19/28 (70 %) to 100 g of isomaltulose. In 6 males and 11 females, glycaemic responses were compared to sucrose with a two-week washout period. The blood glucose response to isomaltulose (6.6 ± 0.9 SD mmol/L) was significantly lower than to the same bolus of sucrose (8.7 ± 1.8 SD mmol/L; p = 0.001). In order to test the potential of prebiotic effects of isomaltulose, changes in faecal pH were measured. Faecal samples (n = 10) were collected before and after ingestion of 75 g isomaltulose. The acidity of both the first (pH 6.7 ± 0.9 SD; p = 0.023) and second (pH 6.9 ± 0.8 SD; p = 0.032) subsequent faecal samples was significantly greater than pre-test samples (pH 7.5 ± 0.4 SD), suggesting that isomaltulose may possess a prebiotic potential. At the present time, the quantities of isomaltulose available in the Malaysian diet appears to be well-tolerated. The low glycaemic and prebiotic potential of isomaltulose suggest that it potential as an alternative sweetener. However, the possible effects of co-administration of isomaltulose with other carbohydrates needs further investigation.

Poster Presentations

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

A01 The influence of body fat on the association of serum 25-hydroxy Vitamin D and muscle strength in postmenopausal Malaysian Malay women

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The influence of body fat on the association of serum 25-hydroxy vitamin D and muscle strength in postmenopausal Malaysian women is poorly understood. The objective of this study was to evaluate the association between muscle strength (muscle mass, appendicular muscle mass, and grip strength), body fat percent (BF%) and serum 25-hydroxy vitamin D (25OHD) in postmenopausal Malaysian Malay women. Eighty-eight (n=88) postmenopausal Malaysian Malay women aged (mean±SD), 59.8±7.5 y, were assessed for muscle strength and related anthropometric indices. Fasting blood was available from 24 of the participating women. Sixty-six participants were either overweight or obese (BMI≥23kg/m^2). More than 80.0% of the women had serum 25OH VitD deficiency (<37.5 nmols/L) (mean± SE) 8.3±2.2 nmol/L; 12.5 % were serum 25OH VitD insufficient (37.5-75 nmols/L) 44.5±2.2 nmols/L and only 4% were Vit D replete. We found significant positive association between total serum calcium levels and grip strength (r= 0.42; p=0.04). Grip strength (GS, measured by handgrip dynamometer) (mean±SD) was not significantly different between the deficient and insufficient groups (21.6±5.7kg v 18.7kg±4.9 respectively; p=0.41). Serum 25OH Vit D was inversely correlated (non-significant) with iPTH (parathyroid hormone), BF%, and all muscle strength indices. However, after adjusting for age and adiposity (BMI, BF% and WC), a significant difference in the association between grip strength and 25OHVit D) was found. Unadjusted r=-0.29; adjusted r=-0.47; (p≤0.05). The findings of this study suggest that body fat could be a potential confounder in the association between serum 25OH VitD and GS. The authors opine that in postmenopausal women, benefits of available Vit D in circulation can be maximised with increase in muscle mass and decrease in body fat through intervention.

A02 Malnutrition among Orang Asli children in Hulu Perak and Gua Musang

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Malnourished Orang Asli children who had undergone refeeding programme will usually need post-discharge care to ensure good nutritional status. The aim of this study is to determine the nutritional status among Orang Asli children below 6 years old following discharge from refeeding programme in government hospitals. A cross-sectional study was conducted among 52 boys and 42 girls who were recruited based on discharge list from the district hospital. Data collection involved administration of questionnaires for demographic data and anthropometric measurements during home visit. Respondents comprised children of Temiar (84.0%), Jahai (13.8%), Bateq (1.1%) and Mendriq (1.1%)

ethnicity. Mean age of the children was 35.9±15.8 months, and 73.4 % was aged two years and above. Mean body weight and height were 10.0±1.9 kg and 82.8±8.4 cm, while mean mid upper arm circumference was 13.3±1.1 cm. Mean skinfold thickness at triceps and subscapular were 9.6±2.0 mm and 5.0±1.2 mm, respectively. Mean *z*-score of weight-for-age, height-for-age, weight-for-height and BMI-for-age were -2.8±0.8, -3.3±1.1, -1.4±1.0 and -0.9±1.0 respectively. Based on WHO 2006 and 2007 weight-for-age, height-for-age and BMI-for-age growth standards, 83.0% were underweight, 90.4% stunted and 10.6% wasted. In conclusion, although the children were discharged from hospital when they had good weight gain and were no longer malnourished, incidence of malnutrition post-discharge still occurs and remains a problem when they return to their community. Thus a better understanding on the underlying factors that leads to recurrence of malnutrition in their community will be of utmost importance to avoid relapse and for developing robust plans for effective post-intervention care in the future.

A03 Bone mineral density, bone mineral content and body composition of 9 to 11-year-old prepubertal Malaysian children – early findings from the PREBONE_Kids study

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During rapid growth, bone mass acquisition is important for peak bone mass attainment and lifelong skeletal health. However, in Malaysia, there is paucity of data for normative values of bone mineral density (BMD) among prepubertal children using dual-energy X-ray absorptiometry (DXA). This study aims to characterise and compare BMD, bone mineral content (BMC) and body composition between boys and girls obtained from baseline data in the effects of prebiotic on bone health in prepubertal children (PREBONE-Kids) study. The parameter measured are total body BMD & BMC, lumbar (L1-L4) BMD & BMC and body composition. The participants were 128 boys and 115 girls aged between 9-11 years old recruited from 3 national primary schools in Kuala Lumpur. Overall, 58.9% have normal BMI-for-age, 8.6% thinness, 15.6% overweight and 8.6% obese. Boys had higher lean body mass than girls (boys: 22.5±5.4kg *vs* girls: 21.0±5.1kg; p=0.025) while girls had higher body fat percentage than boys (girls: 31.1±7.4% *vs* boys: 28.8±9.2%; p=0.033). There are gender differences in total body BMD (boys: 0.780±0.075g/cm^2 *vs* girls:0.754±0.072g/cm^2; p=0.008) and BMC (boys: 1162.4±237.2g *vs* girls: 1096.0±221.4g, p=0.025). Total body BMD aged matched Z-scores ranged between -1.6 to 3.6 and none of the children have low bone mass for their age (BMD *z*-score <-2.0 SD). In conclusion, there is gender difference on the bone mass parameters of prepubertal children and they have normal bone mass for their age. Research funding and support are provided by Tate and Lyle Health & Nutritional Sciences.

A04 Associations between sociodemographic, lifestyle, and psychological factors with abdominal obesity among adult vegetarians

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Waist circumference, as a measure of excess abdominal fat, has been tightly linked to adverse health outcomes inclusive of metabolic diseases. This cross-sectional study aimed to determine the associations between sociodemographic, lifestyle, and psychological factors with abdominal obesity among 273 adult vegetarians (Chinese 54.9%; Indian 45.1%) in Kuala Lumpur and Selangor. A self-administered questionnaire was used to obtain information on sociodemographic characteristics, sleep quality, physical activity level, depression, anxiety, and stress. Mean value of waist circumference was 82.3±11.9 cm, in which two in five of the respondents (42.5%) had abdominal obesity. A higher proportion of Indians (65.0%) were at risk of abdominal obesity as compared to Chinese (25.3%, $p <$ 0.001). Multiple linear regression analysis indicated that depression (β =0.643, p=0.012) and years of vegetarianism (β =0.314, p=0.000) had positive and significant association with waist circumference. Results highlight the importance of abdominal obesity management programs among vegetarians, particularly among Indian vegetarians. Results also suggest that maintaining healthy mental well-being may help to reduce the risk of abdominal obesity among adult vegetarians.

A05 Lean mass is a significant determinant of bone mass in prepubertal children aged 9-11 years old – early findings from the PREBONE-Kids study

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Body composition are important components to determine bone mineral content (BMC) and bone mineral density (BMD). However, which component i.e lean mass (LM) or fat mass (FM) is more important remains a controversial issue in growing children. This study attempts to determine the associations between body composition and bone mass of 243 Malaysian prepubertal children aged 9 to 11 years old obtained from baseline data in the effects of prebiotics on bone health in prepubertal children (PREBONE-Kids) study. Total body and lumbar spine (L1-L4) BMD, BMC and body composition were measured by dual-energy X-ray absorptiometry (DXA). After adjustments for age, gender and height, regression analysis showed that the correlation of body composition with BMC was higher than BMD. Lean mass (LM) exerts the strongest correlation of regression to BMC (r^2=0.863) compared to fat mass (r^2=0.821) d percent body fat (r^2=0.782) in this study population. LM and BMC remains significantly (p<0.001) correlated in obese (r^2=0.757), overweight (r^2=0.862) and normal (r^2=0.775) BMI-for-age children. Children classified as thinness had slightly stronger correlation with percent body fat (r^2=0.838) than LM (r^2=0.824). In conclusion, whilst both LM and FM were correlated with bone status, LM was the stronger predictor even in obesity. The results suggest the importance of increasing lean body mass for bone mass acquisition among prepubertal children during rapid growth. Research funding and support are provided by Tate and Lyle Health & Nutritional Sciences.

A06 Change of health literacy and intervention outcomes among housewives in low cost flats: MyBFF@Home study

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Health Literacy (HL) has been defined as the skills which determine the motivation and ability of individuals to gain, access, understand and use information to promote and maintain good health. Evidence showed that HL is linked to body weight status. The present study aimed to determine the change of HL scores and to investigate the difference of weight loss behavioral change between the HL status among the intervention and control participants. Data of 328 participants from the MyBFF@Home study were used to describe the HL status and sociodemographic characteristics of the control and intervention group. HL was determined using the Newest Vital Sign (NVS) questionnaire. Independent sample t-test was conducted to determine the change of HL (HL improvement and without HL improvement) from baseline until weight loss (WL) intervention phase. Variables included in the analysis were change of anthropometry measurements, body composition measurements, energy intake, and nutrients intake from baseline until weight loss maintenance phase. This study found that both intervention and control participants had low HL. This study revealed that the intervention group increased the NVS mean score from baseline (1.2 scores) to the end of the WL maintenance phase (1.51 scores) compared to the control group .There was no significant difference in sociodemographic characteristics between the intervention and control group except for income. In general, Weight loss behaviors (dietary intake and physical activity) and body composition change did not differ significantly between the group with HL improvement and without HL improvement among control participants. However, change of nutrients intake (intake of calories, carbohydrates, dietary fiber, and calcium) differed significantly between the two HL groups among intervention participants. In conclusion, there was more improvement of HL among intervention participants. In addition, the HL change only influenced dietary intake behavior of intervention participants but not among the control participants.

A07 Associations of nutritional and socio-cultural factors with self-esteem among upper primary school children in Kuala Lumpur

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This cross-sectional study aimed to determine the factors associated with self-esteem among upper primary school children. A total of 272 pairs of children and their parents from four selected primary schools in Kuala Lumpur were involved in this study. Children's body weight and height were measured by the researcher. A set of self-administered questionnaire which assessed body image perception, perceived parenting styles and self-esteem, was completed by children. Their parents were required to complete a set of parent-administered questionnaire, which assessed child eating behaviours. Overall, the prevalence of low self-esteem among the children was 20.6%, with a mean total score of 17.66±3.94. The study found that children who were unaware of their father education background (they came from single family background due to father passed away or divorce) and had father who did not receive any formal education had significantly lower self-esteem when compared to children who had fathers with higher educational levels (F=3.855, p=0.005). The children who perceived themselves as obese (F=2.940, p=0.034) and more dissatisfied with their body parts (r=0.191, p=0.002) had significantly lower self-esteem. Moreover, children with higher satiety (r=-0.126, p=0.038), slower in eating speed (r=-0.138, p=0.023) and more emotional under-eating (r=-0.148, p=0.015) were correlated with having lower the self-esteem. Multiple linear regression analysis showed that children who came from single family background (β=-3.503), had uneducated father (β=-2.810), perceived themselves as obese (β=-3.500), dissatisfied with their body parts (β=0.008), and slow in eating (β=-0.828) were significantly contributed to low self-esteem (R=0.363,

F=8.106, p<0.001). In conclusion, future intervention programs are suggested to emphasize on advocating healthy eating and healthy body weight status in order to improve the self-esteem of the children. Furthermore, the school counsellors are recommended to focus more on the children who came from single family background and had no educated father in improving their self-esteem.

A08 Body composition and somatotypes of male sprinters and hurdlers in Malaysia

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The purpose of this study was to determine the body composition and somatotype of Malaysia male sprinters and hurdlers (N=22) and to investigate the difference in body composition and somatotype between the two groups. All subjects (age = 22±3 years; body mass = 67.9±6.1kg; height = 174.2±4.7cm; BMI = 22.4±1.8kgm^{-2}) undergone skinfold assessment (triceps, subscapular, biceps, supraspinale, abdominal, front thigh and medial calf) to obtain their body composition, sum of seven skinfold sites (∑SK) and body somatotypes according to ISAK protocol. The ∑SK varied from 39.3±9.2mm for sprinters to 46.8±14.5mm for hurdlers. The body fat for sprinters and hurdlers were at an average of 7.0±1.6% and 8.5±2.4% respectively. The mean fat free mass of sprinters was 61.6±5.3kg whilst for hurdlers was 63.8±5.8kg. Sprinters were reported to have an average somatotype of 1.6-4.9-2.7 whilst that of hurdlers were 1.9-5.0-2.7, both characterized by balanced mesomorph. An independent samples t-test and Mann-Whitney U test was conducted to compare the body composition and somatotypes for sprinters and hurdlers. Comparisons of body composition by event revealed that there was no statistically significant difference in terms of the body mass, height, BMI, ∑SK, body fat percentage, fat free mass, skinfold sites and corrected girth for both arm and calf. No significant difference was observed for each of the somatotype components among the two groups. It can be concluded that results of the anthropometric profile showed that the sprinters and hurdlers did not differ much in the aspects of body composition and body somatotype.

A09 The prevalence of BMI status and household food insecurity among primary school children in Kuantan, Pahang

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In Malaysia, the prevalence of childhood obesity is increasing in trend and recently food insecurity was found to be associated with obesity. Therefore, the present study aims to determine the prevalence of household food insecurity and BMI status among primary school children in Kuantan, Pahang. A cross-sectional study was conducted from July 2017 until November 2017 in Kuantan. Twenty primary schools were selected randomly with 797 school children aged between 7 to 11 years old were recruited in this study. There are 367 boys (46.05%) and 430 (53.95%) girls included in the study. The subjects were recruited from six sub districts in Kuantan which included Kuala Kuantan (n=540), Penor (n=20), Beserah (n=49), Ulu Lepar (n=22), Sungai Karang (n=145) and Ulu Kuantan (n=21). The anthropometric data of the children were measured using Rossmax Premium

Digital Weighing Scale with Body Fat Analyzer (WF260) for weight and portable height measurement SECA Stadiometer (Model 213) for height. BMI-for-age (BAZ) z-scores were obtained using AnthroPlus® software. Categories of BMI status were based on World Health Organization (WHO) Child Growth Standard. The household food insecurity was assessed using Radimer/Cornell Hunger and Food Insecurity Instrument and answered by children's caregivers. The results show that the prevalence of normal weight, obese, overweight and thinness/wasting are 64.37% (*n*=513), 15.93% (*n*=127), 12.05% (*n*=96) and 7.65 % (*n*=61), respectively. Meanwhile, for the prevalence of food insecurity, 24.22% (*n*=193) were food secure and 75.78% (*n*=604) were food insecure. For food insecure category, 36.4% (*n*=289) were household food insecure, 5% (*n*=40) were individual food insecure and 34.5% (*n*=275) were in child hunger category. This study showed that there are double burden situation in which both under-nutrition and over-nutrition are coexist and there is a high prevalence of household food insecurity in Kuantan. Therefore, proper intervention should be enforced to address these concerns.

A10 The association between physical activity and nutritional status among female undergraduate students of Universiti Sains Malaysia Health Campus

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The objective of this study was to investigate the association between physical activity and nutritional status among female undergraduates of USM Health Campus. The subject's number of steps and the amount of time spent on moderate-to-vigorous physical activity which was presented as METs for a week was assessed using accelerometers. The nutritional status was assess based on the BMI and body composition of the subjects which includes body fat percentage, total body water, muscle mass, BMR, bone mass and visceral fat rate. A total of 62 female undergraduate students were involved in this study with the mean age of 22.40±0.914 years old. The mean body mass index (BMI) was 21.51±3.14 kg/m^2 which falls in the normal category for BMI. There was a high prevalence of normal BMI with 54.8% followed by overweight with 17.7%. The mean steps taken per day of the subjects were 6933.34±2978.66 steps which falls in the low active category with prevalence of 35.5% while, for METs, the mean was 159.60±98.91 minutes, which falls in inactive category with prevalence of 87.1%. Based on the body composition data collected, the mean body composition of the subjects was in the healthy range accept for the bone mass as it was lower than the recommended level based on the mean body weight of the subjects (52.95±9.49 kg). This study found that there was no statistically significant association (p>0.05) between physical activity both based on steps and time spent on MVPA with nutritional status based on the data collected in this study. There was also no significant difference between body composition components based on PA. Further investigation is required to identify the underlying cause of the not statistically significant association between physical activity and nutritional status among female undergraduate university students.

A11 Association between socio-demographic background, dietary intake and body fat percentage among selected older adults in Selangor

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Limited evidence in Malaysia have investigated relationships between various factors such as socio-demographic, diet quality and objectively measured body fat percentage among older adults. In this study, socio-demographic background including age, sex ethnicity, and smoking activity was assessed using a self-administered questionnaire. Assessment of dietary intake was conducted using face-to-face interview using a Food Frequency Questionnaire (FFQ) adapted from the Malaysian Adults' Nutrition Survey 2014 (MANS 2014) while diet quality was examined using the Malaysian Healthy Eating Index (M-HEI). At risk of poor diet quality is defined as respondent who obtained less than 46 percent of overall score, while respondent who obtained more than 46 percent from overall score is considered low risk of poor diet quality. The score would be given accordingly. Body fat percentage was measured using dual-energy X-ray absorptiometry (DXA). . Excessive body fat percentage defined as more than 25% for men and more than 35% for female Adjusted logistic regression was performed to assess associations between socio-demographic factors, diet quality and body fat percentage. A total of 140 adults (median age: 62.8, IQR= 8.9 years) participated in this study. Chinese was the predominant ethnic group (57.1%), and female was the predominant sex (64.3%). Majority of the respondents (73.6%) were found to be at risk of poor diet quality while a total of 88 participants (62.9%) was found to have an excessive body fat percentage. Results show that female (OR=13.64; 95% CI: 5.04, 36.93) have higher odds of having excessive body fat percentage compared to male after adjusting for potential covariates. Moreover, smokers were four times more likely to have higher body fat percentage compared to non-smokers (OR=4.38; 95% CI: 1.18, 16.20) after adjusting for potential covariates. Meanwhile, our study found that (M-HEI) score of less than 46% (at risk of poor diet quality) (OR=2.87; 95% CI: 1.18, 6.99) shows higher odds of having excessive body fat percentage after adjusting for potential covariates compared to those at low risk of diet quality. Being female, smokers and respondent who are at risk of poor diet quality are more likely to have higher body fat percentage. In conclusion, since the percentage of poor diet quality were high, health practitioner and policy makers should take dietary quality component into consideration for any nutrition related programs intervention.

A12 Relationship between nutrition knowledge and physical fitness among overweight and obese secondary school children

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Physical activity is commonly known as a substantial evidence that indicates it is positively associated with weight loss and long-term weight control, which means insufficient physical activity leads to overweight or obesity. Meanwhile, other studies stated that higher nutrition knowledge leads to a healthier environment. This study aims to study the relationship between nutrition knowledge and physical fitness among overweight and obese secondary school children. A total of 1033 secondary school students participated in this study, and this study is a part of bigger project, MyBFF@school. The participants height and weight were taken and their physical fitness were taken and calculated by using Modified Harvard Step Test formula; (Total duration of exercise / Total post exercise heart rate at minute 0,1 and 2) X 100. The participants' nutrition knowledge were assessed by answering questionnaire provided by MyBFF@school, validated from Prochaska et al, 1997 and Povery et al, 1999. The participants than categorized based on their BMI for age which is overweight, obese and morbid obese. Overall correlation between nutrition knowledge was positively correlation which is 0.020, but the correlation value increased when analyzed based on BMI for age; overweight is -0.052, obese is 0.064 and 0.171 for morbidly obese. However, all the correlation is not significant. From this study, we concluded that nutrition knowledge has positive correlation with physical fitness, but the correlation is fairly weak and not significant.

A13 Changes of weight and body composition parameters at 1 year follow-up after participating 6 months of worksite weight loss program among civil servants in Kota Bharu, Kelantan

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This study was to examine the effectiveness of My Body is Fit and Fabulous at Work (MyBFF@Work) worksite lifestyle intervention by assessing the changes in weight and body composition parameters, physical activity and dietary intake within meal replacement (MR) and portion size (PS) intervention groups across baseline, post-intervention and at 1-year follow-up. Participants were 83 (MR: *n*=37, PS: *n*=46) overweight and obese Malaysian civil servants from 11 government agencies in Kota Bahru, Kelantan with aged 18-59 years old at baseline. Participants in both groups received i) nutrition education, ii) physical activity modification (by participating group dumbbell and aerobic exercise) iii) dietary modification (MR: replacement of non-rice based through fifty 450kcal iso-calorically recipes developed by nutritionist team; PS: reduced portion size of regular food intakes/meals by using

portion plate given) for 6 months. Weight and body composition parameters (BMI, waist circumference and body fat percentage), physical activity and dietary intake were assessed at baseline, post intervention, and 1 year follow up. Based on the data obtained, following a 6 months intervention, in both groups, all mean weight and body composition parameters ($p<0.05$) were significantly decreased, but only mean of IPAQ score in PS showed significant increased during the intervention. Comparing post intervention and at 1 year follow up, in MR, all mean weight and body composition parameters were significantly increased, while in PS, only mean body fat percentage showed significant increased. This might be due to significantly decreased in mean of IPAQ score and significantly increased in mean energy intake in both groups. Comparing baseline and at 1 year follow up, both groups shown no significant different in all mean weight and body composition parameters and IPAQ score but significantly increased in mean energy intake. This indicated that intervention program was not effective in maintaining respondents' weight and body composition parameters at 1 year follow up and the effect of the intervention was not extended to 1 year after the intervention as all the beneficial changes made in weight and body composition parameters, physical activity and dietary intake during intervention were relapsed back to the origin.

