35th Scientific Conference

Theme

Together Towards Optimal Nutrition

Programme & Abstracts

24 – 25 November 2020

GoToWebinar Online Platform

Enfagrow A+ MIND PRO

TODAY builds TOMORROW

IMPROVED FORMULA

MFGM PRO

A complex bioactive compound found abundantly in brain to help support **cognitive development and fewer sick days**[1]

HIGHEST DHA▲

60% higher DHA▲

PREBIOTIC FOS◆

Prebiotics to help maintain **good gut environment**

No added sugar*

* Sugar refers to sucrose based on Regulation 118 under Malaysia Food Regulation 1985
▲ Compared to previous growing-up milk formulation (Year 2017).
◆ Fructo-oligosaccharide
1 Veeraman et al (2012). Nutrition 28 (7-8), 749 – 752. Veeramen study & behavioral is a sign of cognition : https://opentextbc.ca/socialpsychology/chapter/affect-behavior-and-cognition/

MYS-01/10P15/20297

Contents

Conference Secretariat

VERSACOMM (263773-W)

12-A, Jalan PJS 8/4, Mentari Plaza, Bandar Sunway,
46150 Petaling Jaya, Selangor.
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Email: versahealth@versa-group.com

Members of the 17th Council & Organising Committee of 35th Scientific Conference

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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 bid you a warm welcome to the 35th Annual Scientific Conference of Nutrition Society of Malaysia (NSM). We are unable to meet physically as planned due to the raging COVID-19 pandemic. However, our minds and ideas can still come together virtually. This virtual conference will continue to provide an opportunity to share updates on nutritional science through online oral and poster presentations. There is even a virtual trade exhibition!

Several cycles of nutrition action plans have been implemented to tackle the double burden of malnutrition in the country. Unfortunately, we have not fully achieved the various nutrition goals set. While undernutrition persists among selected groups, there is ample evidence (eg NHMS 2019) that the prevalence of non-communicable diseases (NCDs) and their associated risk factors have now reached alarming levels. With five years left to the termination of the NPANM III (2016-2025), several challenges must be tackled in order to effectively implement the identified strategies. Priority obstacles being lack of inter-sectorial and multi-stakeholder coordination, financial shortfalls and lack of human resource capacity.

A whole-of-government approach is the key to tackling nutrition-related disorders as the close collaboration of diverse ministries and agencies is required. The responsibility for implementation has also to be shared across different sectors. It is equally important to work in collaboration with the private sector, academic institutions, professional bodies and non-governmental organisations. It is imperative for all stakeholders to form strategic alliances, and pool together all the required resources to systematically implementing the identified strategies.

A key pre-requisite for effective implementation of programmes is qualified technical expertise needed at different levels. In this regard I am pleased to update that the Allied Health Professional Acts (AHP) 2016 is now in various stages of implementation. This is an important move towards ensuring qualified nutritionists play key roles in the national health agenda, to contribute towards improving food and nutrition scene in the country.

We have therefore chosen "*Together towards Optimal Nutrition*" as the theme of this 35th Conference of NSM. We cannot overemphasise the importance for all stakeholders to work together in promoting optimal nutrition among Malaysians.

With the onslaught of the Covid-19 pandemic, healthy nutrition has suddenly caught the attention of everyone, in the hope of strengthening their immunity, to fight the coronarvirus. As nutritionists, we should build on this interest and make healthy eating practices as their way of life. The pandemic will be overcome, hopefully sooner than later. But we still need to ensure that the community continue to make healthy nutrition their way of life in order to prevent problems related to under- and overnutrition.

I would like to extend my sincere gratitude to all who have contributed to the successful organisation of this first virtual Conference by NSM. I truly appreciate the effort and dedication of all speakers, oral and poster presenters, participants, sponsors and the secretariat of the Conference. Lastly, I wish to record my gratitude to the 17th Council of NSM for their involvement and cooperation in organising this Conference.

May everyone have a fruitful virtual 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.