A14 Parental perceptions on the motivators and barriers of preschoolers' screen time

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Excessive screen time has been reported to be prevalent among young children, but factors associated with screen time of preschoolers are unclear. The aim of this study is to determine the motivators and barriers associated with screen time among Malaysian preschool children. This study involved 230 Malay, Chinese and Indian children aged 4 to 6 years old from 22 preschools in Kuala Lumpur. Motivators, barriers, screen time and socio-demographic characteristics were proxy-reported by parents through a self-administered questionnaire. Screen time was the sum of time spent watching television/video, using computer/tab or smartphone and playing video games. Screen time was on average 2.94±1.59 hours per day, which was longer during weekend days (3.93±2.47 hours per day) compared to weekdays (2.44±1.55 hours per day). Malay children (3.43±0.18 hours per day) spent more time on the screen than Indian (2.84±0.15 hours per day) and Chinese (2.38±0.18 hours per day) children. Majority of preschoolers (73%) exceeded daily screen time limit of two hours. Parental permission for screen activities was associated with children's screen time (χ^2: 8.21; $p<0.05$). The home environment, for example limited toys to play with, was another factor that encouraged preschoolers to have longer screen time (χ^2: 7.72; $p<0.05$). Parents perceived that children had longer screen time when they were bored (χ^2: 6.24; $p<0.05$). In conclusion, the home environment and parental influence played a role in the amount of time children spent on the screen. Interventions aimed at increasing physical activity participation and decreasing sedentary activities should also consider these screen time related factors.

A15 Factors contributing to bone resorption among postmenopausal Chinese women in Kuala Lumpur and Selangor

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Elevated bone resorption is one of the hallmarks of menopause, which can reduce the bone mineral density of women, and lead to osteoporosis and other bone disorders. Many studies have been focusing on bone mineral density, but there were limited studies focusing on the intermediate process, such as bone resorption. This study determines the factors that contribute to bone resorption among postmenopausal Chinese women. A total of 214 postmenopausal Chinese women from seven senior citizens clubs in Kuala Lumpur and Selangor were participated in the present study. Body weight and height of the subjects were measured, and their body mass index were calculated. The subjects were interviewed by the researchers regarding their physical activity, sun exposure and dietary intake. Blood samples of the subjects were collected for serum 25(OH)D and serum collagen type 1 cross-linked C-telopeptide (CTx-1) analysis. The results showed nearly two out of five of the subjects (38.8%) were overweight and obese. About half of the subjects (58.9%) were moderately active, and they had a median sun exposure of 180.0 (60.0, 300.0) minutes per week. The subjects had an average dietary calcium intake of 618.9±279.3 mg per day, which is lower than the daily recommendation for calcium intake. Majority of the subjects (49.5%) had inadequate serum 25(OH)D level followed by deficiency (33.2%), and only 17.3% of them had adequate serum 25(OH)D level. The mean serum CTx-1 level of the subjects was 0.5±0.2 ng/ml. In the multiple regression, younger age (B=-0.006) and moderately active (B=0.065) contributed to higher bone resorption (R^2=5.9%, F=6.632, p<0.01). Higher bone resorption may not lead to the elevated bone turnover as bone formation needs to be accounted for. Future studies are recommended to have longitudinal study design and inclusion of bone formation marker to determine the net changes of bone turnover.

A16 Attitude and limiting factor of breastfeeding among working mother in Universiti Kebangsaan Malaysia (UKM), Bangi campus

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The prevalence of breastfeeding, especially exclusive breastfeeding in Malaysia is still low despite numerous benefits of breastfeeding has long been known. This study was conducted to assess the attitude of breastfeeding among employed mothers in Universiti Kebangsaan Malaysia (UKM). Also, to determine the relationship between breastfeeding attitude and sociodemographic factors and identify the main factors that limit breastfeeding. A total of 150 women experienced in breastfeeding between the ages of 20-50 years who worked at UKM Bangi were randomly selected as respondents. Questionnaires were used to obtain information about the respondent's background and attitude of breastfeeding as well as limiting factors. 13 questions of breastfeeding attitude using 5-point Likert scale had been validated on 30 working mothers in UKM and the *Cronbach Alpha* value was 0.77. The mean score on attitude of breastfeeding was 80.7±9.4%. Thus, the level of respondents's attitude of breastfeeding was in a good category. A total of 95.4% respondents agreed on "community should encourage mothers to breastfeed" statement. Besides, they believed on statement "workplace should provide a special space for breastfeeding" (92.7%) and "breastfeeding did

not negatively impact on marriage" (92.6%). However, only 54% of respondents disagreed on "formula milk is a better choice if mothers intend to resume working after maternity leave" statement. In addition, there was a significant negative correlation between attitude of breastfeeding (r=-0.263, p<0.01) with the age of the respondents but not with income and educational level. The main factors that limit breastfeeding in this study were the short period of maternity leave followed by the lack of facilities in the workplace. Therefore, the breastfeeding promotion should be intensified to increase awareness on breastfeeding. Employed mother should fully use the maternity leave given by government to practice exclusive breastfeeding and try to continue it using breastfeeding pump at the workplace.

A17 Correlation between waist-hip circumference ratio and body mass index with blood glucose level

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In Indonesia, prevalence of diabetes melitus has increased 2 fold from 2007-2013 years. The increasing incidence of type 2 diabetes mellitus is associated with the increasing prevalence of overweight and obesity. Insulin resistance that occurs in the obese group can lead to a decrease in insulin work that causes increased glucose levels. Body Mass Index (BMI) and Waist to Hip Ratio (WHR) are body antropometric measurments alternative for predicting obesity. The purpose of the study was to study the relationship between waist circumference ratio and body mass index with blood sugar level. The study design was cross-sectional. The study population was elderly *posyandu* members aged 45 to 70 years in Kalijidan public health center work area who were registered in elderly *posyandu* activities in December 2017. There were 36 respondents who were drawn by simple random sampling method. The variables of this study were the characteristics of respondents, body mass index, waist-hip ratio and fasting blood glucose level. The study showed that respondents classified as obesity based on body mass index (27,8%), abdominal obesity based on waist hip ratio (63,9 %) and blood glucose level more than 125 mg/dl (25%). The result of pearson correlation test showed that there was relationship between waist-hip ratio with blood glucose levels which was statistically significant p<0.05 (p =0.003; r=0.486). There was no relationship between mass index with blood glucose level which was not statistically significant p>0.05 (p=0.316; r=0.172). It is concluded that waist-hip ratio measurement should be done in elderly *posyandu* activities to detect people with high risk diabetes.

A18 Socio-demographic factors associated with duration of exclusive breastfeeding among mothers of infants aged under 6-24 months in Petaling district, Selangor

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Breastfeeding practice is frequent practiced by mothers in Malaysia. However, the duration of exclusive breastfeeding (EBF) as recommended by World Health Organisation (WHO) are common problems among mothers of infants aged under six months until two years.

This cross sectional study aimed to associate socio-demographic factors and duration of EBF practice among mothers in Petaling district. A total of 170 mothers of infants with average age of 10 months were recruited through purposive sampling approach in Petaling district, between February and April 2017. A set of supervised self-completed questionnaire on EBF and mother's socio-demographic factors were used to collect the required data. Results showed that only 55.9% of mother breastfeed their children exclusively till 6 months, meanwhile 44.1% were not. A chi-square test was performed and the relationship were found between employment status, X^2 (9, N=170) = 22.29, p= 0.08; ethnicity, X^2 (9, N=170) = 6.50, p=0.05 and parity, X^2 (9, N=170) = 18.20, p=0.033 with duration of exclusive breastfeeding (EBF) practice. An independent t-test were used to analyse the growth status of infants according to breastfeeding practice. There were significant differences in the length of infants within 6 months (M=60.52, SD=1.41), conditions t(58)=11.89, p=0.003 and weight of infants within 6 months (M=7.00, SD=0.51), conditions t(58)=12.44, p=0.003 with duration of EBF practice. In conclusion, the socio-demographic factors were associated with duration of exclusive breastfeeding (EBF) practice. Future research should be conducted to further explore the socioeconomic factors contribution towards breastfeeding practice and growth status of infants and young children in Malaysia.

A19 *Ceria, Respek, Gigih, Aktif, Sihat* (C.E.R.G.A.S.): Assessing the sustained impact of a school-based obesity intervention programme

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With increasing childhood obesity rates in Malaysia, school-based obesity prevention programmes are important; and when implemented sustainability should be seriously considered. This study aimed to assess the sustained impact of C.E.R.G.A.S. programme on anthropometric status, knowledge, attitude and practice (KAP) for physical activity (PA) and nutrition of secondary school students. Participants (n=52) were followed-up at 16 months after completion of programme. Participants attended a residential camp where proper exercise techniques were learnt and thereafter underwent twice weekly exercise sessions over a 12-week period. Anthropometric outcomes, including body mass index (BMI), body fat percentage (BF%) and waist circumference (WC); and KAP towards nutrition and PA was administered at baseline [P0], 3rd [P1], 6th [P2] and 16th month [P3] post-intervention. Repeated-measures analysis of covariance (ANCOVA) with intention-to-treat principle were applied. At 16 months after completion of programme, significant differences were found in BMI-for-age Z-score (P0:2.51±0.89 vs P3:2.16±0.88, p<0.05; 95%CI:2.04,2.49), BF% (P0:41.8±8.0 vs P3:36.8±7.6, p<0.001; 95%CI:37.3,41.3), knowledge (P0:9.4±1.3 vs P3:14.2±1.6, p<0.001; 95%CI:12.9,13.3), attitude (P0:28.0±4.6 vs P3:41.2±6.8, p<0.001; 95%CI:32.0,33.6), practice (P1:28.0±4.5 vs P3:41.4±7.7, p<0.001; 95%CI:31.7,33.3) scores for nutrition; and knowledge (P0:9.5±1.3 vs P3:12.8±2.6, p<0.001; 95%CI:12.4,12.9), attitude (P0:27.7±4.5 vs P3:42.6±6.5, p<0.001; 95%CI:32.3,34.0), and practice (P0:27.7±4.1 vs P3:33.8±4.5, p<0.001; 95%CI:29.8,31.1) scores for PA. Overall, this study demonstrated that the effect of C.E.R.G.A.S. intervention on BMI-for-age Z-score, BF%, KAP scores for nutrition and PA, but not WC, was successfully sustained over a period of more than a year after completion of programme. With sustained positive outcomes, the C.E.R.G.A.S. programme can potentially be adopted and implemented at other secondary schools in Malaysia to combat obesity.

A20 Associations between socio-demographic characteristics, medical history, obstetrical history and newborn birth weight among mothers in Kuala Lumpur and Selangor

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The present study aimed to examine the associations between socio-demographic characteristics, medical and obstetrical history and birth weight among mothers in Kuala Lumpur and Selangor. While this study is part of the Maternal and Infant Cohort Study (MICOS), a total of 277 pregnant women, with a mean age of 29.56±4.33 years, had completed the current phase of the MICOS. The participants were interviewed using a structured questionnaire during their third trimester of pregnancy and 1-month after childbirth. They were interviewed regarding their socio-demographic background, medical and obstetrical history by trained researchers and information gained was cross-checked with their pregnancy medical book record. Pre-pregnancy body weight and height were obtained from the maternal medical book record to calculate the pre-pregnancy body mass index (BMI). Information on newborn birth weight was obtained from the infant medical book record during newborn aged 1-month old. The results showed that the mean birth weight of newborn was 3.01±0.44 kg, with 9.7% of the newborn delivered with less than 2500g. Mother's educational level, household income, medical complications during pregnancy, mother pre-pregnancy weight and gestational weight gain were significantly associated with birth weight (p<0.05). Multiple linear regression analysis showed that 33.7% of variances in newborn birth weight were accounted by mother's educational level (β=0.104), hypertension during pregnancy (β=-0.427), mother's pre-pregnancy weight (β=0.510) and gestational weight gain (β=0.310), (F=49.168 p<0.05). In conclusion, one in ten newborn delivered with low birth weight. The study found that mother with low educational level, diagnosed with hypertension during pregnancy, low pre-pregnancy weight and insufficient gestational weight gain during pregnancy were associated with low birth weight. Hence, early health intervention should start as early as before pregnancy and throughout the pregnancy for healthier birth weight of infants; thereby promoting public health and eradicating health inequalities across the next generations.

A21 Household food insecurity and nutritional status among adolescents in Kuantan, Pahang

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The link between food insecurity and nutritional status has been studied comprehensively, but the results were mixed depending on the data source and subpopulation involved. The objective of this study is to investigate the prevalence of household food insecurity

and nutritional status among secondary school children in Kuantan, Pahang. Data were obtained from 530 students from 12 secondary schools in five different sub-districts in Kuantan, Pahang. Food security parameters were measured using validated Radimer/ Cornell Hunger and Food Security Instrument (Malay version). The weight and height were measured and height for age and BMI for age were calculated using WHO Anthroplus® software. 76.4% of the students were living in food insecurity while the other 23.6% were food secure. From food insecurity category, 31.5% of them were sub-categorized into household food insecure, 7.5% of them were experiencing food insecurity in individual level (mother or father) and 37.5% of them were in child hunger category. Out of 5 sub-districts, Ulu Kuantan had the highest food insecure to food secure households' ratio (5:1) compared to other sub-districts. According to WHO cut-off point, 16.6% and 14.2% of the subjects were overweight and obese respectively, 9.3% of them fell into underweight category and others were normal. 26.5% of the underweight students were severely wasted and 47.5% of students were stunted. The prevalence of overweight and obese were higher in female subjects and food insecure households (58.7% and 77.3% respectively) compared to male and food secure households (41.7% and 22.7% respectively). This study showed that the food insecurity is present in Malaysian households and the prevalence of overweight and obesity is high among adolescents in Kuantan. More synchronize actions from both government and non-governmental agencies are necessary to overcome these problems.

A22 Factors associated with gestational weight gain among pregnant women in Sepang, Selangor

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Obesity among women of childbearing age is very predominant and has raised a serious public health concern. Institute of Medicine (IOM) has developed a guideline on recommended pregnancy weight gain. The focus is on meeting, not exceeding the weight goals in order to avoid any pregnancy complications. This cross-sectional study aimed to determine the associations between socio-demographic characteristics, maternal status, food groups frequency and nutritional knowledge level with gestational weight gain (GWG) among pregnant women. A set of self-administered questionnaire consisting socio-demographic characteristics (age, educational level, occupation and monthly household income), maternal status (pre-pregnancy BMI and parity), food groups frequency and nutritional knowledge level were completed by the respondents. Height and body weight were assessed by the researchers. A total of 115 pregnant women who attended prenatal check-up at selected governmental health clinic in Sepang, Selangor, participated in this study. All respondents were in final trimester with the mean age of 30.40±3.77 years. Results showed that 49.6% of the respondents were gaining less than IOM 2009 Guideline and 20.9% gained excessively. Pre-pregnancy BMI was significantly associated with GWG ($p<0.01$). Mothers who entered pregnancy with underweight and normal weight were found to gain inadequately while overweight and obese mothers tend to gain more than recommended. None of the socio-demographic characteristics, food groups frequency and nutritional knowledge were correlated with GWG. In conclusion, there is a need to encourage all pregnant women to achieve healthy GWG as it is a modifiable factor that can be controlled.

A23 Nutrition labelling: An exploratory study on personal factors that influence knowledge and perception on nutrition labels among adolescents

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Trend of processed food intake are increasing among adolescents in developing countries. To control excessive consumption of processed foods, consumers are recommended to read nutrition labels, which describe the nutrient content of a food and meant to guide consumers on food selection. However, evidences suggest that usage of nutrition labels is generally low among adolescents. The aim of this qualitative study was to explore factors that influence adolescents' knowledge and perception of nutrition information provided on labels. Five semi-structured focus group discussions (FGD) were conducted in this study. The participants consisted of adolescents aged between 13 to 16 years from 5 public secondary schools in Negeri Sembilan. The participants discussed their knowledge, perceptions, and use of nutrition labels and food selections during the FGD. Data gathered from FGD were coded through thematic analysis using NVivo version 11 software. Results showed that participants were familiar about nutrition labels. However, use of nutrition labels among participants was relatively low during food selections, as lack of interest on nutrition information provided on labels, past experiences, hungry and food cravings, time constraint, and taste of food. On the other hand, main reasons for using nutrition labels among adolescents were concern on specific nutrition information provided on labels and health conscious. Majority of the participants believed that information provided on the labels were accurate because it was approved by reliable institution. Some of the participants reported that nutrition labels, an expiry date and list of ingredients on the labels were confusing. While a few of them reported unconvinced with the labels and indicated misleading information. In conclusions, this study proved that nutrition labelling can be one of important elements in nutrition education to solve nutrition problems, specifically in obesity prevention.

A24 Factors affecting induced lactation practice: applying a conceptual framework

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Research on breastfeeding an adopted child has begun to be documented since the mid-20th century with keywords such as "non-puerperal lactation", "breastfeeding without pregnancy", "breastfeeding adopted children", "wet nursing" and "induced lactation". Induced lactation is defined as the process by which milk or breast milk is caused to be produced in a mammal (woman), without the benefit of recent pregnancy and/or birth, and may include the use of herbs, supplements, medications, mechanical/manual stimulation, and/or the offspring or infant, to bring in the milk or breast milk supply. In this poster, we propose a conceptual framework of the factors that contributing to the induced lactation

practice in Malaysia. The understanding of the conceptual framework is important to guide this research design, research objectives and research questions, as well as data analysis. Exploring induced lactation practice, factors associated and outcomes of this study can be conceptualized from Theory of Attachment (Bowlby and Ainsworth, 1950), Social Cognitive Theory (Bandura, 1986), Theory of Reasoned Action (Ajzen and Fishbein, 1980) and Theory of Optimal Matching (Cutrona and Russell, 1990). In line with the four theories, the experiences of induced lactation women are influenced by psychosocial factor, biophysical factor and socio-demographic factor. Meanwhile the practice of the practitioners involves in method of inducing lactation, breastfeeding management, medication and herbs, lactation aids and also the workplace setting of the individual practitioner play a role in determining the regime that will be prescribed to the individual adoptive mother. For the support person on induced lactation's perception, it involves emotional support that is the expression of empathy, caring, and concern toward the person; appraisal support is a positive regard for the person, encouragement and agreement with the individual's ideas or feelings; instrumental support is direct assistance of a practical nature; informational support is giving advice, directions, suggestions, or feedback about how the person is doing. In conclusion, this framework is intended for use in planning and organizing future research and in designing and evaluating interventions to promote recommended induced lactation practices in Malaysia.

A25 Association between socio-demographics, social media exposure, sleeping pattern and physical activity level with body weight status among students in faculty of medicine and health sciences, Universiti Putra Malaysia

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University students are important target for healthy lifestyle intervention considering the alarming rate of obesity among young adults. Therefore, this cross-sectional study was aimed to determine the body weight status of students in Faculty of Medicine and Health Sciences, UPM and its associations with socio demographic characteristics, social media exposure, sleeping pattern and physical activity level. A total of 203 students were recruited using convenience sampling method. Weight, height, waist circumference and body fat percentage were measured. A set of self-administered questionnaires consists of demographic information, social media exposure, The Pittsburgh Sleep Quality Index (PSQI) and Global Physical Activity Questionnaire (GPAQ) were used to determine all the independent variables. Age ranges of respondents were between 19-25 years old. Majority of the respondents were female (75.9%), Malay (82.3%), reported no addiction to social media (78.8%), had insufficient total hours sleep at night (62.3%), experienced poor sleep quality (69.8%), performed moderate physical activity level (40.5%), presented with normal waist circumference (79.3%), and medium body fat percentage (64%). Mean frequency and duration of social media use, sleep duration and physical activity were 6.16±3.56, 2.85±2.12, 5.61±0.80 hours, 2137.58±2007.23 METs min/week, respectively. The proportion of overweight and obesity was 25.6% and 11.8% respectively. There was significant differences in terms of sleep quality between normal *vs* overweight-obese respondents (t=-2.12, p=0.035). Duration of social media usage and sleep quality showed significant association with body weight status [(r=-0.167, p=0.019) and (r=0.186, p=0.08) respectively]. In conclusion, the proportion of students in Faculty of Medicine and Health Sciences, UPM who were overweight and obese are in tandem with national average. The body weight status was found to be associated with duration of social media usage and sleep quality.

A26 Determination of dietary practices associated with hydration status of state junior male athletes in Kelantan

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Limited data concerning association of dietary practices towards hydration levels in state junior male athletes exists. The purpose of this study is to determine the association of dietary practice with hydration status among state junior male athletes by comparing indoor and outdoor sports. Twenty-five junior athletes from badminton and hockey participated in the study (age: 15.3±1.0y). Water content derived from solid and fluid foods was recorded from the semi-quantitative food frequency questionnaire to record the dietary pattern during training day. For indoor, approximately 20.5% of water intake comes from foods and 79.5% from drinking water and beverages and outdoor shows 32.9% and 67.1%, respectively. The mean of total water content derived from solid food and beverages of indoor athletes (12.1±4.2L) higher than outdoor (9.6±5.9L). Data collection for athletes of the same sports took place at the same time of the day with mean environmental temperature and humidity of outdoor venue is higher compared to indoor and trained for approximately 3 hours and they were consuming fluids ad libitum during practice. Over 64 % of the athletes were significantly dehydrated (USG > 1.020 mg/dl) based on first morning urine sample and increased by 72 % of athletes experienced hypohydration at the end of the training day. Mean body weight loss during training was -1.0±0.87 %. Sweat rate loss of indoor showed higher value compare to the outdoor during training sessions. Hand grip strength test of indoor athletes is lower in compare to outdoor. We concluded that the prevalence of hypohydration among state junior male athletes is very high, as indicated by USG, body weight changes and sweat rate loss and significantly difference between indoor and outdoor. However, there is no significant association between dietary practices and hydration status of athletes.

A27 Factors correlated with body weight status using Asian cut-off points among undergraduate university students in Universiti Putra Malaysia

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The prevalence of obesity is increasing at an alarming rate in many parts of the world, including Malaysia. Based on national prevalence in 2015, about 43.1 % of adults aged 18 to 24 years are overweight and obesity. Meanwhile, based on previous studies, the prevalence of overweight and obesity among university students ranges from 30.0 to 35.9 %, which is comparable to the national data. University students are vulnerable of being overweight and obesity as they tend to engage in unhealthy lifestyle. Thus, this study aims to determine the factors correlated with body weight status using Asian cut-off points among undergraduate university students. A total of 235 university students in UPM were recruited in this study. Data collection was conducted from February to March 2018. The respondents completed a set of questionnaire consisting of several items, including sociodemographic background, academic background, nutritional status, physical activity level and psychological distresses. Blood pressure and anthropometric measurements were measured too. As a result, about 46.0 % of the respondents were categorizes as having normal body weight, followed by overweight (25.5 %), underweight (15.3 %) and obese (13.2 %). By using Pearson correlation and Chi-square test, the factors that correlated with body

weight status include waist circumference (r = 0.885, p <0.001), systolic blood pressure (r = 0.341, p <0.001), diastolic blood pressure, total physical activity (r = 0.391, p <0.001) and depression (r = -0.130, p = 0.046). Meanwhile, there was no significant association was found between both sociodemographic and academic background with body weight status. In conclusion, future intervention programs focusing more on lifestyle related issues need to be taken into consideration to promote healthy lifestyle among university students to combat with these health problems like overweight and obesity.

A28 Association between socio-demographic factors and diet quality with bone mineral density among adults aged 50 to 90 years old in Klang Valley

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Diet is an imperative modifiable factor that is associated with bone health. However, there are limited number of studies that have assessed relationships between diet pattern and bone mineral density (BMD) in Malaysia. The objective of this cross-sectional study was to examine the association between socio-demographic factors and diet quality with BMD among free living adults aged 50 to 90 years old in Klang Valley. Information on socio-demographic characteristics (age, sex, ethnic) were attained using a self-administered questionnaire. Assessment of dietary intake was conducted via face-to-face interviews using a Food Frequency Questionnaire (FFQ) adapted from the Malaysian Adults' Nutrition Survey 2014 (MANS 2014) while diet quality was examined using the Malaysian Healthy Eating Index (M-HEI). BMD was measured using dual-energy X-ray absorptiometry (DXA). Adjusted logistic regression was performed to assess the associations between socio-demographic factors, and diet quality with BMD. A total of 140 adults (Median age: 62.8, IQR= 8.9 years) participated in this study. Chinese was the predominant ethnic group (57.1%), and female was the predominant sex (64.3%). 73.6% of the respondents were found to be at risk of poor diet quality (M-HEI composite score: ≤46%). A total of 98 participants (70%) was found to have low BMD (t-score of <-1.0). Surprisingly, no significant association was found between age, sex, ethnic, and M-HEI category with BMD among the respondents. Although M-HEI can measure the adherence towards Malaysian Dietary Guidelines 2010, it was found to be incompatible as a measure of healthy eating for optimal bone health. Hence, further research is needed to develop a disease-specific diet score for that purpose and prospectively helps to improve bone health among Malaysians, specifically the adult population.

A29 Socioeconomic and demographic factors associated with complementary feeding practices and body weight status of children in Petaling District, Selangor

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Inappropriate complementary feeding practices such as: untimely introduction of complementary food, improper feeding frequency, and low dietary diversity of complementary foods have been widely shown to increase the risk of underweight and stunting. Several studies have documented the impact of cultural factors, maternal age, marital status, family income/social class, mode of delivery, time of initiation of first breastfeeding and proximity to babies on feeding pattern on weight status. Hence, this cross sectional study attempted to investigate the relationship between socioeconomic and demographic factors of mothers with complementary feeding practices and body weight status of children in Petaling District, Selangor. Subjects comprised of 141 participants (n=141) who are the mothers of children aged 6-24 months recruited through purposive sampling approach. Self-administered questionnaires were distributed among participants comprising of socioeconomic and demographic characteristics of mothers and children, maternal nutritional knowledge, breastfeeding practice and complementary feeding practice. The height/length and weight of the children were measured to determine BMI-for-age z scores using standardized methodology. Data analysis was done using Statistical Package for the Social Sciences version 23 for detailed interpretation. There were 46.8% male and 53.2% female children respectively with mean age of 15.27±6.11 months. Average BAZ was 0.167±0.80 with 75.9%, 15.6 % and 8.5% in normal, overweight and wasted category, respectively. Results showed significant association between maternal age (r_s=0.026), educational status (r_s=0.033), occupational status (r_s=0.017) and household income (r_s =0.023) with complementary feeding practices ($p<0.05$), but not on maternal race (r_s= 0.324) and nutrition knowledge (r_s=0.651). No significant association was found between complementary feeding practices with body weight status of the children (r_s= 0.730, $p>0.05$). This study highlights on factors that were associated with complementary feeding practices. Other possible factors should be explored in future to ensure better complementary feeding practices among mothers.

A30 Creating a healthier nutrition environment in secondary schools (NuTeen): rationale, design and baseline findings

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School serves as an important institution to influence students' food choice behaviors and to develop healthy dietary habits. This is because they have more contact hours in school than any other places. This randomized controlled trial intervention aims to reduce the proportion of high energy dense foods and drinks sold in the school canteens, to improve students' food choice behavior and the overall dietary intake as well as to improve students', parents', teachers' and canteen operators' nutritional knowledge, attitudes and practices. The NuTeen intervention was designed to develop a healthy school canteen model for secondary schools in Kuala Lumpur and further to be accredited as *Kafeteria Sihat* by the Nutrition Division of the Ministry of Health, Malaysia. This is the first attempt among Malaysian Secondary School canteens to obtain such recognition. This 8 weeks intervention had used both quantitative and qualitative approaches to assess the change in nutritional knowledge, attitude and practice of students, parents, teachers and canteen operators. In addition, students were assessed on their eating patterns in the schools canteen, overall dietary intake, and nutritional status before and after the intervention. A total of 924 students, 522 parents, 254 teachers and 20 canteen operators were recruited during baseline. The overall prevalence of overweight and obese was 18.6% and 13.5% respectively. About 48% of them eat 2-5 times per week in the school canteen and 55.5% do not bring any snack or lunch box to school. Majority of the students (59.4%) think that there are lack of healthy food choices in school canteen and 47.9% think the food sold is

expensive. The proportion of teachers and canteen operators with good nutrition knowledge was 31.1% and 30% respectively. The results of baseline data showed that there is an urgent need for an intervention to be done.

A31 Associations of socio-demographic, maternal and neonatal factors with neonatal weight gain at 3-month old at selected health clinics in Rompin, Pahang

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Body weight is an important indicator of infant growth and development. However, data pertaining to neonatal weight gain among Malaysian mother is scarce. Therefore, this cross-sectional study aimed to determine the neonatal weight gain at 3-month old and its associations with socio-demographic, maternal and neonatal factors. A total of 98 mothers were participated in this study. Data from the maternal and neonatal factors were obtained from the Pregnant and Infant Health Record Books. The mothers were interviewed about the feeding practices. Most of the mothers were Malay (86.9%), married (100.0%) and did not have any complication during delivery (75.5%). As for the pre-pregnancy body mass index (BMI), more than half were overweight and obese (52.2%), and about half (49.0%) were classified as below the recommended gestational weight gain (GWG). Most of the infants (90.8%) had birth weight within normal range. As for the infants' feeding practices, a majority of the mothers had practiced early initiation of breastfeeding (94.9%) and exclusive breastfeeding their infants under 3 months (98.0%). Most of the infants had optimal weight gain (49.0%), with the highest mean of neonatal weight gain was during second months of life (0.99±0.34kg). There were no significant differences in household income (t=1.469, p=0.235), complication during delivery (t=-0.206, p=0.837), early initiation of breastfeeding (t=0.232, p=0.817) and exclusively breastfed under 3 months (t=0.890, p=0.376) with neonatal weight gain. Boys showed a significant higher weight gain than girls (t=2.693, p=0.008). Maternal age (r=-0.062, p=0.542), GWG (r=-0.095, p = 0.350), pre-pregnancy BMI (r=0.130, p=0.201) and birth weight (r=-0.040, p=0.692) were not correlated with neonatal weight gain. In conclusion, about half of the infants did not achieve the optimal weight gain (51.0%). Being boy was associated with infants weight gain. Further study is needed to explore the biological influences of sex on neonatal weight gain.

A32 Nutrition education for Rohingya students in Kuala Lumpur: a pilot study

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The Rohingya refugees reside in Malaysia to escape war and discrimination back in Myanmar, since 1980. Presently, refugees' health in Malaysia have become more deteriorated with higher prevalence of chronic diseases; at the same time, preventive health efforts are still lacking. This study aimed to assess the current nutritional status and the effect of a 12-week nutrition education program on nutrition knowledge, attitude and practices of Rohingya adolescent students. A total of 30 Rohingya adolescent students (aged 10-

16 years old) from two Rohingya learning centers in Kuala Lumpur, received a nutrition education. The syllabus focused on introducing the benefits attributed to normal growth through healthy dietary intake, consequences of unhealthy dietary habits and food portion sizes. A questionnaire survey was distributed to evaluate the changes in their nutrition knowledge, attitude and practices at the pre- and post-program. More than half (56.7%) of the subjects have normal height-for-age while 43.3% of them are stunted, based on WHO Growth Reference for 5 to 19 years old. The nutritional assessment also indicated that majority (80%) of the Rohingya students were of normal BMI-for-age, 7% underweight and 13% overweight or obese. A significant increment (p<0.05) was observed in the post-program's nutrition knowledge mean score (15.30±3.29), compared to pre-program nutritional knowledge score (13.77±4.06). However, no significant increments observed on nutrition attitude and practices pre- and post-program. The nutrition education program has been shown to improve the Rohingya adolescent students' nutritional knowledge. Future nutrition education programs with interactive components and longer period of time are recommended, as well as the inclusion of other influencing factors such as parental education and schools' environments are necessary to ensure improvements on refugee students' nutrition attitude and practices.

A33 Relationship between physical activity and early childhood development among children aged 1 to 3 years in Klang Valley

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Physical activity plays an important role in childhood development and has been associated with increased cognitive performance, motor skills and improved psychosocial indicators. However, not many studies have explored this association among young children. Therefore, this study aims to explore the relationship between objectively-measured physical activity and early developmental milestones among children aged 1 to 3 years old. This cross-sectional study involved 38 toddlers who attended childcare centres in Klang Valley and completed all the study protocol. Physical activity was measured using Actigraph GT3X+ accelerometer. Childhood developmental milestones including communication, gross motor, fine motor, problem solving and personal social skills were measured using Ages and Stages Questionnaires (ASQ-3). This study found that on average, toddlers engaged in 489.2 minutes (75% wear time) of sedentary activities; 98.6 minutes (15.2% wear time) light physical activity and 63.8 minutes (9.8% wear time) moderate-to-vigorous physical activity (MVPA). Toddlers were more active on weekend days compared to weekdays as indicated by significant difference in light physical activity (106.5±28.5; 92.5±25.7, p<0.01) and total physical activity (171.6±49.4; 154.5±43.2, p<0.05). Boys were more active than girls as evidenced by significant difference in MVPA time (71.8±23.2; 57.4±18.8, p<0.05). Almost all (97.4%) toddlers achieved 90 minutes of daily physical activity as recommended in Malaysian Dietary Guidelines 2010 however only 32% achieved international guidelines of 180 minutes of daily physical activity for toddlers. Total physical activity was positively correlated with communication skills (r=0.322, p<0.05) and fine motor skills (r=0.330, p<0.05) but not with gross motor, problem solving and personal social skills. In conclusion, this study found association between physical activity participation with certain childhood developmental domains. We opine that future studies in this area will contribute to a deeper understanding of the relationship between physical activity and childhood development among toddlers.

A34 Physical activity level and its related factors among primary school children in Kuala Lumpur

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Childhood obesity is a serious public health concern and physical inactivity may be one of its main contributors. The aim of this study was to determine the relationship between family influence, community and built environment factors with physical activity of children in Kuala Lumpur. A total of 175 children aged 7 to 12 years were recruited from primary schools located in three zones of Kuala Lumpur, namely Bangsar/Pudu, Sentul and Keramat. The questionnaire was prepared in Malay and was answered by the children with guidance provided by researchers when needed. This questionnaire consists of four sections, namely overall physical activity, student's opinion about physical activity, family and peer influence, and community and built environment, and requires typical week physical activity recall. Only 37.7% of children were physically active for at least 60 minutes per day on five or more days in a week. Boys were significantly more active than girls (p<0.05). This study also showed that 69.1% children (71.1% boys; 66.7% girls) exceeded the limit of two hours of daily screen time. The two significant family factors reported were parental encouragement to do physical activity (p<0.05) and purchase of sports equipment for their children (p<0.05). There is no significant association between community and built environment factors with physical activity level. However, more than half the subjects (65.4%) thinks that it is safe for them to play outdoors in their neighbourhood at anytime. In conclusion, this study highlighted that primary school children in Kuala Lumpur has low level of physical activity with high level of screen time. We opine that further investigation is needed for a deeper understanding of physical activity behaviour of Malaysian school children and their barriers and motivation towards physical activity.

A35 Food security status affects stress level and academic performance among university students

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University students are vulnerable to experience food insecurity. This is due to their economic wellbeing in which their limited funds are not only for buying food, but also to pay for fees and other living expenses. Food expenditure is among the expenses that will be affected and reduced in order to survive at the university. Unfortunately, this situation results in food insecurity and subsequent consequences. A cross sectional study was conducted among students from Kulliyyah of Allied Health Sciences (KAHS) of IIUM Kuantan to assess the food security status and stress level among the population. Two hundred students were recruited as the participants in the study. The survey was conducted using the self-administered questionnaire containing Food Insecurity Experienced Scale (FIES) and DASS 21 items. As food insecurity amplifies many nutritional, health and development impacts, this study also aimed to highlight any association of food insecurity with stress level and academic performance. Overall, 74.5% of KAHS students surveyed were food insecure. The study discovered a significant association between food insecurity and stress level (r=0.248, p<0.001). Besides, a negative association between food insecurity and academic

performance was also revealed (r= -0.165, p=0.02). As a conclusion, food insecurity among university students may contribute to poor stress level and reduced academic performance. Actions need to be taken to improve the food security status to help the students to further excel in their studies.

A36 Nutritional attitude: association with emotional and behavioral problems among overweight and obese secondary school students of MyBFF@school program

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Little is known about the association of nutritional attitude with emotional and behavioral problems. The aim of this study was to determine the association of nutritional attitude with emotional and behavioral problems among overweight and obese secondary school students of 'My Body is Fit and Fabulous' at school (MyBFF@school) obesity intervention program. This was a school-based cluster randomised controlled trial where 1041 students (mean age of 14.61±1.324SD years old) from 15 secondary schools in Kuala Lumpur, Selangor and Negeri Sembilan with BMI-for-age of more than +1SD participated in the MyBFF@school program. The nutritional attitude was assessed using a validated nutrition questionnaire while the emotional and behavioral problems of the students were assessed using the Youth Self-Report questionnaire. Spearman's rank-order correlation was run to determine the relationship between nutritional attitude and the emotional and behavioral problems. There were weak, statistically significant negative correlations between nutritional attitude and: anxiety (r_s(621) = -.238, p<.001); depression (r_s(627) = -.249, p<.001); somatic complaints (r_s(620) = -.176, p<.001); social problems (r_s(625) = -.203, p<.001); thought problems (r_s(621) = -.154, p<.001); attention problems (r_s(622) = -.285, p<.001); rulebreaking behavior (r_s(625) = -.173, p<.001); aggressive behavior (r_s(616) = -.223, p<.001); and other problems (r_s(583) = -.285, p<.001). Even though there is no evidence of a causal relationship between nutritional attitude and the emotional and behavioral problems from the results of this study, the weak associations between them suggest that nutrition education intervention program is imperative in increasing the success of reducing emotional and behavioral problems among overweight and obese secondary school students.

A37 Internet addiction and physical activity among health campus students, Universiti Sains Malaysia

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The goals of this study were to test the reliability of IAT questionnaire, measure internet addiction level and physical activity level, and lastly to investigate relationship between internet addiction and physical activity among health campus students at Universiti Sains

Malaysia (USMKK). Convenience sampling method was applied and 218 undergraduate students from USMKK were recruited in this study. Internet Addiction Test (IAT) and International Physical Activity Questionnaire short-form (IPAQ-SF) were used to measure respondents' internet addiction level and physical activity level, respectively. A total of 100 respondents were then selected randomly from the initial sample to administer the IAT for the second time to examine its 2-week test-retest reliability. Results show IAT mean score of 40.27 (15.28) and median for physical activity was 1981.50 (2954.00) MET-minute/ week. 29.8% of respondents reported no internet addiction, followed by mild (45.0%) and moderate addiction (25.2%). For respondents' physical activity level, result showed 13.3% of low physical activity level, 53.7% and 33% for moderate and high physical activity level respectively. This study indicated IAT has high internal reliability (Cronbach's alpha value = 0.093) and good test-retest reliability, tested by paired *t*-test ($t = 1.562$, df = 99, $p = 0.121$). However, IAT score was not significantly correlated with physical activity ($r = -0.065$, $p = 0.342$). In conclusion, IAT is reliable to be used among USMKK population. This study shows mostly respondents were at risk of developing mild and moderate level of internet addiction. However, internet addiction was not correlated with physical activity.

A38 Stress and metabolic syndrome among adults in Terengganu

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Environmental influences such as stress was believed to impact the metabolic disorder, which may progress to cardiovascular disease and type II diabetes. High levels of stress are now emerged as significant health factors among adult nowadays. However, studies on relationship between stress and metabolic syndrome are still scarce. Thus, this study aimed to investigate the association between stress and metabolic syndrome among adult in Terengganu. Subjects comprised 188 adults aged 20 to 59 years old. Anthropometric measurements included weight, height and waist circumferences (WC). Blood pressure (BP) was taken, fasting blood glucose (FBG), triglycerides (TG), high-density lipoprotein (HDL-C), low-density lipoprotein (LDL-C) and total cholesterol (TC) were determined in overnight fasting blood sample. Harmonized definition on metabolic syndrome was used to identify metabolic risk while stress level was assessed using Depression, Anxiety and Stress Scale-21. A total of 41.0% of male and 59.0% of female were overweight/obese. Prevalence of stress and metabolic syndrome was 17.6% and 39.4%, respectively. There were significant difference of stress score between the ethnicities with Malay showed the highest stress score, followed by Indian and Chinese ($p<0.001$). There was no significant association between gender, age, ethnicity, body weight status and metabolic syndrome with stress. However, there was significant association between body weight status and metabolic syndrome. Binary logistic regression showed that the odds of developing metabolic syndrome were 9.1 (95% CI: 2.0, 41.1) and 16.8 (95% CI: 3.8, 74.8) times higher in overweight and obese subjects, respectively. The findings of this study showed no significant association between stress and metabolic syndrome. Prospective cohort studies involving larger sample size in determining relationship between stress and metabolic syndrome are needed in future. Appropriate intervention programs should be planned to increase awareness and to promote healthy lifestyles in order to prevent obesity among adult and thus lower metabolic syndrome risk.

A39 Physical activity and its related factors amongst adolescents in Kuala Lumpur

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Physical activity is an important indicator of healthy lifestyle development during the adolescent period. This study aimed to determine physical activity and its related factors amongst Malaysian adolescents. Participants were 173 adolescents aged 13 to 17 years old from secondary schools in three school zones of Kuala Lumpur, namely Pudu/Bangsar, Keramat and Sentul. This study employed a self-administered questionnaire that was modified from Thailand Physical Activity Children Survey (TPACS) and translated into Malay. Overall, only 18.5% achieved the recommendation for physical activity, whereby the adolescents were physically active for a combined total of 60 minutes or more per day. About 53.8% were involved in organized sports, while only 26.6% used active transportation for travelling to or returning from school. Only 9.8% met sedentary activity recommendation, whereby they had two hours or less of screen time activity per day. Even though the majority of adolescents (88.4%) indicated that they had parental support for physical activity, only 19% of them were physically active. However, 56.7% adolescents were physically active during physical education class in school. More than half the adolescents reported that facilities for doing physical activity can be accessed within walking distance of less than 10 minutes from their residential area, including gymnasium (69.9%), fitness center (67.1%), sports venue (66.5%) and aerobic space or multifunctional space (62.4%). We conclude that physical activity amongst adolescents was not satisfactory even though they had parental support and suitable facilities close to their environment. Further investigation into the barriers and motivation towards physical activity may be helpful when planning physical activity promotion strategies for adolescents.

A40 Application of trans- theoretical model on fatty foods, fruits and vegetable consumption among overweight, obese and morbidly obese secondary school children

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Healthy behaviours such as healthy food intake and increase of physical activity can help adolescents to prevent obesity and other diet related diseases in later life. Inappropriate dietary habits especially among Malaysian adolescents have become a major public health concern that needs to be urgently addressed. The aim of this study was to identify the stages or processes of change on fatty foods, fruit and vegetable consumption based on a Trans –theoretical Model (TTM) in overweight, obese and morbidly obese secondary school children. A total of 1041 overweight and obese secondary school children aged 13, 14 and 16 years old with BMI-for-age > +1SD from 15 secondary schools in Kuala Lumpur, Selangor and Negeri Sembilan who had participated in the My Body is Fit and Fabulous

at school (MyBFF@school) were involved in this study. A validated TTM questionnaire, adapted from Prochaska et al, 1997 and Povey et al, 1999 studies was used to assess the stages of change of the respondents. The findings of the study showed that the status on the stage of change in fatty food consumption was pre-contemplation (5.1%), contemplation (7.0%), preparation (58.6%), action (20.9%) and maintenance (8.5%). However, the status on the stage of change for fruit and vegetable consumption was 30% and 40% at an action and maintenance stage respectively, followed by pre-contemplation (2.9%), contemplation (1.8%) and preparation (24.9%). In conclusion, there was a significant percentage of the adolescents were still at the preparation stage of changes for both fatty foods and fruits and vegetables consumption. Therefore, more effective nutrition intervention programme that focus on the importance of appropriate fruit and vegetable and fatty food consumption is warranted to improve the stages of changes of secondary school children.

B: Dietary Intake, Consumption Pattern & Disease

B01 Factors correlated with food addiction symptoms among undergraduate students in Universiti Putra Malaysia

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Food addiction is an addictive behaviour towards hyperpalatable food that generally high in sugar, fat, sodium or highly processed. Nevertheless, there are limited information on food addiction in Malaysia. Therefore, this cross-sectional study aimed to determine the correlations between socio-demographic factors, body compositions, psychological factors, dietary practices and food addiction symptoms among undergraduate students in Universiti Putra Malaysia (UPM). A total of 295 undergraduate students (168 females, 127 males) from three selected study programs have completed a set of self-administered questionnaire, and their body compositions were measured by the researchers. The present study found that 15.9% of the undergraduate students were classified as food addicted, with an average of 3.21±1.62 food addiction symptoms. Further, ethnicity was correlated with food addiction symptoms (r_s=-0.17, p=0.003), with Malays ranked the highest in relation to food addiction symptoms. Higher depression (r=0.39, p<0.001), anxiety (r=0.46, p<0.001) and stress (r=0.38, p<0.001), higher consumption of afternoon tea (r=0.14, p=0.001), dinner (r=0.12, p=0.048) and supper (r=0.17, p=0.004), greater risk of binge eating (r=0.48, p<0.001) and night eating (r=0.40, p<0.001), as well as higher intake of energy (r=0.21, p<0.001), carbohydrate (r=0.19, p=0.001), protein (r=0.19, p=0.001), fat (r=0.19, p=0.001) and sodium (r=0.19, p=0.001) were correlated with higher food addiction symptoms. No correlations were found between body compositions and food addiction symptoms. Multiple linear regression analysis showed that binge eating (Beta=0.352, p<0.001), anxiety (Beta=0.328, p<0.001) and high daily carbohydrate intake (Beta=0.141, p=0.004) contributed towards food addiction symptoms whereby these factors explained 34.6% of the variances in food addiction symptoms model. In conclusion, about one in five undergraduate students were found to have food addiction symptoms. University students who practiced binge eating, had anxiety and high intake of carbohydrate foods or beverages were associated with food addiction symptoms. Future intervention on food addiction is needed to focus on the psychological and dietary aspects of the undergraduate students.