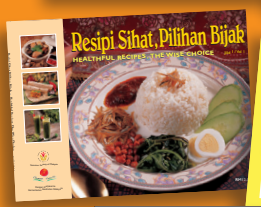
For more information, visit our website:
www.nutriweb.org.my

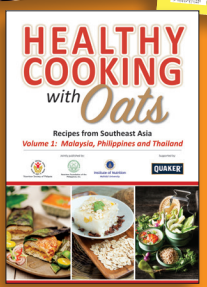
Our Activities

- 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

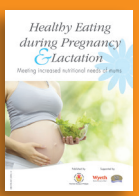
Our Major Publications

- 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)

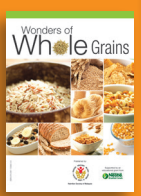




Junior Chef Cookbook Vol 1. Let's Play Healthy Cooking, Nutritionists' Choice Cookbook (Vol 1 & 2), Resipi Sihat, Pilihan Bijak (Vol 1 & 2), Healthy Cooking with Oats



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

Nutrition Month Malaysia 2020

Virtual Nutrition Fair

Invest in Healthy Nutrition: Eat Right, Get Moving

virtualfair.nutritionmonthmalaysia.org.my

1 – 14 December 2020

*T&C apply

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Nutrition Month Malaysia

nutritionmonth_malaysia

SCAN QR CODE

Website: Nutrition Month Malaysia

Jointly organised by:

Nutrition Society of Malaysia

Malaysian Dietitians' Association

Malaysian Association for the Study of Obesity

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星洲日報 Sin Chew Daily

The Star

HealthToday

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] offers eLearning modules on:

- Nutrition and Lifestyle during Pregnancy
- Breastfeeding
- Breast Milk Substitutes
- Nutrition of the Preterm Infant
- Malnutrition

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

Join our free online course now!

www.enea-sea.eu

@EarlyNutrition

Co-funded by the Erasmus+ Programme of the European Union

In collaboration with

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University of Southampton

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มหาวิทยาลัยมหิดล Mahidol University

University of Malaya

ESPGHAN

ชมรมโภชนาการเด็กแห่งประเทศไทย

Universiti Kebangsaan Malaysia The National University of Malaysia

Nutrition Association of Thailand (NAT)

ราชวิทยาลัยสูตินรีแพทย์แห่งประเทศไทย The Royal Thai College of Obstetricians and Gynaecologists

Persatuan Pediatrik Malaysia

Pediatric Federation of ASEAN Countries

Acknowledgements

The Nutrition Society of Malaysia gratefully acknowledges contributions from the following to the 35th Scientific Conference:

Major Sponsors

- Abbott
- Danone Specialized Nutrition
- DuPont Nutrition and Biosciences

Symposium Sponsors

- BENEO-Institute
- Herbalife Products Malaysia Sdn Bhd

Sponsor for NSM Publication Prizes

- Fonterra Brands (Malaysia) Sdn Bhd
- Herbalife Products Malaysia Sdn Bhd

Sponsor for Young Researchers' Symposium & Poster Competition

- International Life Sciences Institute Southeast Asia Region

Exhibitors & Advertisers

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- Ajinomoto (Malaysia) Berhad
- Fonterra Brands (Malaysia) Sdn Bhd
- Malaysian Palm Oil Board
- InBody Asia Sdn Bhd
- Yakult (Malaysia) Sdn Bhd

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

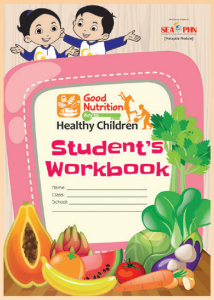
Nutrition Association of Thailand under the Patronage of Her Royal Highness Princess Maha Chakri Sirindhorn

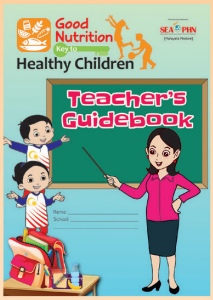
Vietnam Nutrition Association

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.

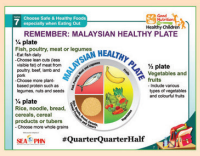
This initiative is supported by unconditional educational grants from corporate partners of the Network, namely BENEO GmbH, Danone, DuPont Nutrition & Health, Mondelez International (from 2018), Nestle (until 2017), PepsiCo (Quaker), and Tate & Lyle (till 2017).