B02 Association of snacking behaviour with depression and cardiovascular diseases risk factors among University students

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Depression is commonly associated with eating disorder. It is common for someone with depression to use food to deal with their emotion. Often, snacking has become one of their very first choices. In general, unhealthy lifestyle behavior such as snacking is likely to increase risk of developing cardiovascular disease (CVD). Therefore, it is vital for university students to adapt to a better snacking behavior in order to engage in healthy lifestyle and hence reduce the risk of CVD. This study was carried out to determine the association of snacking behavior with depression and CVD risk factors among them. A cross-sectional study was conducted on 114 university students in Klang Valley. Socio-demographic data, were obtained through face-to-face interview. Depression level and snacking behavior were assessed using Beck's Depression Inventory (BDI and food frequency questionnaire (FFQ) respectively. Anthropometric data were collected using SECA measuring tape for waist circumference, stadiometer for height and Bioelectrical Impedance (BIA) for body fat content. Lipid profiles and blood pressure were measured using CARDIO CHECK PA and OMRON digital blood monitor. Results showed that there was no significant association between depression with majority of the snack choices (P>0.05). However, fast food has shown a significant association where those with depression tends to consume more fast food (P<0.05). On the other hand, cereal & cereal products has shown an inversely association with depression (P<0.05). Only a few snack choices such as fast food and sweet products have shown significant association with CVD risk factors (p<0.05). This study conclude that depression has an association with consuming fast food and snacking on the sweet products and fast foods were associated with CVDs risk factors.

B03 Association between dietary intake and metabolic syndrome in Malaysian vegetarians

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This cross-sectional study aimed to determine the association between dietary intake and metabolic syndrome (MetS) among vegetarians in Kuala Lumpur and Selangor. This study consisted of 200 vegetarians, with an average age of 48.3±13.2 years, who were recruited from the community centers. The data on socio-demographic characteristics (sex, age, ethnicity), and vegetarianism practices (years of practising vegetarianism and vegetarian categories) were obtained using a self-administered questionnaire. The dietary intake was assessed using 3-day dietary recall, and the data were analysed using dietary analysis software, Nutritionist Pro. The waist circumference and blood pressure of the respondents were measured by the trained researchers. A total of 10.0 ml of fasting blood sample was collected from the respondents for blood glucose and blood lipid profiles analysis. Based on the Joint Interim Statement (2009), the prevalence of MetS was 21.0%. There was no significant difference in the total energy intake between vegetarians with MetS (1850±504 kcal/day) and vegetarians without MetS (1705±431 kcal/day) (p=0.063). Vegetarians with MetS had higher intakes of carbohydrate (288.0±88.4 g/day) and fiber (30.9±10.6 g/day) than vegetarians without MetS (258.8±69.6 g/day and 24.7±10.1 g/day); (p<0.05),

respectively. While dietary fiber was significantly associated with MetS (= 11.52, p=0.003), there were no associations between carbohydrate, protein, fat, cholesterol, saturated fatty acids, monounsaturated fatty acids, and polyunsaturated fatty acids and MetS (p>0.05). The multiple logistic regression showed that vegetarians with the highest intake of fiber were 3.61 times higher risk (95% CI:1.26-10.38) of developing MetS, after adjustment for sex, age, ethnicity, years of practising vegetarianism and vegetarian categories. The present study highlights an urgency to monitor the amounts and types of fiber consumed by the vegetarians. Longitudinal studies are needed to confirm the association between high fiber intake and MetS among vegetarians.

B04 Association between snacking frequency, dietary intake and body mass index among undergraduate students at Universiti Sains Malaysia Health Campus

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Snacking patterns among university students is crucial as it is associated with energy and nutrient intakes and subsequently body weight status. This cross-sectional study aimed to investigate the association between snacking frequency, dietary intake and body mass index of undergraduate students at USM Health Campus. Students from 3 different faculties were selected through systematic sampling technique and a total of 158 students who fulfilled the inclusion criteria participated in the study. Socio-demographic data was obtained using a questionnaire and body mass index was assessed by anthropometric measurement with height and weight measurement. Dietary data was assessed through two-day 24-hour dietary recall method and nutrient analysis was performed using the NutritionistPro™ software. The median snacking occasions was 1.5 times per day. Majority of the respondents (93.7%) snacked at least once from the two-day dietary recall. To analyze the snacking frequency, respondents were divided as more frequent snack eaters (MFSE) and less frequent snack eaters (LFSE) using median value. Results showed that majority of the respondents were MFSE (63.3%) and 36.7 % of them are LFSE. Most of the respondents (87.2%) snacked during afternoon, followed by evening snack (74.3%) and morning snack (35.8%). There was a significant difference between snacking frequency and energy intakes (p<0.001). MFSE contributed higher energy (p<0.001), carbohydrate (p<0.001), protein intake (p=0.099) and fat intakes (p=0.001). A total of 19.75% of daily energy intake came from snack consumption, while the energy contribution of carbohydrate, protein and fat intake from snacks were 10.47%, 1.99% and 6.97% of their daily energy intakes, respectively. Energy and macronutrient intakes from snacks among MFSE were significantly higher than LFSE (p<0.001). Besides, snacking frequency was found to be positively correlated with BMI (r=0.214, p=0.007). In conclusion, this study found that students with higher snacking frequency have higher dietary intake which may lead to higher BMI.

B05 Association between dietary intake, physical activity and macronutrient composition of breast milk among lactating women in Klang Valley

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In Malaysia, exclusive breastfeeding up to the age of six months, while continuing to breastfeed along with complementary feeding after the age of six months is recommended for infant feeding. Breast milk composition can be affected by several factors including maternal dietary intake, physical activity and environmental factors. This study was conducted to determine the association between dietary intake, physical activity level and macronutrient compositions of breast milk among lactating women in Klang Valley. Twenty subjects aged between 18 to 45 years old who are lactating and breastfeeding their infant between the age of 6 to 12 months were recruited. Dietary intake was obtained by using two days 24-hour diet recall and physical activity level was measured using a pedometer. A total of 60.0 mL of breast milk was collected from the subjects for macronutrient analysis. Mean carbohydrate, protein and fat intakes of the subjects were 108.0 g/d, 40.7 g/d and 32.4 g/d respectively. Mean carbohydrate and lactose content in breast milk were 26.8 g and 34.0% per 100 mL of breast milk. Average protein and fat content in breast milk were 15.96 g and 35.10 g per 100 mL of breast milk respectively. No significant association was observed between the subjects' carbohydrate, protein and fat intake with physical activity level (p>0.05). No significant correlation was observed between dietary carbohydrate intake with carbohydrate content of breast milk (p>0.05) with positive low correlation (r=0.190). There was no significant association between carbohydrate intake with lactose content of breast milk (p>0.05) with positive low correlation (r=0.264). No significant correlation between dietary protein intake with breast milk protein was observed (p>0.05) with negative low correlation (r=-0.124). There was also no significant correlation between dietary fat intake with breast milk fat content (p>0.05) with negative low correlation (r=-0.239). No significant association was observed between physical activity level and breast milk macronutrient composition (p>0.05). The results in this study suggested that macronutrient composition of breast milk may be independent of maternal dietary intake and physical activity level. This study also reported that there was no significant association between dietary intake and physical activity levels among lactating women.

B06 Infant and young child feeding practices among low household income families in Kuala Lumpur and Kuala Selangor

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A cross-sectional study was conducted to assess infant and young child feeding practices in Kepong, Kuala Lumpur and Kuala Selangor. The respondents were recruited among the bottom 40% (B40) household income families (<RM4360) as classified by Department of Statistical Malaysia (2016). 130 respondents (69 boys and 61 girls) were involved in this study. A Questionnaire completed by interview with the parents was used to obtain information on sociodemographic as well as infant and young child feeding practices. The mean age was 13.75±5.26 months old. The prevalence of early breastfeeding initiation within one hour of birth, ever breastfed and continued breastfeeding after six months old was 80.0% (95% CI: 73.03-86.97), 99.2% (95% CI: 97.71-100.75) and 71.3% (95% CI: 63.0-79.0) respectively. The prevalence of bottle feeding practices was 76.2% (95% CI: 69.0-84.0) and ever used a pacifier 45.7% (95% CI: 37.0-54.0). The prevalence of milk feeding frequency among children who were taking more than two feeds within 24 hours was 87.8% (95% CI: 80.88-94.68. The prevalence of minimum meal frequency (children who received solid, semi-solid and soft food for breastfed and non-breastfed children) was 93.5% (95% CI: 89.08-97.92). However, the prevalence of minimum dietary diversity (children who received foods from four or more food groups during the previous day) and minimum acceptable diet were only 59.7% (95% CI: 51.11-68.27) and 57.7% (95% CI: 48.87-66.58

respectively, indicating about only 6 in 10 respondents met the minimum dietary diversity and minimum acceptable diet. Thus, to ensure the optimal growth and development of the children especially in the first two years of life, there is a need for promotion, protection and support for optimal complementary feeding among infant and young children. It is important that parents are taught and given the knowledge on appropriate practices on complementary feeding and nutrition.

B07 Night Eating Syndrome (NES) among adults in Klang Valley

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Malaysia has the highest prevalence of obesity and overweight among the countries in Southeast Asia. Studies on the behavioral eating disorder especially Night Eating Syndrome (NES) are still limited in Malaysia. Therefore, this study aims to determine NES among adults in Klang Valley. A cross sectional study was conducted among 116 subjects aged 18-59 years old. Anthropometric measurements including height, weight, percent body fat, waist and hip circumference were taken for all subjects. Subjects self-administered the Night Eating Questionnaire (NEQ), however were interviewed for the 24-hour dietary recall. The prevalence of NES was 4.3%. All the NES subjects (n=5) were in the 18-29 years age group and were either normal weight or underweight. NES subjects fulfilled the NES criteria, such as morning anorexia, evening hyperphagia and nocturnal ingestion, with the most obvious characteristic was evening hyperphagia. All the NES subjects had little or no control over their eating after dinner time and exhibited nocturnal ingestion. Only one NES subject who was underweight consumed more than 25% of the total caloric intake during night eating, (31.74%), based on the 24-hour dietary recall. The prevalence of NES among adults was relatively low in this study, with no significant association between NES and body weight status (x^2=5.55, p=0.136). It is recommended that future studies should include qualitative study and physical activity questionnaires in order to determine NES more accurately.

B08 Association between socio-demographic factors and frequency of home-cooked meals among primary school children in Klang Valley

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Reduced consumption of home-cooked food has been shown to contribute to weight gain among adults, adolescence as well as children. Studies have revealed that home-cooking was associated with socioeconomic status in developed countries; however, studies relating to consumption of home-cooked meals among children in a multiethnic country like Malaysia remains unknown. This study aims to investigate the association between socio-demographic factors with frequency of home-cooked meals consumption among primary school children. A cross-sectional study was conducted among 291 children aged 9-11 years. A structured questionnaire that included frequency of home-cooked meal consumption (once a day or more than once a day) on both weekdays and weekend days was proxy-reported by parents. Body weight and height were measured and body mass index (BMI) was calculated. Overall, 78.7% and 75.0% of children consumed home-cooked meals more

than once daily on weekdays and weekend, respectively. A higher percentage of Indian children consumed more than once daily of home-cooked meals (40.6%) on weekdays, followed by Malay (32.8%) and Chinese (26.6%) children. Parental education level (father: r=-0.15, p<0.05; mother: r=-0.22, p<0.001) was associated with frequency of home-cooked meals on weekdays. Lower household income was also associated with higher frequency of home-cooked meals on both weekdays (r=-0.18, p<0.01) and weekends (r=-0.23, p<0.01). In conclusion, this study demonstrated that frequency of home-cooked meal consumption differs by ethnicity, parental education and household income among primary school children in Klang Valley. Future health promotion programmes that promote home-cooked meals should consider strategies that tailor to the needs of children from different socio-demographic backgrounds.

B09 Association between dietary intake with antioxidant and nitric oxide level in breast milk among lactating women

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The human breast milk is a source of food to the infant since birth, providing all the nutrients needed for growth and development of cells, immunological defense against pathogens and diseases. It contains many bioactive factors, which include anti-inflammatory agents, antioxidants, growth factors, and prebiotics, which are vital for the growth of the infants. The aim of this study was to investigate the association between dietary intake and the antioxidant and nitric oxide level in the breast milk among lactating women. A total of 20 breast milk samples were collected from lactating mothers around Klang Valley and kept frozen at -80°C until further analysis. Dietary intake was assessed using the 24-hour dietary recall method. The Total Antioxidant Capacity (TAC) analysis was conducted using Ferric Reducing Antioxidant Power (FRAP) and 2, 2-diphenyl-1-picrylhydrazyl (DPPH) assays. Nitric oxide (NO) analysis was performed using the Griess reagent and the analyses were carried out using a spectrophotometer at different wavelengths. Most of the subjects did not meet their recommended nutrient intakes of vitamins A, C and E. The mean values of assays of FRAP, DPPH and NO were 1.99±0.31mM/ml; 19.14±2.52mg/ml and 24.00±20.30uM/ml respectively. There was a moderate positive correlation between FRAP assay and vitamin E intake (r=0.402, p=0.079). However, there were no significant associations between dietary intakes and DPPH assay. A significant moderate positive correlation was reported between FRAP and NO assays (r=0.590, p=0.006). A negative weak correlation was observed between DPPH and NO assays (r=-0.328, p=0.158). Maternal intake of diet did not affect the antioxidant capacity of the breast milk and the nitric oxide level. Thus, there was no association established between the dietary intake, antioxidant and nitric oxide level in breast milk among lactating women.

B10 Validation of Food Frequency Questionnaire (FFQ) for dietary assessment among Malaysian preschool children aged 4 to 6 years

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This study was conducted to assess the validity and reliability of a Food Frequency Questionnaire (FFQ) for use among preschool children. The FFQ consists of 108 food items categorized into 13 food groups. Three-day dietary record (3DR) was used as the reference method, and reliability of FFQ was measured by repeated administrations. A total of 119 children aged 4 to 6 years took part in the validation study. A subsample of 30 children participated in the reliability study where FFQ was administered for a second time (FFQ2) two weeks after the first administration (FFQ1). Spearman's correlation showed strong and significant correlation (p<0.05) between FFQ and 3DR for intakes of energy, carbohydrate, and fat, which were r=0.605, r=0.568 and r=0.532, respectively, except for protein intake that showed moderate correlation (r=0.444). Bland-Altman plots showed less satisfactory agreement between FFQ and 3DR due to rather large values of mean differences and limits of agreement. Cross-classification analysis for intakes of energy, carbohydrate, protein, and fat illustrated that 88.2%, 86.6%, 77.3% and 84.9% of subjects were classified in the same or adjacent quartiles, respectively, while only 3.4%, 4.2%, 5.9% and 5.9% subjects were classified in the extreme quartiles, respectively. Correlation was significant and strong between FFQ1 and FFQ2 for the intakes of energy (r=0.961), carbohydrate (r=0.776), protein (r=0.830), and fat (r=0.870). Cronbach's alpha value for the intakes of energy, carbohydrate, protein, and fat were 0.968, 0.813, 0.857 and 0.953, respectively, between FFQ1 and FFQ2. Good reliability of FFQ was shown by Intraclass Correlation Coefficient (ICC) values which were 0.940 (energy), 0.692 (carbohydrate), 0.741 (protein) and 0.912 (fat). In conclusion, this FFQ has moderately satisfactory validity and high reliability; thus, we opine that it can be used as an evaluation tool for assessing intakes among Malaysian preschool children aged 4 to 6 years.

B11 The influence of social networking sites on disordered eating behaviours among undergraduates in Universiti Sains Malaysia Health Campus

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The use of social networking sites (SNSs) is increasing rapidly and particularly popular among young people, which worries as it can influence disordered eating behaviours. Hence, this study was conducted to determine the influence of SNSs on disordered eating behaviours among undergraduates in Universiti Sains Malaysia (USM) Health Campus. This is a cross-sectional study, whereby 152 undergraduates aged 19 to 24 in 1st to 5th year of academic were randomly selected from three schools in USM's Health Campus. A self-administered questionnaire, consisting of socio-demographic information, modified Generalized Problematic Internet Use Scale 2 (GPIUS2) and the Eating Attitudes Test (EAT-26) was used to collect the data. Mean GPIUS2 score was 50.78±16.21 and mean EAT-26 score was 11.18±9.70, with 15.8% of the participants being at risk for eating disorders. There was no significant association between gender, ethnicity, academic year, school and disordered eating behaviours. There were no mean differences in EAT-26 scores between gender, ethnicity, academic year, and school. Majority used Instagram (78.3%) followed by Facebook (70.4%), Twitter (19.7%) and the rest used WhatsApp and Snapchat (13.2%). Total time on SNSs was not correlated with disordered eating behaviours. However, there was correlation between problematic SNS usage and disordered eating behaviour (r=0.189, p=0.020). Problematic SNS usage can influence disordered eating behaviours among university students, hence further studies on other factors that could influence disordered eating behaviours among university students should be conducted.

B12 Factors associated with fast food consumption among adolescents in Gombak, Selangor

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Consumption of fast food is a global phenomenon and it occurs in most of the developed and developing countries. Previous studies found that adolescents consume fast food more frequently than other age groups. Frequent consumption of fast food may lead to obesity and chronic diseases. This cross-sectional study aimed to determine the associations between personal factors, environmental factors and psychological factors with fast food consumption among adolescents. A total of 433 adolescents (43.0% males and 57.0% females) with a mean age of 13.74±1.28 years old from a government school in Gombak, Selangor, participated in this study. A self-administered questionnaire consisting of socio-demographic background, home food availability, media exposure, depression, anxiety, stress, disordered eating, and fast food consumption were completed by the respondents. Body weight, height, waist circumference and blood pressure were measured by the researchers. Results showed that 27.7% of the respondents were frequent fast food consumers (≥3times/week), where the main reason for choosing fast food was due to the taste of food (71.6%). Around 5.8% of the respondents were thin and severely thin, 37.7% were overweight and obese, 31.2% were abdominally obese, 8.3% had pre-hypertension, 15.2% had hypertension class I and 11.8% had hypertension class II. Age (r=-0.113, p<0.05), daily pocket money (r=0.148, p<0.01) and waist circumference (r=0.132, p<0.01) were significantly correlated with frequency of fast food consumption. In conclusion, this study suggests an urgent need for nutrition interventions to target eating behaviors of adolescents.

B13 Association between body composition and caffeine intake in relation to blood pressure level in undergraduate university students of Universiti Putra Malaysia

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There is an increase in hypertension prevalence among Malaysian adults and based on the National Health and Morbidity Survey 2015, it was estimated that 30.3% of the adult aged ≥ 18 years old was diagnosed with hypertension [systolic blood pressure (SBP) of ≥ 130mmHg and diastolic blood pressure (DBP) of ≥80mmHg]. A study in Universiti Malaysia Sarawak in 2010 found that 42.9% of undergraduate students were classified as prehypertension. There are many factors that might affect blood pressure (BP) and body composition plus caffeine intake have been shown to be two of the main factors. Therefore, the study was aimed to investigate the association between body composition and caffeine intake with BP level in students in Serdang. A total of 195 female and 24 male participants with mean±SD aged of 21.86±1.34 years completed a questionnaire on socio-demographic and caffeine consumption habits. Height, body weight, body fat percentage (BFP), waist circumference (WC), hip circumference (HC) and BP level were measured. A Pearson coefficient correlation test was carried out to determine the association between the variables. SBP level was found to be associated with WC (r=0.37, p<0.0001), HC (r=0.36, p<0.0001), WH ratio (r=0.21, p=0.002), BFP (r=0.16, p=0.162) and body mass index (BMI) (r=0.34, p<0.0001). DBP level was found to be associated with WC (r=0.42, p<0.0001), HC (r=0.45, p<0.0001), WH ratio (r=0.19, p=0.004), BFP (r=0.31, p<0.0001) and BMI (r=0.42, p<0.0001). However, there

was no significant association found between mean±SD of caffeine intake (301.72±110.41) ml with BP levels. Based on the findings, body composition could be one of the factors that leads to a higher BP level. These findings highlighted the importance of establishing intervention program at the early life stage to attempt and reduce the incidence of adulthood hypertension in later life.

B14 Knowledge, attitude, risk perception towards the usage of repeatedly heated cooking oil among food providers at UiTM Puncak Alam and Puncak Perdana campus

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Frying method is a common method used by cooks to enhance a good taste, texture and also the colour of food. However, there are some health effects associated with the usage of repeatedly heated cooking oil (RHCO) such as cancer, liver and kidney problem and other serious diseases including intestine damages. Therefore, this study aims to assess the level of knowledge, attitude, risk perception towards the usage repeatedly heated cooking oil among food providers at UiTM Puncak Alam and UiTM Puncak Perdana. A descriptive research design was employed by using a quantitative approach with a self-administered questionnaire in April 2018. In addition, a 500 ml of oil sample was collected from 41 premises and later was evaluated for a total polar compound using Testo270. The data were analyzed using Microsoft Office Excel 2010 for the descriptive statistics. The respondents (n = 80) were shown to have a moderate knowledge (54%) and attitude (68.75%), but they have a good practice (79.6%) and risk perception (76.8%) towards the usage of RHCO. Out of 41 oil samples collected, the majority of the oils used were in safe level and only three samples were at-risk level. Based on the findings, further effort should be done by the government in educating the food handlers related to the usage of RHCO in the cooking activities. Further emphasis should be given to food providers who prepare and serve foods to vulnerable groups including children, schoolchildren and elderlies.

B15 The influence of personal factors towards fruits and vegetables intake: a preliminary study among undergraduate students at UiTM Puncak Alam, Selangor

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The intake of fruit and vegetable plays an important role in preventing diet-related chronic diseases. However, the majority of Malaysians do not consume adequate fruit and vegetable daily. Factors such as socio-environmental factors, personal factors and psychosocial factors are reported to influence fruit and vegetable intake. Therefore, this study aims to investigate the influence of personal factors towards fruit and vegetable intake among undergraduate students at UiTM Puncak Alam, Selangor. The study was conducted in April 2018 and May 2018. A self-administered questionnaire contained questions concerning

personal factors namely taste preferences, health and nutrition attitudes, weight and body concern, dietary intention and self-efficacy as independent variables, and fruit and vegetable consumption as a dependent variable. The questionnaires were disproportionately distributed among undergraduate students of business and management cluster, UiTM Puncak Alam. The data were analysed using SPSS version 24 for descriptive statistics, Pearson correlation coefficient and Multiple Linear Regression. Out of 200 questionnaires, only 177 questionnaires were returned and usable for data analyses. The study revealed that taste (r = 0.336, p < 0.001), dietary intention (r = 0.251, p < 0.05) and self-efficacy (r = 0.412, p < 0.001) were significantly correlated with the fruit and vegetable consumption. In addition, self-efficacy was the main predictor in determining student's consumption of fruit and vegetable. In conclusion, this study suggests a need to facilitate self-efficacy among Malaysia population in order to increase the fruit and vegetable intake.

B16 Associations of socio-demographic background, food group intakes and eating behaviours with sleep quality among primary school children in Batu Pahat district, Johor

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Sleep plays a crucial role in child development and is related to child's well-being. Therefore, the present study aimed to determine the associations between socio-demographic background, food group intakes, eating behaviour and sleep quality among primary school children in Batu Pahat, Johor. This study involved 627 pairs of children, and their parents, who were randomly selected from six primary schools in Batu Pahat, Johor. The parents completed all children's information such as demographic characteristics, sleep quality, food group consumptions and eating behaviour. Sleep quality that based on the average total sleep disordered score was 52.3±7.8 (boys: 52.2±8.4;girls: 52.4±7.1;t=-0.395, p=0.693). As for sleep quantity that based on self-reported mean sleep duration was 8.8±1.2 hours/day (boys: 8.8±1.2;girls: 8.9±1.2;t=-0.610, p=0.542). Parental year of educations (father: r=-0.095, p<0.05; mother: r=-0.136, p<0.05), total household income (r=-0.128, p<0.05), frequency intake of vegetables (t=2.137, p<0.05) and milk and dairy milk products (t=2.191, p<0.05), eating behaviour including desire to drink (DD) (r=0.176, p<0.05), food responsiveness (FR) (r=0.245, p<0.05), emotional overeating (EOE) (r=0.267, p<0.05), satiety responsiveness (SR) (r=0.192, p<0.05), emotional under-eating (EUE) (r=0.185, p<0.05), and slowness in eating (SE) (r=0.175, p<0.05) were significantly correlated with sleep quality. Meanwhile, age (year) (r=-0.168, p<0.05), total household income (r=0.183, p<0.05), DD (r=0.057, p<0.05) and FR (r=0.058, p<0.05) were significantly correlated with sleep duration. About 14.5% of variances in poor sleep quality was explained by higher education of mother (β=-0.118), low household income (β=-0.097), less vegetable intakes (β=-0.081), higher EOE (β=0.174), increased FR (β=0.137) and increased SE (β=0.167) (F=17.560, p<0.05). Further, the household income (β=-0.183) and age (β=-0.171) found to be significantly explained 6.2% of the variances in sleep duration (F=20.565, p<0.05). In short, although the associations seem small, socio-demographic background, food group intakes, and eating behaviour should be taken into consideration to improve the quality and quantity of sleep in children.

B17 Association between body composition and polyphenol intake in relation to blood pressure level in students of Universiti Putra Malaysia

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Polyphenol intake and body composition have been shown to be two of the important factors that might affect blood pressure. It was reported in the National Health and Morbidity Survey 2015 that 30.3% of the adult aged 18 years old and above was diagnosed with hypertension. In a recent study carried out in university students residing in Shah Alam, it was shown that the prevalence of hypertension was approximately 10%. Therefore, the aim of this study was to investigate the association between body composition and polyphenol intake in relation to blood pressure level in undergraduate students in Serdang. A total of 211 undergraduate students (167 females, 44 males) with mean±SD aged of 22.16±1.58 years completed a questionnaire on socio-demographic and tea consumption habits. The participant's body weight, height, body fat percentage (BF%), waist circumference (WC), hip circumference (HC) and blood pressure (BP) were measured. The analyses carried out using Pearson coefficient correlation tests showed that SBP level was found to be associated with body mass index (BMI) (r=0.40, p<0.0001), BF% (r=0.20, p<0.003), WC (r=0.39, p<0.0001), HC (r=0.34, p<0.0001) and waist to hip ratio (WHR) (r=0.27, p<0.0001). DBP level was found to be associated with BMI (r=0.44, p<0.0001), BF% (r=0.34, p<0.0001), WC (r=0.38, p<0.0001), HC (r=0.37, p<0.0001) and WHR (r=0.20, p=0.003). However, the study did not found a significant association between mean±SD tea consumption (108.16±78.22) ml with both SBP and DBP levels. The findings showed that body composition was one of the potential risk factors that may increase blood pressure levels, but not polyphenol intake from tea consumption. It was important to note that the awareness of hypertension at early life stage such as in adolescence period is crucial to possibly reduce the risk of developing hypertension during adulthood.

B18 The prevention of silent killer disease: planning dietary intake for hypertension sufferers

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Hypertension is a condition that is often found in primary health care in Indonesia. Long-term hypertension can cause serious problems with non-communicable diseases such as kidney failure, heart disease, and stroke. This study aims to describe the prevention of silent killer disease with planning the consumption of food intake for hypertension sufferers. This study is descriptive through collect information from literature studies, journals, and secondary data. The result of this researches indicated that hypertension can be classified into pre hypertension, first stage of hypertension, and second stage of hypertension. Hypertension can be caused by several risk factors including age, sex, family hypertension history, genetics, smoking habits, excessive salt consumption, saturated fat consumption, used cooking oil, alcoholic beverages, obesity, lack of physical activity, stress, and the use of estrogen. Hypertension caused by a combination of lifestyle factors, less activity, and diet can occur to about 90% of people with hypertension. The bad prognosis of hypertension can be prevented by plotting the daily consumption of food in the patient. Foods recommended for people with hypertension are fresh foods, processed foods without or little use of salt,

animal protein source, and fresh milk 200 ml/day. Then the foods to avoid are the brain, kidneys, lungs, heart, mutton, processed foods using sodium salt, canned food and drinks, preserved foods, butter and cheese, spices such as sauces and soy sauce, and foods that contain alcohol. Furthermore, hypertension sufferers should limit the use of salt kitchen (6 grams/day) and the use of foods containing sodium. Setting the correct diet pattern in hypertension sufferers can prevent sudden death due to hypertension.

B19 Food label: Do adolescents in Malaysia read it?

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Food labelling is one of the means of communication between the producer and seller of food on one hand, and the purchaser and consumer on the other (FAO/WHO, 2007). Hence this study aimed to determine the prevalence of adolescent reading food label and the characteristics of reading food label among adolescents aged 13 to 17 years old in Malaysia. Data was obtain from Adolescents Nutrition Survey 2017 which involved adolescents aged 13 to 17 years old. This is a cross sectional study with two-stage stratified cluster sampling to obtain a nationally representative sample. This study was carried out using a self administered questionnaire. Data analysis were done using SPSS version 21.0. The answers were captured whether they have always, sometimes and never read food label.This study findings showed that, 33.2% (95% CI: 31.94, 34.57) of adolescents in Malaysia reported as always reading food labels and only 15.5% (95% CI: 14.56, 16.48) reported as never reading food labels when buying or receiving food. The food label being not interesting was the main reason for not reading food labels [38.0%(95%CI: 35.13,40.98)]. Most of them only read the expiry date, 78.6% (95%CI: 78.61,77.21), and only 17.3% (95%CI: 16.22,18.39) read the nutritional claim. Among the adolescent who read the food label, most of them look at the fat content which was significantly higher among girls as compared to boys [47.7% (95%CI: 45.74,49.57) vs 32.5%(95%CI:30.97,34.09)]. In conclusion, majority of the adolescent read food label but only read the expiry date. Efforts need to be taken to make sure that the food label is more interesting and encourage adolescent to read the important facts such as nutrition facts, nutrition claim and food ingredients when making their food selection.

B20 Home food availability, dietary intake and socioeconomic status of primary school children in Kubang Kerian, Kelantan

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The increasing prevalence of childhood overweight and obesity has become a major public health concern in Malaysia. Several decades ago, the drastic shifting of dietary practice to energy dense food influences the children to adopt poor dietary practice. Home food availability is a potential home environmental factor contributing to dietary intake of children. This cross-sectional study examined the home food availability and its association with the dietary intake of primary school children in the city of Kubang Kerian. The association between the socioeconomic status of family and home food availability was also identified.

A total of 217 primary school children aged between 9 and 10 years old were recruited using a systematic sampling method. Home food availability was assessed by the International Study of Childhood Obesity, Lifestyle and Environment (ISCOLE) Neighbourhood and Home Environment Questionnaire. Dietary intake of children was assessed using semi-quantitative children food frequency questionnaire. Both questionnaires were administered by parents or caregivers as their children's proxy. Socioeconomic status was determined by the household income per capita and parents' education level. Home availability of fruits and vegetables, confectionary, dairy and sugar sweetened beverage (SSB) were significantly associated with the dietary intake of children (p<0.05). Household income per capita and parents' education level were significantly associated with the home availability dairy but not associated with the home availability of fruits and vegetables, confectionary and sugar sweetened beverage (p<0.05). In conclusion, home food availability potentially affects the dietary intake of children and the socioeconomic status may also effect the home availability of dairy. Parents play a crucial role in shaping a supportive home food environment by provision of healthy food to foster healthy dietary behaviour among the children and will eventually help to maintain a healthy weight status.

B21 Meal experiences of in-patients at hospital Universiti Sains Malaysia (HUSM)

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Compromised food consumption often leads to food wastage, re-admissionand subsequently malnutrition and other adverse health outcomes. Improving hospital food must take into account patients' perception, hence this study was conducted to explore patient's meal experience at the HUSM from January 2018 until Jun 2018. This is a qualitative research, whereby purposive sampling method was used to conduct semi-structured interview (face-to-face) among 23 patients from the Obstetrics and Gynecology, Medical, Opthalmogy, and General-Surgery wards. The semi-structured interviews included themes such as food quality, food services and eating environment. Patients aged 19-56 years old, who were on normal diet and have consumed hospital food, well enough to participate with length of stay more that 2 days, without cognitive or emotional impairs, who were not on enteral or parenteral feeding, not ventilated, and able to understand and speak Bahasa Malaysia and/or English were included in this study. Data was managed and analysed using NVivo. Findings indicated that patients' meal experiences was mostly influenced by factors such as food quality (taste, temperature, presentation, plate time collection), staffs' attitude, utensils, and food ordering. Other factors such as the environment and social element (visitors and other patients in wards) and patients' tolerance and expectations. Patients indicated that although they were dissatisfied with any aspects, they choose to remain silent. However, they suggested various improvements to the hospital food, which will motivate them to eat better. Study indicated that meal experience portrayed patients' satisfaction, and if the factors are improved, it will optimise the food service quality, improve the meal experiences, and surely aid patients' recovery.

B22 Consumption of sugar-sweetened beverages and its associated factors among adolescents in Gombak, Selangor

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Recent evidence suggests that adolescents are the major consumer of sugar-sweetened beverages (SSBs) that are high in calorie and can be linked to non-communicable diseases. A cross-sectional study was conducted to determine the amount of SSBs consumption among adolescents and its associated factors. A total of 421 secondary school students aged 13.30±1.28 years (41.8% males, 58.2% females) in Gombak, Selangor participated in this study. Respondents completed a set of Malay language self-administered questionnaire on socio-demographic background, physical activity, screen-viewing behaviour, sleep behaviour, frequency of fast food intake, home food availability, peer social pressure, parenting practice, and SSBs intake. Height, weight, waist circumference (WC) and blood pressure (BP) of the respondents were measured. Results showed that 9.8% of the males and 2.4% of the females were thin and severely thin, while 41.1% of the males and 35.6% of the females were overweight and obese. One third of the respondents (30.6% males, 31.8% females) had abdominal obesity. As for BP, 10.0% had prehypertension, 18.3% had stage 1 hypertension and 6.0% had stage 2 hypertension. The total SSBs intake per day was 1038.15±725.55 ml, where males consumed significantly higher amount of SSBs than females (p= 0.001). Screen-viewing behaviour (β=0.183), age (β=-0.199), sleep behaviour (β= 0.233), sex (β=0.181), daily pocket money (β=0.148), WC (β =-0.126) and fast food intake (β=0.097) were significantly associated with SSBs intake (R^2 =0.212, F =13.092, p<0.001). In conclusion, SSBs were commonly consumed by adolescents in this study. Promoting healthy lifestyle may help to reduce the consumption of SSBs among adolescents.

B23 Hydration status and performance of National Elite lawn bowl players during Ramadan

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Ramadan fasting is the mandatory act of food and fluid restrictions for Muslims from sunrise to sundown for a month. The abstinence of food and fluids during the day in athletes has raised concern from the coach for the Muslim lawn bowlers to perform during Ramadan. This study examined the hydration status and competition performance of National Elite Lawn Bowlers (n=12, 6 Males & 6 Females) during Ramadan. Hydration status was assessed using morning Urine Specific Gravity (USG); and competition performance was analysed based on match success rate by the Performance Analysist. Urine samples (n=82) were collected for 8 days, and the success rate (n=41) results were collected on 5 competition days. Fasting athletes have significantly higher success rate (70.1±11.7%, p<0.05) compared to non-fasting (57.3 ±11.8%) athletes, but no significant difference was found with half-day fasting athletes (61.8±16.9%). The non-fasting athletes performed poorer than fasting group may be due to their suboptimal physical - menstruating & illness, hence did not fast. Fasting athletes who performed well may be due to the high devotion to their religious faith which helps them cope with training and competition. The success rate of well-hydrated athletes (76.75±3.5%, p<0.05) was significantly better than minimally dehydrated (62.4±14.1%) athletes but not significant with significant/severely dehydrated (69.3±11.6%) athletes. Significant/severely dehydrated athletes may have the awareness of rehydrating immediately upon realizing their dehydrated state. No significant difference was found in the daily hydration status of fasting (USG=1.017±0.007), non-fasting (USG=1.016±0.007) and half-day fasting (USG=1.019±0.005) athletes. In conclusion, the competition success rates were significantly higher for fasting and well hydrated athletes. The overall hydration status of athletes are minimally dehydrated regardless of their fasting status. Future nutrition intervention could include pre-Ramadan nutrition education and close monitoring of nutritional status to minimize detrimental effects of dehydration during Ramadan.

B24 Stress and snacking behaviours among university students and its association with the risk of type 2 diabetes

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Stress is often reported among university students due to academic and social demands. Snacking on high fat/sugar foods and beverages was widely reported as coping strategy in stressful situation. Therefore, stress-related eating can contribute to weight gain and potentially leading to obesity and thereby increase the risk of getting T2DM. Study showed that Asians commonly develop diabetes at younger ages. Hence, it is crucial to identify the impact of stress related snacking on the risk of getting T2DM among university student in Malaysia. Objective of this study is to determine the associations of stress on snacking behaviours and the risk of T2DM among Malaysian university students. A cross sectional study was conducted on 114 students from private universities in Klang Valley. Data on socio-demographics, snacking behaviours and psychological stress level were collected through self-administered questionnaires and DASS-21 questionnaire. Anthropometric measurement on subjects' weight, height, waist circumference and percentage of body fat were collected using SECA weighing machine, stadiometer, measuring tape and Bioelectrical Impedance (BIA) respectively. The fasting blood glucose (FBG) was measured using blood glucose meter through finger prick method. Results showed stress was inversely associated with snacking on beverages and cereal products (p<0.05). The portion size of snacks was associated with BMI and percentage of body fat (p<0.05) and inversely associated with WC (p<0.05). Frequency of snacking was associated with FBG. We conclude that stress among university students was associated with snacking behaviours and the behaviours of snacking was associated with BMI, percentage of body fat and FBG. However, these associations were only observed with certain types of snacks such as beverages and cereal products and not with other type of snacks.

B25 Knowledge, perception, and consumption patterns of Prophetic food and remedies among Mauritians of Islamic faith

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Traditional therapies are frequently adopted to treat and/or manage a panoply of diseases, offering intense therapeutic benefits in Mauritius. One segment of the population that relies heavily on such therapies is the Muslim community, which represents 17.3% of the population. Nonetheless, there has been no study to probe into the understanding of such cultures and traditions on eating and treatment regimens of the Muslim community in Mauritius. Indeed, food has always been the sustenance of mankind since its existence on earth and has been well defined in Islam. Prophetic medicine merely denotes the actions done and thoughts mentioned by the Prophet Muhammed (PBUH) in connection to treatment, nutrition, and hygiene. This study sets out to explore the knowledge, perception, and consumption patterns of Prophetic food and remedies among the Muslim community in Mauritius. A cross-sectional survey was adopted to interview Muslims (n=384), from rural and urban regions, using a convenience sampling method *via* an adapted questionnaire. Women were found to possess good knowledge of the foods referred to in the Quran and Hadith and were the most frequent users of such foods. The most common Prophetic foods consumed were dates and grapes while the least common was quince. A statistically significant difference between in the mean consumption of prophetic food and remedies

across different age groups (p=0.001) and across different education levels (p=0.000) was recorded. A positive correlation (r=0.169) was obtained between consumption of prophetic food and remedies and preference of prophetic food and remedies. This study has established baseline data and provided a first insight on the knowledge and consumption patterns of prophetic food and remedies in Mauritius. It is anticipated that this study will open new avenues for research to preserve and promote the value of such food and remedies for the future generations.

B26 Food insecurity, food expenditure and diet quality among university students in Klang Valley

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Food insecurity, defined as limited access to sufficient, safe and nutritious food, is a public health concern. A previous study showed that over two-thirds of Malaysian students from public universities are food insecure. However, there is limited information on the assciation of food insecurity with food expenditure and diet quality. The objective of this study was to examine food insecurity, food expenditure and diet quality among university students in Klang Valley. This study involved 95 students (42 males, 53 females) between the age of 18 to 25 years from three local public and two private universities. Subjects filled in a questionnaire which included social demographic data and USDA Food Security Survey Module. Each subject recorded his food intake and food expenditure for four non-consecutive days using an electronic food diary application IMBAS™. The Malaysia Healthy Eating Index (HEI) was used to determine the diet quality of subjects. Results showed that 63.2% of subjects (50% males, 50% females) were food insecure. Their average daily food expenditure was RM9.20. Majority of subjects (96.8%) recorded low diet quality with HEI score less than 46%. Most of the HEI components did not meet the recommendations of the Malaysian Dietary Guidelines (MDG), especially for food group intake of vegetables, fruits, milk and milk products and legumes. There was no significant difference between public and private university students for food expenditure (p=0.294), food insecurity (p=0.498) and diet quality (p=0.117). No association was found between food expenditure and food insecurity. Food insecurity was associated with poorer diet quality (r=-0.261, p<0.05). In conclusion, the majority of students in public and private universities experienced food insecurity and had low diet quality. It is important for government and related agencies to consider appropriate strategies to increase financial assistance and/or reduce food cost for the needy university students.

B27 Comparison between food diary mobile application with paper-based food diary and 24-hour dietary recall among adults: The method of triads

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Food diary mobile application refers to image-assisted dietary assessment method, which is a novelty in Malaysia. This study applied the method of triads to determine validity of a newly developed food diary mobile application, namely Individual Meal-based Assessment Snapshot (IMBAS™). IMBAS™ is validated against seven-day paper-based food diary (PBFD) and multiple 24-hour dietary recalls (24DR). This cross-over study involved 13 men and 33

women aged 18 to 60 years, randomly assigned into two groups (A and B). Group A recorded dietary intake using IMBAS™ while Group B used PBFD for the first 7 days; thereafter switched methods in the second week of diet recording with a wash-out period of 5 to 7 days in between. Between two to three 24DR were conducted, on a day prior and/or a day after completing diet record using IMBAS™ and PBFD. Energy and macronutrient intakes were calculated using IMBAS™ analysis site and Nutritionist Pro software was applied for dietary records from both PBFD and 24DR. Validity coefficient (VC) of IMBAS™ was highest for protein (0.710); while PBFD produced lowest VC for protein (0.635). However, higher VC was produced by PBFD for energy (0.779), carbohydrate (0.864) and fat (0.650) intakes. Overall, VC for IMBAS™ ranged between 0.428 (fat) to 0.732 (energy). Significant differences were observed between IMBAS™ and 24DR for mean intake of energy, carbohydrate and protein (all $p<0.05$) while no significant difference was observed between IMBAS™ and PBFD. Moreover, IMBAS™ *vs.* 24DR produced larger percentage difference compared to IMBAS™ *vs.* PBFD for energy (-8.4±26.3 *vs.* 0.5±27.6), carbohydrate (-8.3±32.8 *vs.* 2.8±31.9) and protein (-9.0±31.2 *vs.* -2.0±39.4). In conclusion, IMBAS™ produced high VC compared to the two reference methods. This demonstrated that IMBAS™ could be used as a valid alternative method for dietary assessment.

B28 Pilot study: nutritional status, dietary intake and habits in relation to body composition among foreign construction workers

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Malaysia construction industry is highly relying on foreign workers to satisfy 70% of the manpower which contributes greatly to the country's economy and development. Thus, the nutritional status of foreign construction workers is highly concerned which it strongly relates to productivity, safety and health. This research aimed to report the nutritional status, body composition and nutritional knowledge of foreign construction workers. This is a cross-sectional pilot study. 35 Indonesian and Bangladesh subjects were recruited. Anthropometry and dietary measurement was carried out. It is found that 54.4% of subjects were overweight/obese and the mean BMI was 23.52±3.30kg/m^2. Around 30% of the subject had elevated systolic and diastolic blood pressure. Only 21.5% of monthly income or RM406.14±161.601 was spent on food, which was relatively low in cost. There were low nutritional knowledge among workers (knowledge toward dietary recommendations = 35.56±12.29%; food groups = 24.92±11.91%; healthy food choices = 13.41±14.13%; diet, disease and weight management = 25.99±10.79). Such findings suggested that subjects might be consuming energy-dense and relative nutrient-poor foods. There 88.6%, 77.1% and 37.1% subject had adequate or excess macronutrient intake for carbohydrate, protein and fat, respectively. Nonetheless, less than 15% of the subjects had adequate intake of micronutrients include thiamin, niacin, folate, vitamin D, vitamin E, calcium, and potassium. Only 25.7%, 31.4% and 80% of the subject had adequate intake of riboflavin, vitamin C, and vitamin A, respectively. More than 50% subject have excessive intake of sodium. More than 30% of subjects had only 2 meals per day. In conclusion, poor dietary intake and low nutritional knowledge score which reflected into overweight/obese and hypertension risk in current pilot study urges the need to conduct a full scale research in near future to improve the nutritional status of foreign construction workers.

C: Nutrients & Other Components in Foods/Products

C01 Proximate composition, total phenolic content and total flavonoid content of wheat bread and quinoa-wheat composite bread

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Consumption wheat grain (*Triticum aestivum*) particularly refined wheat has been increasing worldwide. This leads to overconsumption and consequently caused overweight, obesity, diabetes mellitus and many other health problems. Therefore, this study suggested the consumption of ancient health grain as health alternative grain to improve the nutrition of society. The ancient health grain is quinoa (*Chenopodium quinoa wild.*). Thus, the aim of this study was to investigate proximate composition, total phenolic and total flavonoid content of wheat bread and quinoa-wheat composite bread. Proximate composition of wheat bread and quinoa-wheat composite breads including moisture, ash, protein and fat content were determined using Official Methods of Analysis of AOAC International. Whereas, total available carbohydrate of wheat bread and quinoa-wheat composite bread were determined using Anthrone assay. Wheat bread showed statistically higher in moisture and carbohydrate content than quinoa-wheat composite bread. In addition, quinoa-wheat composite bread showed statistically higher in ash and fat content. Furthermore, no significant difference in protein content between wheat bread and quinoa-wheat composite bread. Other than that, 99% methanol crude extracts from dried wheat breads and quinoa-wheat composite bread were investigated for their total phenolic content and total flavonoid content. The total phenolic content was determined using a Folin-Ciocalteau reagent whereas total flavonoid content was determined using Aluminum Chloride colorimetric method. Among the breads, quinoa-wheat composite bread was significantly higher in total phenolic content and total flavonoid content than wheat bread. Therefore, addition of 10% quinoa flour into wheat bread increased ash, fat, total phenolic and total flavonoid contents into wheat bread. Quinoa can be the potential health alternative that can be added to wheat bread because of its advantages in nutrient contents.