Teaching Materials of the GNKHC Nutrition Module





Teacher's Guidebook and Student's Workbook



Learning Slides

Materials for Interactive activities

Parent's leaflet

Programme

Conference Scientific Programme

CONFERENCE DAY 1: TUESDAY, 24 NOVEMBER, 2020

0845 hrs Login to GoToWebinar platform

OPENING & AWARD OF NSM PRIZES
GoToWebinar online platform

0900 hrs **Speech and official opening by**
Tee E Siong
President, Nutrition Society of Malaysia

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

KEYNOTE LECTURE
Chairperson : Mohd Ismail Noor
Universiti Kebangsaan Malaysia

1000 hrs **Diet, happiness and longevity**
Hardinsyah
IPB University & Federation of Asian Nutrition Societies

SYMPOSIUM 1 : Maternal, Infant and Young Child Nutrition
Chairperson : Rokiah Don
Nutrition Society of Malaysia

1100 hrs **Management of gestational diabetes in Malaysia – solutions and challenges**
Sivalingam Nalliah
International Medical University

1130 hrs **Prevention of allergic diseases in infant and young child feeding: How should we feed them?**
Intan Hakimah Ismail
Department of Paediatrics, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia

1200 hrs **Poster viewing/Trade exhibition**

INVITED LECTURE 1
Chairperson : Tee E Siong
Nutrition Society of Malaysia

1300 hrs **Sustainable innovation and contribution to nutrition**
Cyndy Au and Victor Basuki
DuPont Nutrition & Biosciences

INVITED LECTURE 2
Chairperson : Tan Sue Yee
Nutrition Society of Malaysia

1345 hrs **The role of oral nutritional supplementation in growth intervention**
Siti Hawa Mohd Taib
University Malaya Medical Centre

YOUNG RESEARCHERS' SYMPOSIUM
Chairperson : Safiah Md Yusof
International Medical University

1430 hrs **The role of familial resemblance in peak bone mass attainment among Malaysian children**
Chang CY, Kanimolli A, Wong SY, Ong SH, Yang WY, Chong MHZ, Meenal M, Khoo EJ, Karuthan C and Chee WSS
Department of Nutrition & Dietetics, School of Health Sciences, International Medical University

1450 hrs **The association of serum adipokines and vitamin D level in newly diagnosed women with breast cancer. A case-control study**
Zunura'in Z, Sirajudeen KNS and Hamid Jan JM
Nutrition and Dietetics Program, School of Health Sciences, Universiti Sains Malaysia

1510 hrs **Food allergy mediates the association between maternal vitamin D status during late pregnancy and wasting in infants during the first year of life - a birth cohort study**
Woon FC, Chin YS, Batterham M, Intan Hakimah I, Yoke Mun Chan, Amir Hamzah AL, Gan WY, Geeta A, Siti Huzaifah MH, Muliana E, Tan ML, and Farhan HS
Department of Nutrition, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia

1530 hrs **Determination of umami taste perception and habitual intake of glutamate among primary school children in Klang Valley**
Lim SY, Rosmawati D, Noor Hafizah Y, Wong JE, Hasnah H and Poh BK
Nutritional Sciences Programme & Centre for Community Health Studies (ReaCH), Faculty of Health Sciences, Universiti Kebangsaan Malaysia

FREE PAPER PRESENTATION 1
Chairperson : Sangeetha Shyam
International Medical University

1600 hrs **Associations between pre-pubertal dietary intakes and puberty timing in boys and girls)**
Cheng TS, Sharp SJ, Soren B, Nita GF and Ong KK
MRC Epidemiology Unit, Institute of Metabolic Science, University of Cambridge School of Clinical Medicine, United Kingdom

1610 hrs **Factors associated with sleep habits in children with Autism Spectrum Disorder**
Eow SY, Gan WY, Zalilah MS, Hamidin A and Lim PY
Department of Nutrition and Dietetics, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia

1620 hrs **Measuring quality of life among women of reproductive age during Covid-19 pandemic**
Dian LS, Muhammad NHS and Nurbaya
Nutrition Study Program, Faculty of Health Science, Universitas Pembangunan Nasional Veteran Jakarta, Indonesia

1630 hrs **Changes of body weight and body weight status: Impact of Movement Control Order during the COVID-19 pandemic in Malaysia**
Chan YM and Chin YS
Department of Dietetics, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia

1640 hrs **Anaemia among pregnant women attending antenatal care in Selangor: What are the determinants?**
Nurul Farehah S and Rohana AJ
Department of Community Medicine, School of Medicine Sciences, Universiti Sains Malaysia

1650 hrs **Impact of The Sihat 365© Program on awareness of healthy eating and physical activity among adults with prediabetes in community setting**
Surainee W, Radin Nur Suhaida RMN and Ruzita AT
AAA Vision Academy