C02 Determination of total starch, amylose, amylopectin and resistant starch in banana at different ripening stages

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The objective of this study was to determine the total starch, amylose, amylopectin, resistant starch and the ratio of amylose and amylopectin in banana at different ripening stages. The study was carried out as the prevalence of obesity and diabetes in Malaysia has increased over the years. The information of sugar content changes in tropical fruits throughout the ripening stages can serve as important information for healthcare professionals to advice the general public especially the diabetic patients. Amylose and amylopectin was determined

by using UV-spectrophotometer with the absorbance at 625 nm for amylose and 548 nm for amylopectin respectively. Ratio of amylose and amylopectin was determined by using the formula of amylose divided by amylopectin. Megazyme Resistant Starch assay kit was used to determine the resistant starch and total starch contents. One-way ANOVA was used to test the difference of five variables. There were significant difference between amylose, amylopectin, resistant starch and total starch content of banana at three different ripening stages, at (p<0.05). There were significant difference between the amylose, amylopectin, resistant starch and total starch content of banana at three different ripening stages. The amylose, amylopectin, resistant starch and total starch content have decreased from unripe to fully ripe. The outcome from this study have important information on monitoring blood sugar levels for diabetic patients.

C03 Effect of cooking methods on resistant starch, amylose, amylopectin and total starch content of white rice

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Rice is an essential staple and one of the most favoured foods consumed by Malaysians. However, the prevalence of diabetes in Malaysia is found to be increasing. Researchers have also found that high consumption of white rice is linked with an increased risk of type 2 diabetes, as rice starch is generally digested rapidly after ingestion. In fact, the digestibility of starch can be altered due to various processing and cooking methods of rice. To date, the effect of different cooking methods on the starch content of white rice commonly consumed in Malaysia remains unclear. Thus, this study was conducted to compare the amylose, amylopectin, resistant starch and total starch content between white rice that are cooked using conventional rice cooker method and draining method. In this study, Jasmine Sunwhite fragrant rice was used. After cooking through conventional rice cooker and draining method, the cooked rice was homogenised and freeze-dried to obtain dry and fine powdered rice samples. Rice samples were analysed in triplicates for each of the starch components. Amylose and amylopectin were analysed by dual-wavelength iodine binding colorimetry method. Resistant starch and total starch were analysed by AOAC Official Method 2002.02. When comparing between the two cooking methods, draining method resulted in higher amount of amylopectin, resistant starch, non-resistant starch, and total starch in the rice samples; conventional rice cooker only resulted in higher amount of amylose in the rice samples. However, the differences in starch components between the two cooking methods were only significant for non-resistant starch (p=0.006) and total starch (p=0.006). With significantly higher amount of non-resistant starch and total starch that can be readily digested and absorbed after ingestion, eating white rice that is cooked with draining method will generate higher postprandial blood glucose response, making it a relatively unsuitable choice especially for diabetic individuals.

C04 Nutritional composition, sugar profiles and sensory acceptability of ambarella (*spondias dulcis)* jam using different types of sugar

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Ambarella fruit (*Spondias dulcis*) grown in many regions in different countries of the world and known under many different names. They were grown as one of the backyard fruit trees and home garden and has many health benefits and medicinal properties and contain good nutritional values. Besides, ambarella fruit also was used to make jams, jellies and preserves. The fruit was added to soups, sauces and stews as flavourings. This study was conducted to develop ambarella jam that have different formulations, to analyse the proximate composition, sugar profiles and to evaluate the sensory acceptability of ambarella jam using different types of sugar. Generally, ambarella jam formulated with stevia powder showed significantly ($p < 0.05$) higher in moisture, ash and protein content while lower fat and carbohydrate values were recorded as compared to other ambarella jam formulations. While, ambarella jam formulated with white sugar had significantly higher fat content. Carbohydrates content in ambarella jam formulated with brown sugar showed higher amount (57.07±0.27) while ambarella jam formulated with stevia powder recorded the lowest value (34.26±0.28). As for calorific value, the amount were comparable and there were no statistically different among the ambarella jam formulations. For sugar content, the amount of glucose content in all formulations of ambarella jam was not significantly different except for ambarella jam formulated with stevia powder. Fructose, sucrose and maltose content for all types of analyzed jams with different formulations were not statistically significant ($p > 0.05$). The total sugar of analyzed ambarella jams were not statistically significant except for ambarella jam formulated with stevia powder. Sensory evaluation showed that consumers preferred ambarella jam formulated with *cocos nucifera* than other formulations. In conclusion, *cocos nucifera* is recommended to substitute or replace white sugar in the development of ambarella jam.

C05 Determination of total phenolic content, total flavonoid content and antioxidant activity in the mixture of stingless bee honey (*madu kelulut*) with garlic, cinnamon, lemon and ginger

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Madu kelulut is well known to have a lot of medicinal effect on human body. This study was conducted to determine the total phenolic content (TPC), total flavonoid content (TFC) and antioxidant activity in the mixture of stingless bee honey (*madu kelulut*) with garlic, cinnamon, lemon and ginger using aqueous extraction. Total phenolic content of the samples were determined using Folin-Ciocalteu assay while total flavonoid content were determined using aluminium chloride colorimetric assay. Antioxidant activity were carried out using 2, 2 -diphenyl-1- picrylhydrazyl (DPPH) radical scavenging assay and Ferric Reducing Antioxidant Power assay (FRAP). The results from this study show that honey cinnamon have the highest TPC (549.78±55.83 mg GAE/kg), TFC (97.93±22.61 mg RE/ kg), FRAP value (2186.20±1069.38 mmolFe^{+2} /g) and lowest DPPH IC_{50} value (12.17±0.15 mg/mL) which indicated highest antioxidant activity respectively compared to the other samples. Pearson correlation test demonstrated that there was very strong relationship between total phenolic content with DPPH IC_{50} value (r= -0.997) and FRAP value (r = 0.907). Total flavonoid content also reveals that there was medium relationship between TFC and FRAP (r =0.543) and strong relationship between TFC and DPPH IC_{50} value (r = -0.777). This results indicate that the total phenolic and total flavonoid were highly contribute to the significantly of the antioxidant activity. In conclusion, honey cinnamon showed the highest total phenolic content, total flavonoid content, FRAP value and lowest DPPH IC_{50} value which indicates the highest antioxidant activity.

C06 Dietary estimation of aflatoxin M1 exposure in urine as compared to aflatoxin databases among residents in Hulu Langat, Selangor

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Aflatoxin are highly toxic secondary metabolites produced by the *Aspergillus flavus* and *Aspergillus parasiticus* which had been classified as group one carcinogen by the International Agency for Research on Cancer (IARC) that can lead to liver cancer. Aflatoxin M1 (AFM1) is the hydroxylated metabolite produced from human and animal metabolism of AFB1 and mainly present in urine, milk and blood. Previous studies on aflatoxin occurrence in foods usually being analyzed through ELISA, TLC and HPLC. This study was conducted to determine the accuracy of the food database to estimate the AFM1 level in food products and compare it to the AFM1 level in urine which was determined through the ELISA kit. The data for this study were secondary data from a previous study conducted from March 2016 to July 2016. The aflatoxin level in dietary intake on cereal, eggs, nuts and milk consumption were quantified by using the food database from previous studies. Results showed that lower level of AFM1 was quantified through urine compared to through the food databases and the difference was significant (p<0.001). There are also significant differences in the aflatoxin level quantified through the food databases and urinary AFM1 based on food groups; cereals (p<0.001), eggs (p<0.001), nuts and legumes (p<0.001), and milk (p<0.001). It was found that the mean of the aflatoxin as quantified through the food databases was higher as compared to the urinary AFM1 with aflatoxin level range from -0.37 to 5.34 ng/ml. This study shows that food databases can provides a good estimation of aflatoxin exposure in human body through the dietary intake of foods although it is incomplete and only cover four food groups which are cereals, eggs, nuts and legumes, and milk.

C07 Inhibitory effect of brewers' rice (*temukut*) on α-amylase and α-glucosidase activity

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Brewers' rice also known as *temukut,* is the mixture of rice by-product such as rice bran, rice germ, broken rice and rice chip. It contains many bioactive compounds such as vitamin E, phenolics, γ-oryzanol, and phytic acid which have potential in prevention of diseases. With diabetes mellitus is becoming world health problem and having issue on drug-treatment exert adverse side effect to individual, thus alternative treatment of diabetes mellitus is needed. Hence, this study conducted to investigate the potential inhibitory effect of brewers' rice extract on α-amylase and α-glucosidase activity as anti-hyperglycemic agent. There were two extractions prepared from brewers' rice which were aqueous and 75% of ethanol extract. The α-amylase activity was examined by dinitrosalicylic acid (DNS) assay while α-glucosidase was determined by measuring the yellow-colored paranitrophenol released

from p-nitrophenyl glucopyranoside (pNPG). The acarbose used as positive control. The ethanol extract of brewers' rice is significantly the highest inhibited of α-amylase activity at IC_{50} (25.33±1.57 μg/mL) compare water extract. Whilst α-glucosidase activity, the water extract has the highest IC_{50} (2849.21±118.91 μg/ml) compare ethanol. In present study, brewers' rice extract shown the significant comparable with acarbose and has potential inhibitor for carbohydrate hydrolyses enzyme. These might help or prevent the postprandial hyperglycemic among individual with diabetes mellitus. An extensive study on specific bioactive compounds in brewers' rice that may contribute in inhibition of carbohydrate hydrolyses enzyme and *in vivo* studies might provide clearer and enhance understand of the mechanism on controlling blood glucose level.

C08 Antioxidant properties of fresh and frozen peel of lemon, key lime and musk lime as a potent source of antioxidant

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Citrus belong to family *Rutaceae* appear as promising sources of beneficial components as it contains high phenolic and flavonoid compound. However, citrus peel often being discarded as waste which contain high polyphenol and believed able to protect from chronic diseases. The freezing process may offer better antioxidant yield, polyphenol content and activity based on previous literature. This study aimed to determine antioxidant content and activity of fresh and frozen selected citrus peels. Frozen and fresh peels of lemon, key lime and musk lime were subjected to Folin-Ciocalteu reagent for phenolic content (TPC) determination and aluminium chloride calorimetric assay for total flavonoid content (TFC) determination. The antioxidant activity determined by DPPH free radical scavenging activity assay and ferric ion reducing antioxidant power assay (FRAP). The TPC of frozen samples were significantly higher than fresh samples (p<0.05) and ranged from 72.01±0.67mgGAE/g to 136.48±0.58mgGAE/g. Similarly, TFC were also significantly different (p<0.05) ranging from 50.51±1.36mgQE/g to 178.32±2.13mgQE/g. The EC_{50} values obtained from DPPH free radical scavenging assay ranged from 0.823±0.1mg/ml to 3.16±0.92mg/ml with frozen citrus peels having a lower value indicating its higher antioxidant activity as compared to the fresh citrus peels. Furthermore, frozen citrus peels exhibited higher value in FRAP assay compared to fresh citrus peels sample that range from 0.38±0.003mMFe^{2+}/g to 0.53±0.009mMFe^{2+}/g with significant different between the fresh and frozen citrus peel samples (p<0.05). For Pearson correlation, there is no correlation between DPPH with TPC and TFC. However, there is positive correlation exist between FRAP with TPC and TFC (r=0.783, r=0.681, respectively). Overall, the present study showed frozen citrus peels possess higher antioxidant activity and content compared to fresh citrus peels. Suggesting frozen citrus peel as more potent source of natural antioxidant.

C09 Proximate composition and total phenolic content (TPC) in spelt (*Triticum Spelta*) bread and spelt flour

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Spelt *(Triticum aestivum* ssp. *spelta*), is a primitive crop grown in the oldest time about more than 6000 years ago. Despite high in mineral, antioxidant and protein, it also low in

gluten and FODMAP. Low FODMAP food was suitable as dietary management for Irritable Bowel Syndrome (IBS) people. The samples used were spelt flour, spelt bread baked for 30 and 45 min with the same temperature (220°C). The AOAC International method was used which was Dry-ashing (ash), Air-oven (moisture), Kjeldahl (protein), Soxhlet (fat) and Clegg-anthrone (total available carbohydrate), while Folin-Ciocalteau was used for TPC. The results were reported as mean±standard deviation with level of significance (p<0.05). The Independent t-test was performed to compare mean of both breads. Spelt flour has 13.22% moisture, 0.76% ash, 83.33% total available carbohydrate, 1.67% fat, 14.05% protein and 90.96% TPC. Between both breads, Bread A has higher moisture (38.42%±0.00) and fat (0.33%±0.07) compared to Bread B (moisture: 33.90%±0.36; fat: 0.19%±0.00), while, Bread B has higher ash (1.79%±0.02), total available carbohydrate (66.64%±3.20) and TPC (62.12%±10.74) compared to Bread A (ash: 1.42%±0.07; total available carbohydrate: 58.60%±1.70; TPC: 47.10%±4.14). Both Bread A and B has similar protein content which was 14.93%±0.46 and 14.92%±0.34 respectively. The significant difference of baking duration was observed in ash (p<0.01), moisture (p<0.01) and total available carbohydrate (p=0.02). However, there was no significant difference of baking duration with protein (p=0.10), fat (p=0.11) and TPC (p=0.09) between both spelt breads. Thus, bread baked with longer baking duration has lower moisture and fat, higher ash (mineral), total available carbohydrate and TPC.

C10 Total antioxidants activity, total phenolic content and total flavonoid content of *Polianthes tuberosa* (*sedap malam*) and *Ruellia tuberosa* (*gempur batu*) leaves

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Studies related to antioxidants are common in plant. Both *Polianthes tuberosa* and *Ruellia tuberosa* have been used as traditional remedy. However, limited study could be found on total phenolic content, total flavonoid content and total antioxidants activity of these plants. This study was carried out to determine and evaluate total phenolic content, total flavonoid content and total antioxidants activity of leaves for *Polianthes tuberosa* and *Ruellia tuberosa* in water and ethyl acetate extracts. The total phenolic and flavonoid contents of the plant extracts were determined by using Folin-Ciocalteau and aluminium chloride colorimetric assays. The antioxidant activities of the plant extracts were evaluated using DPPH free radical scavenging assay and Ferric Reducing Antioxidant Power (FRAP) assay. The water leaves extract of *Polianthes tuberosa* was found to possess the highest total phenolic content (3.6±0.00 mgGAE/gDW) while the ethyl acetate leaves extract of *Polianthes tuberosa* was found to possess the highest total flavonoid content (1.06±0.00 mgQuer/gDW). The water leaves extract of *Polianthes tuberosa* possessed the highest radical scavenging activity, with IC50 of 0.79 mg/ml and exhibited the highest reducing power (22.34±0.00 mmol Fe2+/g). A strong negative correlation was found between total phenolic content and DPPH, while for the correlation between total phenolic content and FRAP, a strong positive correlation was found. For the correlation between total flavonoid content and DPPH, a weak positive correlation was found but the result was not significant. While for the correlation between total flavonoid content and FRAP, a strong negative correlation was found. It can be concluded that *Polianthes tuberosa* leaves had better antioxidant activities compare to *Ruellia tuberosa* leaves. This finding indicates that both *Polianthes tuberosa* and *Ruellia tuberosa* could serve as natural source of antioxidants.

C11 Proximate compositions and total sugar content of sugarcane (*Saccharum Officina•°rum L.*) peel and bagasse

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Sugarcane (*Saccharum Officinarum L.*) is known as one of the major sources of sugar and mainly planted in subtropical and tropical area. The sugarcane wastes such as peel and bagasse provide wide range of benefits. Besides, they can be used as a potential supplement in food ingredients for their nutritional value. Although the nutritional composition of sugarcane bagasse can be found in the literature, little is known on the sugarcane peel. Hence, this study was conducted to determine and compare the proximate compositions and total sugar content of these sugarcane wastes. Sugarcane peel and bagasse were acquired from a sugarcane juice vendor in Kajang, Selangor. Then, they were washed, freeze-dried, homogenized and analysed for the nutrient contents. For the moisture content, oven-drying method was used (105°C; 36h) and dry ashing technique with a furnace was used to determine the ash content. Kjeldahl method and soxhlet extraction method with petroleum ether were used to analyse protein and fat contents, respectively. The total dietary fibre (TDF) was determined based on the AOAC 985.29 method, and carbohydrate was calculated by difference. Lastly, total sugar was determined by using acid hydrolysis method. The fat content was significantly difference ($p=0.03$) between the samples, where its content in the peel (1.72±0.88%) was significantly higher than in the bagasse (0.67±0.14%). However, other nutrients and total sugar content were not significantly different ($p>0.05$) between the peel and bagasse. Although not significant, both samples were found to have relatively high TDF [Peel=63.22±2.27%; Bagasse=63.10±0.76%). These findings indicated that the sugarcane's nutrient compositions are not much different by its part of the plant. Both sugarcane bagasse and peel are agro-industrial by-products that can be a good source of dietary fibre. Besides, they can be further explored as a potential source of nutraceuticals and functional foods.

C12 Determination of amylose, amylopectin, resistant starch and total starch in papaya at different ripening stages

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Adequate intake of fruits is essential for good health. Even so, only 6% of adult Malaysians consumed sufficient intake according to National Health and Morbidity Survey (NHMS) 2015. Growing evidences showed there is a change in the starch composition of fruits during the ripening process. However, evidences for papaya are limited. The objective of this study was to determine the amylose, amylopectin, resistant starch and total starch contents in papaya at unripe, semi-ripe and fully ripe stage. Papaya (*Sekaki*) was purchased and followed throughout the ripening stages, from unripe to fully ripe. UV-spectrophotometry was used in the analysis of amylose and amylopectin contents and the ratio was collected. The proportion of resistant starch and total starch were determined using commercially assay kit. At each ripening stage, three replicates were taken for every analysis. All data were analyzed using Statistical Package for Social Sciences (SPSS). ANOVA, Tukey and Dunnett's T3 test were used in analyzing the data. The content of amylose and amylopectin in papaya decreased from 1.02 to 0.42 g/100 g and 1.15 to 0.56 g/100g, respectively. Significant difference was found between unripe and semi-ripe stage ($p<0.05$) for the decline in both amylose and amylopectin, but no significant difference between semi-ripe and fully

ripe stage (p>0.05). There was a significant difference in the ratio of amylose to amylopectin between unripe and semi-ripe papaya (p<0.05). The decline in resistant starch content of papaya differs significantly only between unripe and semi-ripe stage, with p<0.05. No significant difference was found for the total starch content of papaya at different ripening stages. The amylose, amylopectin, ratio of amylose to amylopectin, resistant starch and total starch contents were highest in unripe papaya among three ripening stages. Unripe papaya could be recommended to individuals who are concerned about their blood sugar levels.

C13 Effect of cooking methods (conventional rice cooker and draining method) on amylose, amylopectin, resistant starch and total starch content of selected brown rice

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Rice (*Oryza sativa* L.) is considered as energy dense and staple food in Malaysia. The fame of consuming brown rice keeps increasing due to the low glycaemic index (GI) value. The GI value is contributed by the different contents of amylose (AM), amylopectin (AP), resistant starch (RS) and total starch (TS) content. Studies shown that brown rice that consists high levels of RS and AM is able to lower down the GI value. Moreover, studies have shown that cooking methods of brown rice contributed to the variation of the starch components. However, the comparison of the effect of conventional rice cooker and draining methods on AM, AP, RS, and TS content in brown rice has not been reported. The objective was to compare the AM, AP, RS and TS content in brown rice using 2 different cooking methods (conventional rice cooker and draining method). The cooked brown rice (CBR) was freeze dried to remove moisture content. The determination of AM and AP was done by using Iodine-Binding Assay. RS and TS were determined using Megazyme Kit. The result shown that both AM (48.96±0.13g/100g, p<0.001) and AP (67.52±1.36 g/100g, p=0.002) content in CBR from conventional rice cooker were higher than draining method. However, the RS content in CBR from conventional rice cooker (0.74±0.13g/100g) and draining method (0.75±0.13g/100g) made no significant difference (p=0.871). Lastly, the TS content in cooked brown rice was significantly lower in conventional rice cooker compared to draining method (p<0.001). In conclusion, RS shown no significant effect from both cooking methods but AM, AP and TS. With the consideration of AM and TS, cooking rice with conventional rice cooker method is recommended to diabetic population as it retains greater amount of AM which can offer a better control of post-prandial blood glucose.

C14 Effect of extraction solvent on antioxidant capacity, total phenolic and flavonoid contents of *Cleome gynandra*

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Cleome gynandra is considered as an underutilized vegetable in Malaysia which is used as local source of foods and medicines. Antioxidants of natural origin can scavenge free radicals and limit their effects on cell damage. This study was carried out to evaluate antioxidant

capacity, total phenolic and flavonoid contents using different solvent types. There were three types of extraction solvents used which were water, 70% ethanol and 80% methanol. DPPH free radical scavenging, Ferric ion reducing antioxidant power (FRAP) and Oxygen radical absorbance power (ORAC) assays were used for determination of antioxidant capacity. Folin-Ciocalteu and aluminium chloride colorimetric methods were used to determine total phenolic content (TPC) and total flavonoid content (TFC) respectively. In scavenging activity, 70% ethanol (652.99±4.88 μg/ml) had showed the lowest EC_{50} value, indicating the highest (p<0.05) antioxidant capacity compared to 80% methanol (860.17±3.64 μg/ml) and water (1076.48±12.85 μg/ml). 80% methanol (27.66±5.94 mM Fe^{2+}/g DW) showed the highest value of FRAP compared to 70% ethanol (20.26±1.27 mM Fe^{2+}/g DW) and water (10.66±1.85 mM Fe^{2+}/g DW). 80% methanol also had the highest value (354.78±41.78 μmol TE/g DW) based on ORAC method. The findings showed 80% methanol had the highest total phenolic content (3.09±0.19 mg GAE/g DW) while 70% ethanol possessed the highest total flavonoid content (2.38±0.09 mg QE/g DW) compared to other solvent types. EC_{50} of DPPH radical scavenging activity and ORAC value were highly correlated with TPC and TFC. Overall, most suitable solvent type for DPPH radical scavenging activity and TFC was 70% ethanol while for FRAP, ORAC and TFC was 80% methanol. The study indicated a great potential of *Cleome gynandra* as a natural source of antioxidant.

C15 *In vitro* determination of antioxidant content in Malaysian stingless bee propolis using WIL2-NS cells

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Propolis is a natural bee product that had been used as medicine all around the world for a long time. Malaysian propolis contains several active ingredients such as phenolic acid and flavonoid that could be a potential antioxidant supplement. This study was designed to determine the antioxidant content of Malaysian propolis from *Trigona thoracica* and its effect towards WIL2-NS cells. Both FRAP assay and *in vitro* FRAP assay were used to determine the antioxidant content and it was found that the antioxidant content of propolis was directly proportional to the concentration whereby each concentration showed significant difference with p<0.05. On the other hand, DPPH assay was used to determine radical scavenging activity of propolis in which similar concentration dependent trend was observed but with no significant difference (p<0.05) at concentration 12.5 μg/ml. There was a positive correlation (p<0.001) between all 3 assays in which strong relationships were found between FRAP assay and DPPH assay (r = 1.00) as well as FRAP assay with *in vitro* FRAP assay (r =0.996). These indicated that high antioxidant contents result in stronger radical scavenging activity. It was concluded that Malaysian stingless bee propolis from *Trigona thoracica* had high antioxidant content and strong radical scavenging activity at high concentration.

C16 Determination of amylose, amylopectin, resistant starch and total starch contents in guava at different ripening stages

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The objective of this study was to determine the amylose (AM), amylopectin (AP), ratio of amylose to amylopectin (AM : AP), resistant starch (RS) and total starch (TS) contents in

guava at different ripening stages. This experimental study was conducted in research laboratory of IMU. A total of 16 kg of unripe, white-fleshed guava was purchased in Kuala Bikam, Perak. They were followed up through the three stages of ripening (unripe, semi-ripe and fully ripe) accordingly. The dried samples were obtained through freeze drying method. AM and AP content were analysed by using UV-spectrophotometer. The contents of RS and TS were measured by using a commercially assay kit according to AOAC Official Method 2002.02. The AM and AP content showed no significant difference at different ripening stages of guava ($p>0.05$). The AM : AP of guava at unripe and semi ripe stage were significantly higher than fully ripe stage ($p<0.05$) while no significant difference had shown between unripe and semi ripe stage ($p>0.05$). The RS contents of guava decreased significantly from unripe to semi ripe and fully ripe stage ($p<0.05$) while there was no significant difference between semi ripe and fully ripe stage ($p>0.05$). A significant increase in the TS content of guava was observed from the unripe stage to the semi ripe stage ($p<0.05$). The TS content significantly decreased from semi ripe to fully ripe stage ($p<0.05$). A significant effect of different ripening stages on AM : AP, RS content and TS content in guava was obtained. However, there was no significant effect of different ripening stages on AM and AP content of guava. The consumption of guava at unripe stage should be recommended to general public especially diabetics patients as it had the highest RS content among the three ripening stages.

D: Clinical Nutrition/Intervention Trials

D01 The effects of prebiotic fiber on bone health among prepubertal kids (PREBONE-Kids) – a study protocol

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Prepubertal is a critical period for optimal calcium intake in order to achieve peak bone mass. Malaysian children of this age group consume only 30-50% of their calcium requirement. Short-term studies have demonstrated that soluble corn fibre (SCF) increases calcium absorption in adolescents which was correlated with specific beneficial gut bacteria. The PREBONE-Kids study aims to investigate the effects of SCF supplementation on bone indices in 9-11-year-old prepubertal boys and girls (n=243) who will be recruited from primary schools in Kuala Lumpur. This study is a double blind, randomized, parallel design trial incorporating SCF (12 g fiber/day) into the diet alone and in combination with 600 mg added calcium compared to added calcium alone at 600 mg and a placebo group (no fiber, no added calcium) for 12 months via flavoured water. The primary outcomes are BMD & BMC and secondary outcomes are bone markers (CTX1, P1NP, osteocalcin & BAP) and body composition. Invitation to participate were sent to 1293 primary school children and currently 243 subjects have been enrolled into the study. The PREBONE-Kids Study is a novel study to demonstrate whether SCF's ability in increasing calcium absorption translates into a long-term effect on bone accrual in prepubertal children achieving peak bone mass. The study protocol is also designed to test the effects of SCF in a calcium replete and deplete condition. This paper will present the progress of the study and the baseline characteristic of the subjects in this study. Research funding and support are provided by Tate and Lyle Health & Nutritional Sciences.

D02 Association between fruits and vegetables intake and body mass index (BMI) among cardiovascular disease patients in Hospital Universiti Sains Malaysia (HUSM)

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Cardiovascular disease (CVD) can be described as a group of disorders that affect the heart and blood vessels which include coronary heart disease or ischemic heart disease, cerebrovascular disease, congenital heart disease, peripheral vascular disease and heart rhythm problem or arrhythmias. The aim of current cross-sectional study was to investigate fruits and vegetables (FV) intake with recommended serving size achievement among CVD patients in HUSM. A total of 118 CVD patients were recruited from medical wards such as 7S, 7U and 8S, surgical wards like 1S and 3U and coronary care unit which is 1F in HUSM based on the inclusion criteria. Study subjects were selected through purposive sampling technique. Anthropometric and socio-demographic questionnaire was designed to collect the anthropometrics measurements and socio-demographic data whereas FV intake of each study subject was assessed through semi-quantitative food frequency questionnaire (FFQ). Current findings depicted that CVD patients were overweight based on Asian BMI classification with median BMI of 23.7 kg/m². The median for daily serving size of FV intake of study subjects were 1.95 serving size and 1.6 serving size respectively which were lower than the recommended serving size for FV by World Health Organisation (WHO) (2003). Only males were able to achieve daily fruits recommendation which is ≥2 serving size every day. Both males and females failed to fulfil recommended vegetables serving size achievement. Meanwhile, fruits intake of male was significantly different to the fruits intake by female (p=0.025). Nonetheless, there was no significant association demonstrated between both fruits serving size achievement and BMI as well as vegetables serving size achievement and BMI.

D03 Associations of dietary eating practices on glycemic control and quality of life of diabetic patients in Hospital Universiti Sains Malaysia (HUSM), Kelantan

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Type 2 diabetes mellitus is a chronic disease worldwide, described as elevated level of blood sugar known as glucose which results in the state of hyperglycemia. This is due to defects in insulin secretion or insulin action, or both. The aim of current cross-sectional study was to examine the associations of dietary eating practices on glycemic control and quality of life of patients with type 2 diabetes mellitus in HUSM, Kubang Kerian, Kelantan. A total of 111 type 2 diabetic patients in HUSM were recruited in this study. Study subjects who met the inclusion criteria were selected through purposive sampling technique. A questionnaire-based interview was used to collect data on sociodemographic, health history, dietary eating practice, quality of life and semi-quantitative food frequency questionnaire (FFQ). Anthropometric measurements and related biochemical data were also taken. Current study reported that there are no association between dietary eating practice and glycemic control as result showing ($p > 0.05$). Similar findings were reported in association between

food group intake and glycemic control ($p > 0.05$). Out of 111 respondents, 49.5% have good quality of life and 50.5% have poor quality of life. The relationship between dietary practice and quality of life shows no significant relationship. Significant correlation between food group and quality of life only reported in three food items, wholemeal bread ($p= 0.001$), pear ($p = 0.02$), cakes ($p = 0.02$) and ice cream ($p = 0.01$). In conclusion, current study found there are no association between dietary eating practice on glycemic control and quality of life. However, there is association between glycemic control and quality of life.

D04 Consumer acceptance study on weight management soy protein drink among overweight and obese adults

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Growing trend of worldwide obesity urges the needs of functional food for weight management. Thus, current study formulated a weight management drink by incorporating white kidney bean extract, green coffee bean, Garcinia cambogia and green tea extract and study the consumer acceptance for a month consumption. The consumer acceptance survey was assessed by food action rating scale. General health assessment was determined by Short Form SF-36, Gastro Intestinal Tract (GIT) questionnaires. Eating behaviours questionnaires were determined by Adult Eating Behaviour Questionnaire (AEBQ) and Self-Regulation Eating Behaviour Questionnaire (SREBQ). Anthropometry assessment were recorded at baseline, week 2 and week 4. 20 overweight or obese based on WHO criteria was recruited and randomly assigned to A group (sample containing active ingredients); and B group (sample without the active ingredients). In term of consumer acceptance, there is no significance difference between baseline and at 4th week of consumption. After 4 weeks consumption , significant different was observed in social functioning($p<0.05$) and constipation ($p<0.05$) in Group A. There is significant increase in energy/fatigues ($p<0.05$) for SF-36 in group A . In term of eating behaviours, group A showed significance decrease in enjoyment of food ($p<0.05$) and emotional over-eating ($p<0.05$); meanwhile there is significant increase in slowness in eating in AEBQ ($p<0.05$). In addition, group A showed significant decrease in body weight ($p<0.05$), Basal Metabolic Rate ($p<0.05$) and BMI ($p<0.05$)at 2nd week. In contrary, group B showed no significance difference at all parameters. In conclusion, functional drink incorporating white kidney bean extract, green coffee bean, Garcinia cambogia and green tea extract seems to have the weight management potential as suggested in previous study, however, further study is warrant before any definite conclusion can be made.

D05 "Healthy Without Frailty" program to prevent frailty and adverse outcomes: a protocol of an intervention study involving urban poor pre-frail elderly

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Frailty is a common syndrome among community-dwelling elderly and have been associated with serious adverse health effect. Previous studies found that a multi-domain intervention was feasible and effective in preventing frailty and its consequences among frail elderly. However, little is known about the effectiveness of the intervention among

pre-frail elderly in Malaysia. This study aims to develop, implement and evaluate the effectiveness of a multi-domain intervention namely "Healthy Without Frailty" program targeted at both improving the degree of frailty and the outcomes among Malaysian pre-frail elderly in urban poor setting. This quasi-experimental study will evaluate both exercise and nutrition intervention for pre-frail elderly (60 years and above) residing in People's Housing Project [Program Perumahan Rakyat (PPR) flats]. Two PPR flats will be assigned to either the intervention group (n=15) or the control group (n=15). The "Healthy Without Frailty" program will be complemented with a package consists of booklet, posters, elastic band and squeeze stress ball, along with physiotherapist and nutritionist to guide the participants during the 6-month intervention. Effects of the intervention will be measured at four points in time; at pre-intervention, mid-intervention, post-intervention and 3-months follow-up. Frail elderly are expected to increase in numbers over the coming years to accommodate the burgeoning ageing population. Findings from this trial will potentially provide valuable evidence to prevent frailty and adverse outcomes using multi-domain intervention among Malaysian pre-frail elderly from low-resource settings.

D06 Positive impact of educational booklets on cancer prevention towards knowledge on diet and physical activity among early adults

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Cancer is a major public health problem worldwide but knowledge and awareness on cancer prevention among Malaysian is still limited. Educational booklet is a common tool used in health education as it minimizes teaching time conducted by healthcare professional. The objective of this study is to determine the effectiveness of educational booklet on knowledge of diet and physical activity for cancer prevention among early adults. This study employed a cluster randomized trial study design. A total of 68 respondents from two cluster were involved in this study and all respondents filled in the baseline knowledge on cancer prevention questionnaire. The two clusters with each 34 respondents, were randomized into intervention group (IG) or control group (CG). IG received three series of educational booklets on diet, physical activity and healthy body weight for cancer prevention whereas CG received unrelated printed materials. A follow-up knowledge assessment was conducted on week-5 and statistical analysis was performed to look for significant changes on knowledge level at baseline and week-5 between IG and CG. The results of this study shows that, at baseline, majority (64.7%) of early adults in this study had low level of knowledge on cancer prevention. After five weeks from receiving the educational booklets as intervention, there was a significant difference (p<0.001) in the knowledge score of respondents in IG compared to respondents in CG with an increase of 10.6 (95% CI 4.6, 17.0) points as adjusted mean difference. The educational booklets have shifted the knowledge level from low to moderate level after five weeks among the majority respondents. As a conclusion, it was found that educational booklets have a positive impact and effective towards improving knowledge on diet and physical activity for cancer prevention among early adults. It is alarming that overall knowledge level on cancer prevention of the majority early adults was low and a simple act of providing them with educational booklets might increase the awareness and practice on cancer prevention.

D07 The effect of using different spoon sizes on postprandial glycaemia, hunger and satiety ratings in overweight and obese subjects consuming white rice

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Obesity has reached epidemic proportion globally, especially in Asian countries including Malaysia. The control of postprandial glycaemic response (PPGR) is particularly important in managing and preventing obesity as it regulates hunger and satiety. PPGR in itself is influenced by the amount of food consumed per mouthful and the meal duration which are in turn, related to the eating spoon sizes. Therefore, spoon sizes influence PPGR, hunger and satiety levels and subsequently caloric intake. This study aimed to compare the effects of using two different spoon sizes [5 ml teaspoon (TS) vs 10 ml dessertspoon (DS)] to consume white rice on PPGR, hunger and satiety ratings among overweight and obese subjects. In this crossover study, 15 overweight or obese subjects (11 males and 4 females, aged 20-25 years) were recruited. They were requested to conform to the study protocol on two different occasions (one test for white rice consumed using TS and one test for white rice consumed using DS). The portion of rice served contained 50 g available carbohydrate. Capillary blood samples of subjects obtained before (0 minute) and after (15, 30, 45, 60, 90 and 120 minutes) white rice consumption were analysed using Reflotron system. PPGR was analysed using integrated area under the curve (iAUC) for blood glucose (2h), peak blood glucose and time to reach peak blood glucose. A 100 mm visual analogue scale was also provided to the subjects to rate hunger and satiety levels before (0 minute) and after (30, 60, 90 and 120 minutes). There were no statistically significant differences in mean iAUC (TS vs DS=200.3±70.2 vs 192.8±77.6 mmol.min/L, p=0.561), mean peak postprandial blood glucose level (TS vs DS= 8.1±0.9 vs 8.1±1.1 mmol/L, p=0.995) and mean time taken to reach peak postprandial blood glucose level (TS vs DS= 46.3±16.3 vs 46.3±11.9 min, p=0.850) between TS and DS used for white rice consumption. The two hours postprandial mean hunger (p≥0.392) and satiety ratings (p≥0.427) after white rice consumption were not significantly different between the spoon sizes used. Hence, consuming white rice by using different spoon sizes had no significant effect on PPGR, hunger and satiety ratings among overweight and obese subjects.

D08 The effect of using different spoon sizes on postprandial glycaemia, hunger and satiety of overweight and obese subjects consuming brown rice

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Malaysia has an alarming rate of prevalence of overweight and obesity. Hence, measures to aid body weight management are necessary. Postprandial glycaemic response (PPGR) has shown to be associated with post-meal hunger and satiety. There is limited evidence to show that varying eating utensils can modulate post-meal PPGR, hunger and satiety. This study aimed to investigate the effect of changing eating spoon size on PPGR, hunger, and satiety among overweight and obese Malaysian adults when consuming brown rice. A total of 15 overweight/obese healthy adults were recruited in this crossover study. After an overnight fast of 10 hours, subjects were required to complete the test meals on two different occasions [1 test for brown rice using dessert spoon (DS), 1 test for brown rice

- using teaspoon (TS)]. Standardised brown rice meal on both occasions contained 50g of available carbohydrate (133g of brown rice). Capillary blood samples at seven time points (0, 15, 30, 45, 60, 90 & 120 min post-meal) were assessed using Reflotron® Plus system for blood glucose analysis. PPGR (including time taken to reach peak postprandial blood glucose level, peak postprandial glucose level, incremental area under curve (iAUC)) of the blood glucose response curve were calculated using Microsoft Excel. During the meal test, visual analogue scales was also used to estimate subjects' hunger and satiety at five time points (0, 30, 60, 90 & 120 mins). Peak postprandial glucose level was reached 11.2 min earlier after consuming same amounts of brown rice using DS vs TS [41.3±10.6 vs 52.5±24.1 mins, p=0.458]. Also, peak postprandial glucose level attained using both spoons was identical [DS vs TS: 7.5±0.7 vs 7.5±1.0 mmol/L, p=0.939]. Similarly, iAUC was not significantly different between DS and TS: (175.3±73.0 vs 175.4±54.4 mmol.min/L, p=0.997]. Accordingly, post-meal hunger and satiety scores also showed no significant difference when brown rice was consumed using DS and TS (all p>0.05, at all time points). Therefore, different spoon sizes used to eat brown rice did not have any significant impact on PPGR, hunger and satiety in overweight and obese Malaysian adults. Thus, using smaller eating spoons may not be effective to improve PPGR, hunger and satiety in this population.

D09 Impacts of nutrition education interventions on metabolic syndrome among adults: A systematic review

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Metabolic syndrome (MetS) can be described as a cluster of metabolic anomalies and cardiovascular risk factors that are present among individuals with impaired insulin sensitivity. With metabolic syndrome leading the twin global epidemics which are type 2 diabetes mellitus and CVD, there is an overpowering moral, medical and economic need to detect those individuals with metabolic syndrome at an early stage to provide appropriate interventions and treatment which may prevent the development of diabetes and cardiovascular disease The systematic review aims to review published literature pertaining to the impact of nutritional interventions among adults with metabolic syndrome. The literatures were accessed from three databases notably Science Direct, MEDLINE and Scopus. We initially identified a total of 40 articles, which met the inclusion criteria after the first screening process, and 16 articles, which met the selection criteria, were retained. The results of this systematic review revealed that nutrition education intervention improve dietary patterns and consequently led to the improvement of at least five risk factors of metabolic syndrome. Across the population studies observed within the screened and selected research articles, positive changes were noted majorly in terms of the following metabolic risk factors: waist circumference, HDL-cholesterol and triglycerides. The findings of this review support the fact that nutrition education intervention is a noteworthy strategy, which promotes behavioural changes and consequently improves cardio metabolic risk factors.

D10 The emotional experience of eating during hospitalisation in Malaysian public hospitals

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It is crucial to know how emotions affects food consumption, as it often leads to compromised food consumption and dissatisfaction with hospital food. The aim of this study was to determine the emotions experienced and to measure patients' satisfaction in relation to food consumption. The Acute Care Hospital Foodservice Patient Satisfaction Questionnaire (ACHFPSQ) and the PANAS questionnaire (which had five scale from *'very slightly or not at all', 'a little', 'moderately', 'quite a bit'* to *'extremely'* to indicate the extent they have felt related to both PA (positive affects) and NA (negative affects) were used. A total of 1106 patients from 24 public hospitals in Malaysia were included, whereby 43.8% (n=484) were males and 56.2% (n=622) were females. Most of them stayed 2-3 days (44.8%, n=496), followed by > 7 days (19.4%, n=215), 4-5 days (16.6%, n=184) and 1 day in the hospital (12.7%, n=140). Overall patients' satisfaction with hospital foodservice indicated that 42.4% (n = 469) rated hospital foodservice as 'okay', followed by 39.8% (n = 440) who rated as 'good', 8.8% (n = 97) rated as 'poor', 7.8% (n = 86) rated as 'very good', and only 1.3% (n =14) rated as 'very poor'. In terms of positive emotion, most of them felt enthusiastic, attentive and determined, while negative emotion includes afraid, jittery and distressed. There was no significant differences between emotion experienced and gender for PA (p=0.14) and NA (p=0.35). There was also no differences between emotion and length of stay for PA (p=0.13) and NA (p=0.37). However, there was significant relationship between patients' satisfaction and emotions PA for (p<0.05) and NA (p<0.00). Emotions experienced affects their satisfaction, hence factors inducing especially negatives emotions should be identified and reduced to ensure patients eat better.

E: Food Science & Technology

E01 Prebiotic potential of sugarcane (*Saccharum Officinarum L.*) agro-industrial by-products on the growth of probiotic

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Sugarcane (*Saccharum Officinarum L.*) is a widespread tropical plant valued for its nutritional and sensory characteristic. Around 70% of its raw material's weight such as bagasse and peel are considered as agro-industrial by-products with high nutritional value. This study aims to assess the prebiotic potential of sugarcane agro-industrial by-products on the growth of probiotic *Lactobacillus casei* strain Shirota (LcS) using an *in vitro* experimental model. Two parameters were assessed; the growth performance of LcS (log CFU/mL, final pH, mean growth rate and mean duplication time) and the prebiotic activity score. This experiment used sugarcane bagasse and peel as samples. These samples were freeze-dried, homogenized and the total sugar content was determined by using acid hydrolysis method. Then, the customized culture media was prepared by substituting glucose with sugarcane bagasse (MRSb) and peel powder (MRSp) in the same formulation (20 g/L) of MRS broth. Commercial MRS (cMRS) broth was used as a positive control. After 48 hours of fermentation, the LcS growth was significantly different (p<0.023) between the media. Further analysis indicated that the probiotic's growth in MRSp (8.60±0.35 log CFU/mL) was significantly different than in the MRS broth (9.31±0.28 log CFU/mL). The media's pH was reduced following the fermentation, but the final pH was not significantly different between MRSb (5.71±0.03), MRSp (5.53±0.70) and MRS (5.69±0.11), with an exception of cMRS (4.44±0.07). There was no significant difference on the mean growth rate (p>0.835) and the mean duplication time (p>0.469) of LcS, indicated that the probiotic growth was not affected by the source glucose in the media. Besides, the prebiotic activity scores of MRSb (0.23±0.01) and MRSp (0.18±0.01) are comparable with other agro-industrial by-products

reported in literature. From these findings, the sugarcane by-products are important functional ingredients for food industry due to their potential prebiotic and fermentable properties.

E02 The ability of leuconostoc fallax to ferment gum arabic (*Acacia Senegal* & *Acacia Seyal*) and inulin

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Lactic acid bacteria is the most investigated probiotics since decades. The uniqueness of LAB is that, they provide several health benefits as well as they are involved in food fermentations. The aim of the present study was to assess whether *leuconostoc fallax* be able to ferment inulin and the potential prebiotic (*Acacia senega*l and *Acacia seyal*). *Leuconostoc fallax* was screened of its ability to ferment prebiotics by using uncontrolled-pH batch cultures preformed with carbohydrate-free MRS broth. Results showed that *leuconostoc fallax*, could not ferment both *Acacia senegal* and *Acacia seyal* where it showed no significant increase in biomass or any significant drop in pH, whereas leuconostoc fallax was be able to slowly and significantly ferment the inulin and showed slight drop in pH and increase in biomass production up to 0.4 g/L at 48h of fermentation but after 48h there was no significant growth. These findings concluded that, gum arabic is hard to be utilized by *leuconostoc fallax*, whereas *leuconostoc fallax* got the efficiency to slowly or partly utilize inulin.

E03 Effects of drying method on the phenolic content and antioxidant activity of figs fruit

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The objective of this study was to study the effects of different drying methods (freeze-dried, hot-air-dried and microwave vacuum drying) on the phenolic content and antioxidant activity of *Ficus carica* fruit. The activities of several antioxidants were tested, including the total phenolic content (TPC), total flavonoid content (TFC), ferric reducing antioxidant power (FRAP) and 2,2-diphenyl-1-picrylhydrazyl (DPPH). Results showed that antioxidant activity and total phenolic content were affected by the drying methods. The data indicated that the freeze-dried sample had the highest total content of TPC, TFC and antioxidant activity (FRAP, DPPH and ABTS) 52,41 mg gallic acid/100g DW , 32.04 mg quercetin/100 g DW , 108.50 mg Trolox equivalents/100g DW and 72.81% respectively, while microwave vacuum drying samples had the lowest total phenolic content and antioxidant activity (TPC, TFC, FRAP and DPPH) 32.71 mg gallic acid/100 g DW , 21.16 mg quercetin/100 g DW , 69.10 mg Trolox equivalents/100 g DW and 40.11% respectively. The results indicate that properly dried *Ficus carica* fruit can be used as a good source of phenolic compounds and antioxidants activity.

E04 Determination of antioxidant activity and total phenolic content of sugarcane (*Saccharum officinarum* L.) bagasse and peel using aqueous and ethanol extractions

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Global production of agricultural wastes nearly reaches a billion tonnes yearly due to inability to recycle. Sugarcane (*Saccharum officinarum* L.) bagasse and peel are characterized as crop waste, among all other agricultural wastes, have high nutritional values and, potential nutraceuticals and functional foods. The objective of this study was to determine the antioxidant activity and total phenolic content of sugarcane bagasse and peel using aqueous and ethanolic extractions. Sugarcane peel and bagasse were obtained from a sugarcane juice vendor in Kajang, Selangor. Then, they were washed, freeze-dried, homogenized and analyzed for antioxidant activity and total phenolic content using 2,2-diphenyl-1-picrylhydrazyl (DPPH) radical scavenging assay and Folin-Ciocalteu method, respectively. The IC_{50} values were calculated in order to determine the antioxidant activity. Extraction of samples with ethanol (peel - 0.595 mg/mL; bagasse - 1.870 mg/mL) gave significantly (p<0.05) lower IC_{50} values than aqueous extractions (peel - 0.979 mg/mL; bagasse - 3.214 mg/mL). Moreover, the IC_{50} values also showed that, regardless of the extraction solvents, sugarcane peel had significantly lower IC_{50} values than bagasse. The Folin-Ciocalteu analysis showed that that aqueous extraction resulted in a higher total phenolic content for both sugarcane samples (peel - 0.832 mg GAE/g; bagasse - 0.354 mg GAE/g) compared to the extraction with ethanol (peel - 0.793 mg GAE/g; bagasse - 0.176 mg GAE/g). Regardless of the extraction solvents, sugarcane peel had significantly (p<0.05) higher total phenolic content than sugarcane bagasse. Overall, sugarcane peel has lower IC_{50} values (high antioxidant activity) and higher total phenolic content than sugarcane bagasse. Further studies are warranted to identify bioactive compounds in these agricultural wastes.

E05 Nutritional composition and textural properties of ready-to-eat compact rice developed from selected brown rice available in Malaysia

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Major dietary factor that can lead to overgrowth of metabolic syndrome within Malaysian population is lack of wholegrain intake. Degree of milling (DOM) of rice determines the rice yield, which is brown or white rice. However, brown rice is less preferred compared to white rice. Therefore, this study aims to investigate nutritional composition and textural properties of ready-to-eat compact rice developed from selected brown rice available in Malaysia. Compact brown rice able to be produced from three different varieties of brown rice. When compared compact brown rice to compact white rice, compact brown rice contributes higher protein, higher fat (unsaturated fats), higher minerals and has lower carbohydrate. Compact brown rice from three different rice varieties are not able to

form a uniform-texture of desired compact rice due to its less stickiness property which cause poor ability of gelatinized starches to stick together therefore lead to form unsolid structure. Among the brown rice varieties, long grain brown rice has the similar hardness, adhesiveness, cohesiveness and gumminess compared to commercial compact rice. Based on sensory attributes, when compared to commercial compact rice, specialty brown rice shows insignificant difference in term of aroma, texture, taste and appearance attributes. Even though long grain brown rice is more similar to commercial compact rice in term of textural properties, specialty brown rice is more preferred as it might be influenced by its palatability and appearance attributes. Hence, specialty variety is the most suitable brown rice for development of compact rice. Further study is needed which focuses on different treatment of cooking methods in preserving beneficial nutrients with desired palatability.

E06 Total antioxidant contents and activities of non-irradiated and irradiated *Archidendron jiringa (Jering)* and *Archidendron bubalinum (Kerdas)*

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Natural phytochemicals protect human body system against free radicals that can damage intracellular structure of human body. The application of gamma irradiation become advantageous for antioxidant activities independently of dosages applied. *Archidendron jiringa* and *Archidendron bubalinum* have shown to have benefits as antioxidant sources. This study aimed to determine the total antioxidant contents and activities of non-irradiated and irradiated (3, 6, 9 & 12 kGy) of hot aqueous extracts of *Archidendron jiringa* and *Archidendron bubalinum*. Total phenolic content (TPC) was determined by Folin- Ciocalteu method while total flavonoid content (TFC) by aluminium chloride calorimetric method. Antioxidant activities were evaluated by ß-Carotene bleaching assay, Ferric-reducing antioxidant power (FRAP) and DPPH-radical scavenging assays. Results showed *Archidendron jiringa* contained high TPC values in most of irradiated extracts (3kGy,6kGy,9kGy & 12kGy) while *Archidendron bubalinum* accounted in non-irradiated extract (2517.07±15.81 mg GAE/ g extract).TFC was found the highest level in irradiated extracts at 12kGy for *Archidendron jiringa* (620.00±8.70 mg QE/ g extract) and *Archidendron bubalinum* (448.99±5.02 mg QE / g extract. The highest scavenging activity using DPPH was found in irradiated *Archidendron jiringa* and *Archidendron bubalinum* at 6kGy.The highest ß-carotene bleaching activity was found in irradiated extracts at 12kGy for both of plants. FRAP values indicated *Archidendron jiringa* had highest reducing power in non-irradiated extract (1.73±0.18 mmol Fe^2/ g dry weight) while *Archidendron bubalinum* demonstrated at 12kGy (2.55± 0.40 mmol Fe^2/ g dry weight) Strong positive correlation (p<0.01) was found between TPC and TFC with FRAP for *Archidendron jiringa* and *Archidendron bubalinum.* Gamma irradiation induced antioxidant properties for both of plants as potential for natural antioxidant sources.

E07 Acceptance of low-sodium soup among primary school children in Klang Valley

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Excessive sodium intake is closely related to increase in blood pressure, and reduction of sodium intake can significantly lower systolic and diastolic blood pressure. Monosodium glutamate (MSG) is a flavour enhancer that can be used in low-salt food without increasing sodium content nor affecting the taste of food. The aim of this study was to determine acceptance of MSG-added, low-sodium potato soup among primary school children. The potato soup recipe was adapted to the children's preference. Sodium content in the potato soup was reduced to 30%, 40% and 50% from the initial recipe (0.2% of sodium). The potato soups were added with MSG (0.5%) and different amounts of salt which were 0.35%, 0.20%, 0.15% and 0.10%. Sensory evaluation of the four soups was done based on seven-point hedonic facial scale to determine the acceptance of low-sodium soup. Participants comprised 43 Malay, Chinese and Indian school children aged 9 to 11 years. Results showed no significant difference (p>0.05) in terms of colour, aroma, taste, saltiness, sweetness, creaminess and overall acceptance between the initial recipe and the reduced sodium potato soup recipes. Mean score for attributes such as saltiness (3.98±1.41), sweetness (4.05±1.27), creaminess (4.07±1.35) and overall acceptance (4.65±1.63) were highest in 30% reduced-sodium potato soup compared to the initial recipe and 40% and 50% reduced-sodium potato soup recipes. The initial recipe had the highest score for aroma (4.33±1.23) and taste (4.19±1.67) when compared to reduced-sodium soup recipes. In conclusion, reduction of sodium by 30% was possible with addition of 0.5% MSG. These findings suggest that low-sodium soup can be developed by reducing the amount of salt with addition of MSG without affecting the acceptance of the soup among primary school children.

E08 Comparison of physicochemical properties of three types of milk obtained from goat, cow and coconut (*santan*) in Malaysia

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Coconut milk is a common ingredient in Malaysian and Southeast Asian cuisines. It is commonly known locally as *santan*, usually its composition depends on the amount of water used for the extraction, which significantly affect the physicochemical properties. Therefore, this study was carried out to evaluate the physicochemical properties of Malaysian coconut milk sold by local vendors and compared with local goat and cow's milk. Fresh milk samples were analysed for physicochemical characteristics (protein, fat, moisture, ash, total solid and titratable acidity) according to standard procedures followed by AOAC. Results of the study showed that *santan* contained significantly higher (P<0.05) fat content (15.4%) than the goat's milk (5.1%) or cow's milk (5.6%) with lower moisture (73.1%) and total solid (9.6%). Although, the results indicated that coconut milk was the lower protein content (3.4%) nevertheless, it is a rich source of plant protein. *Santan* was also significantly higher (P<0.05) titratable acidity (0.38%) than goat and cow's milk (0.17 % and 0.23%), respectively. The study indicates that *santan* had proper physical properties and considered a good source of the plant protein where protein deficiency is frequently a problem because of the high cost of animal proteins.

E09 Development of alginate beads with grass jelly, *Luo Han Guo* and palm sugar as source of antioxidants

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Grass jelly, *Luo Han Guo* and palm sugar are commonly used in beverages and can be good sources of antioxidants which can prevent diseases such as coronary heart disease and cancer. As a practical carrier for the aforementioned ingredients, alginate beads were produced using the spherification technique. This method produces spheres with its walls being a thin gel on the outside while containing the liquid core. Hence, this project was intended to develop grass jelly, *Luo Han Guo* and palm sugar alginate beads, which is a healthier alternative to the tapioca balls in boba milk tea. Besides producing a bursting sensation in the mouth, the alginate beads are high in antioxidants content due to the aforementioned ingredients. Four different formulations of alginate beads (including the control) were subjected to acceptance testing. Consumer panellists chose alginate beads with 2:1:1 (grass jelly: *Luo Han Guo*: palm sugar), where this sample was subjected to physicochemical analyses. Results showed that alginate beads contained 77.91±0.08% moisture, 21.73% carbohydrate, 0.0014±0.00025 % protein, 0.02±0.02% fat, 0.33±0.05% ash and 252.89±14.13 mg/mL total sugar. The total energy content was 87.11 kcal/100 g. Alginate beads, which were subjected to DPPH assay for the evaluation of antioxidant activity, showed a percentage inhibition of 70.05±3.14, which was approximately 3 times higher than brown sugar, which was one of the main ingredients in 'boba'. Hence, these alginate beads can serve as a source of antioxidants.

E10 Bioconversion of isoflavones and growth characteristics of orally isolated putative probiotics in soymilk for orally-dissolving strip development

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Oral probiotics are commonly associated with the improvement of oral health as they act as a natural defence against cariogenic bacteria. Being proven by Food and Drug Administration (FDA) with the ability to reduce the risk of coronary heart disease in 1999, soy consumption has been seen to increase tremendously. As there is a significant link between oral health and systemic diseases, thus keeping a healthy oral is necessary for healthy living. Hence, this study aimed to investigate the possibility of engaging putative oral probiotics into soymilk to enhance the bioactive phytoestrogen content to be incorporated into orally-dissolving strip (ODS) for oral health improvement. Growth, pH, organic acid production, β-glucosidase activity and bioconversion of isoflavone in soymilk were compared between *Streptococcus salivarius* K12 (commercial oral probiotic) and *S. salivarius* TUCC 1255 after 24 hours of fermentation at 37°C. As a result, both strains reached 10^8 CFU/mL, decreased pH ($P < 0.05$), produced lactic and acetic acids ($P < 0.05$) and increased aglycone content ($P < 0.05$) by possessing β-glucosidase enzyme in fermented soymilk. *S. salivarius* TUCC 1255 has shown better growth ($P < 0.05$) and bioconversion ability to convert isoflavone glucosides to aglycones than *S. salivarius* K12 in soymilk. ODSs were developed using sodium carboxymethylcellulose (NaCMC) polymer, with the incorporation of the probiotic-fermented soymilk via solvent casting method. A 4cm x 2cm ODS containing 10^4 - 10^5 CFU/strip of live cells was formed. Our results indicated that the development of ODS could be a low cost, innovative and convenient vehicle for delivering oral probiotic and bioactive isoflavone to improve oral health.

E11 Effect of gum arabic on antioxidant compounds of papaya fruit during cold storage

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The present study was to investigate the effect of gum Arabic on flavonoids compounds (myricetin, quercitin and koempferol) and antioxidant activity of papaya fruits (*Carica papaya* L. cv Eksotika). Flavonoids compounds were detected by HPLC-DAD and antioxidant activity was determined by measuring total phenolic content (TPC), ferric reducing antioxidant power (FRAP), 2,2-diphenyl-1-picrylhydrazyl (DPPH). Gum Arabic in aqueous solutions of 5% and 10% was applied as edible coating to green-mature papaya and stored at 13°C±1 for 15 days. The result of the study showed that papaya fruits coated with 10% GA and stored for 7 days had significantly ($P<0.05$) higher flavonoids content (kaempferol, quercetin and myricetin) and antioxidants activity (TPC, FRAP and DPPH) than the sample control or other treated fruits. These results indicate that gum Arabic significantly influences the phenolic compounds and antioxidant activity in papaya fruit and improves the postharvest quality during cold storage.

E12 Influence of gum arabic on antioxidants activity and flavonoids (myricetin, quercitin and koempferol) of papaya fruit

***Zuhair Radhi Addai*[1], *Aminah Abdullah*[2] *and Sahilah Abd. Mutalib*[3]**

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The present study was to investigate the effect of gum Arabic on flavonoids compounds (myricetin, quercitin and koempferol) and antioxidant activity of papaya fruits (*Carica papaya* L. cv Eksotika). Flavonoids compounds were detected by HPLC-DAD and antioxidant activity was determined by measuring total phenolic content (TPC), ferric reducing antioxidant power (FRAP), 2,2-diphenyl-1-picrylhydrazyl (DPPH). Gum Arabic in aqueous solutions of 5% and 10% was applied as edible coating to green-mature papaya and stored at 13°C±1 for 15 days. The result of the study showed that papaya fruits coated with 10% GA and stored for 7 days had significantly ($P<0.05$) higher flavonoids content (kaempferol, quercetin and myricetin) and antioxidants activity (TPC, FRAP and DPPH) than the sample control or other treated fruits. These results indicate that gum Arabic significantly influences the phenolic compounds and antioxidant activity in papaya fruit and improves the postharvest quality during cold storage.

F: Experimental Nutrition

F01 The effect *Archidendron Jiringa* and *Sambiloto* intake in diabetes mellitus rats

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According to World Health Organization, Indonesia is ranked fourth according to the number of diabetes mellitus. Then, it could be 8.6% of total Indonesia population. *Archidendron jiringa* (*Jering*) and *Andrographis paniculata* (*Sambiloto/Hempedu Bumi*) is familiar in Indonesia as herbal medicine of diabetes mellitus because they contain alkaloid, flavonoid, and saponin. Saponin can increase homeostasis of glucose by rising sensitivity of insulin *in vitro* and *in vivo*. Previous study reported that saponin can increase accumulation of glycogen and decrease storage of triasigliseron in liver which is involved in increasing of insulin signal hepatic. In addition, the objective is to investigate glucose level of rats before and after alloxan induction. Then, to investigate the effective dose of *Jering* exstract and *sambiloto* in decreasing of glucose level in diabetes rat. This study was done at Natural Science Faculty, Department of Biology, Research of Physiology and Biota Laboratory, Andalas University. The design is Randomized Controlled Trail and was divided in six groups. These are without extraction and with dose 200 mg/kg and 400 mg/kg of *sambiloto* and *Archidendron jiringa* respectively. Glucose measurement was done by stripes. After that, data was analysed by descriptive analytic and novitiate. There was fluctuation of glucose during the first week, the second and the third week from 153 mg/dl, 165.4 mg/dl, and 156.4 mg/dl respectively because of alloxan intake. The result of extraction of 107 gram of *Archidendron jiringa* is 3.4 gram and 100 gram *sambiloto* is 2.5 mg. 200 gram/kg body weight can decrease 75 % glucose level of in 21st. There is significant decrease of glucose slowly from the fist, second and third week according to 200mg/kg body weight and 400 mg/kg body weight *sambiloto* and *Archidendron jiringa* intake respectively.

F02 Effects of diets with different composition of macronutrients on the production aflatoxin B_1 (AFB_1) biomarkers in AFB_1-induced rats

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Aflatoxin B_1 (AFB_1) is a food contaminant produced by fungi. The metabolism and production of AFB_1 biomarkers can be affected by diet and its component. In fact, its toxicity depends on how the toxin is metabolized in the liver. In this research, the effects of diets with different composition of macronutrients; high protein (HP), high carbohydrate (HC) and high fat (HF) diets on the circular production of serum AFB_1 and urinary aflatoxin M_1 (AFM_1) were determined in AFB_1-induced rats. Serum AFB_1 and urinary AFM_1 are metabolites of AFB_1 metabolism process in the liver. Sprague Dawley rats (n=32), aged 7-8 week's old were divided into four groups; Normal (N), HP, HC and HF diets. For a duration of 4 weeks, the rats were orally gavaged with 25μg AFB_1/kg body weight for 5 days/week. At the end of the experiment, serum and urine were collected for the measurement of AFB_1 biomarkers. Serum analysis showed that the amount of AFB_1 was significantly different between the diets (p<0.05), and the highest concentration was measured in rats fed with

HF diet (98.8±24.85 ng/mL), followed by N diet (88.12±10.65 ng/mL), HC diet (34.96±3.10 ng/mL) and HP diet (27.64±1.25 ng/mL). Conversely, rats fed with HP diet (5.22±0.28 ng/mL) had significantly higher urinary AFM_1 concentration ($p<0.05$) than rats fed with HC diet (1.00±0.36 ng/mL), HF diet (0.91±0.31 ng/mL) and N diet (0.04±0.02 ng/mL). From these findings, HF diet could enhance the toxicity effect of AFB_1, whereas the susceptibility of rats towards AFB_1 toxicity was reduced with the HP diet. The production of these biomarkers indicated that the activation and detoxification pathways of AFB_1 metabolism can be affected by the macronutrients' composition in the diet. Hence, the manipulation of dietary macronutrients has potential to shift AFB_1 metabolism towards the detoxification pathway and subsequently alleviate the toxicity effects of AFB_1.

F03 *In vitro and in vivo* studies on the ability of *Lactobacillus casei* Shirota as a potential aflatoxin B_1 adsorbent

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Aflatoxin B_1 (AFB_1) is the most toxic mycotoxin which frequently appear as food contaminant. Various preventive approaches have been developed, however, such methods pose risks to humans. Probiotic, *Lactobacillus casei* Shirota (LcS) is a potential AFB_1 adsorbent. In this study, the AFB_1 removal ability in both *in vitro* and *in vivo*, as well as microscopic changes of AFB_1-bound LcS, were assessed. *In vitro* study on AFB_1 binding indicated that the amount of AFB_1 removed by LcS was concentration-dependent. A theoretical model based on the Langmuir isotherm was applied to evaluate the binding efficiency of live and heat-treated cells of LcS, as well as its cell wall. The results indicated that the interacting force was the strongest between the AFB_1 and microorganism's cell wall and the live LcS cells. Scanning electron microscopic image revealed that AFB_1 induced structural changes on the bacterial cell surface, with rough and irregular surface along with a curve rod-shaped morphology. On the hand, *in vivo* experiment investigated the ability of LcS to bind AFB_1 and reduce AFB_1 biomarkers in serum and urine in AFB_1-induced rats. Sprague Dawley rats aged 7-8 week's old were divided into 2 groups ($n=8$): A, LcS (10^9 CFU)+AFB_1 and B, Saline+AFB_1 only. After 4 weeks of treatment with 25µg AFB_1/kg body weight for 5 days/week, the rats of group A had significantly ($p<0.05$) lower concentration of serum AFB_1 (49.6±8.05ppb) than the rats in group B (88.12±10.65ppb). Meanwhile, no significant difference was observed for aflatoxin M_1 (AFM_1) where the concentration of urinary AFM_1 was 0.0219±0.00ppb and 0.0388±0.02ppb in group A and B, respectively. Taken together, this preliminary study highlights the potential use of LcS as a preventive agent against AFB_1 contamination via its strong binding capability. Besides, LcS limits the AFB_1 absorption in the small intestine and reduces production of AFB_1 biomarkers.

F04 Cytotoxicity potential of local plant extracts against HK1 nasopharyngeal carcinoma cell line

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Traditional medicines almost always encompass plants in their treatment. This is because of a variety of properties in plants that are scientifically proven to be beneficial in treating certain types of illness. This study was conducted to assess selected local plants in Sarawak reported to have high antioxidant properties for their potential cytotoxic activities against HK1 nasopharyngeal cancer cell line. In addition, their synergistic or antagonistic activity was also assessed when combined with 5-fluorouracil, a common chemo drug. The plants used in this study were the young shoots of *Dillenia suffruticosa* (`simpoh air') and *Syzygium polyantha* (`daun bungkang'). Both are edible, the former commonly consumed as `ulam' and the latter as an aromatic ingredient in local dishes. The aqueous crude extracts of the freeze-dried powder of the plant shoots was prepared using distilled water at 37°C as the solvent. The extract solution was filtered, and the filtrate was made up to known volume before analysis. The extract solution was then diluted as needed before being added to HK1 cancer cells in 96-well plate. After 72 h incubation (37°C, 5% CO_2), the amount of viable cells in each well was then determined using MTS (3-(4,5-dimethylthiazol-2-yl)-5-(3-carboxymethoxyphenyl)-2-(4-sulfophenyl) -2H-tetrazolium) assay. Preliminary result of the screening suggested that both plant extracts possess some cytotoxic activities against HK1 cancer cells. Incubation of the cells in the presence of the plant extracts in combination of 5-flurouracil at different concentrations also suggested some level of synergistic effects.

Notes

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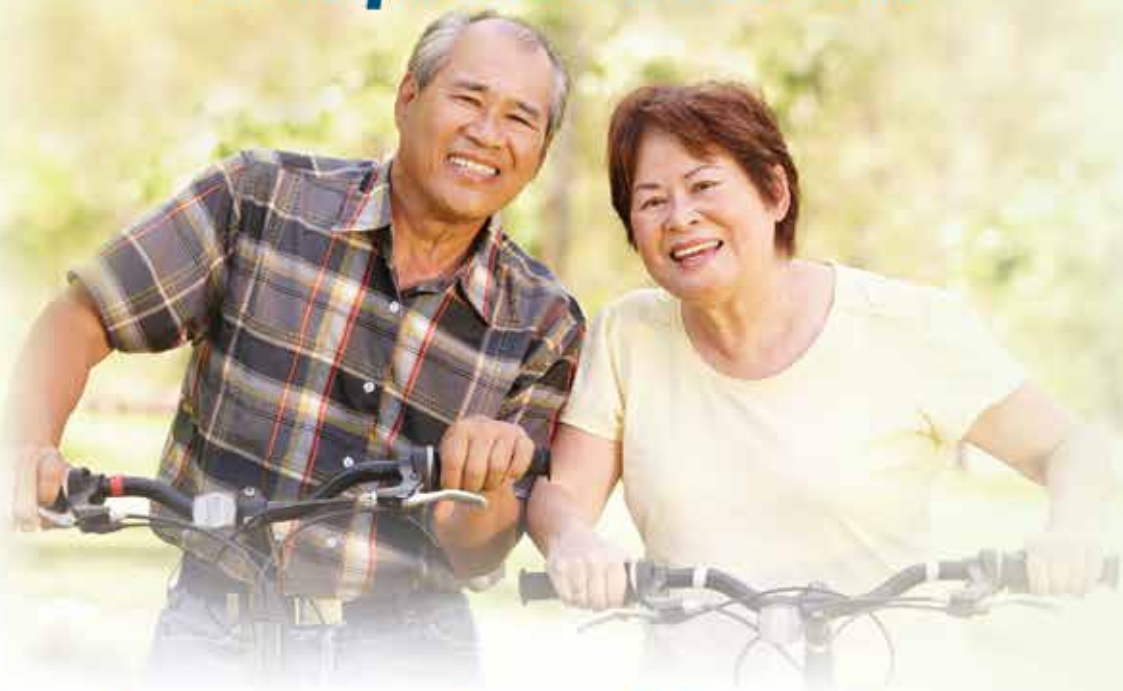

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