1700 hrs **The associations between screen time and psychosocial wellbeing of pregnant women in Kuala Lumpur, Malaysia**
Wong LX, Kaur S, Tiong MCL and Ng CM
Faculty of Applied Sciences, UCSI University

1710 hrs **End of Day 1**

CONFERENCE DAY 2: WEDNESDAY, 25 NOVEMBER 2020

0845 hrs Login to GoToWebinar platform

FREE PAPER PRESENTATION 2
Chairperson : Chan Yoke Mun
Universiti Putra Malaysia

0900 hrs **Cluster analysis of macronutrient intake and DNA damage among Malay women**
Ng CY, Seghayat MS, Normina AB, Tan ESS, Tan CK, Thiagarajah S, Ng ESC and Amini F
School of Healthy Aging, Medical Aesthetics, Regenerative Medicine,
Faculty of Medicine and Health Sciences, UCSI University

0910 hrs **Postprandial glycaemic response to isomaltulose in healthy Malaysian adults: a single-blind, randomised, crossover pilot study**
Ong JW, Megan CHZ, Shyam S, Tan SS and Ng XQ
Division of Nutrition & Dietetics, School of Health Sciences, International Medical University (IMU)

0920 hrs **Identification of frequently available street food to strengthen salt reduction action in Malaysia)**
Hasnah H, Wan Whah N, Zainorain Natasha ZA, Suzana S, Feisul Idzwan M, Viola M, Arunah C, Siti Farrah Zaidah MY, Taketo T and Ying-Ru L
Nutritional Sciences Programme and Centre for Healthy Ageing and Wellness, Faculty of Health Sciences, Universiti Kebangsaan Malaysia

0930 hrs **Infants feeding practice and maternal experiences during COVID-19 pandemic in Malaysia: The COVID-19 Mom-Baby Study Preliminary Findings**
Nurul Husna MS, Gan WY, Nurzalinda Z, Maiza Tusimin and Nuruljannah MN
Department of Nutrition, Faculty of Medicine and Health Sciences,
Universiti Putra Malaysia

0940 hrs **The prevalence of serum 25 hydroxyvitamin D deficiency in nasopharyngeal carcinoma: a cross-sectional hospital-based study**
Vaidehi U, Lye MS and Loh SP
Faculty of Applied Science, UCSI University

0950 hrs **Higher body fat percentage, BMI and waist circumference is associated with lower 25OHD concentration among pre-menopausal indoor female workers**

Nurul Nadiah S, Nor Aini J, Arimi Fitri ML and Zahara AM
Faculty of Sports Sciences and Recreation, Universiti Teknologi MARA Pahang

1000 hrs **SEANUTS II Malaysia: Mitigating the challenges of conducting a children's nutrition survey in the era of COVID-19 pandemic**

Poh BK, Chia JSM, Wong JE, Ang YN, Lee ST, Yeo GS, Teh KC, Nurul Azreen A, Nur Syamira S, Kan YK, Lee KY, Nazihah MA, Tan DJY, Tan HL, Salmi Ezleen MS, Sameeha MJ, Koh D, Ruzita AT and Wee LH on behalf of the SEANUTS II study group
Centre for Community Health Studies (ReaCH), Faculty of Health Sciences, Universiti Kebangsaan Malaysia

1010 hrs **The effects of Cosmos caudatus supplementation on neurodegenerative prevention among older adults with mild cognitive impairment**

You YX, Suzana S, Nor FR, Hasnah H and Mazlyfarina M
Dietetics Programme, H-CARE, Fakulti Sains Kesihatan, Universiti Kebangsaan Malaysia

SYMPOSIUM 2 : School Child and Adolescent Nutrition
Chairperson : Poh Bee Koon
Universiti Kebangsaan Malaysia

1030 hrs **Nutrition Society of Malaysia (NSM) promotes school child nutrition**

Chin YS, Tee ES, Norimah AK and Zawiah H
Nutrition Society of Malaysia, Kuala Lumpur

1130 hrs **Understanding Malaysian adolescents' perception of healthy eating and active lifestyle**

Sharifah Intan Zainun SI, Chin YS, Mohd Nasir MT and Zalilah MS
Department of Healthcare Professional, Faculty of Health and Life Sciences, Management and Science University

INVITED LECTURE 3
Chairperson : Norimah A Karim
International Medical University

1130 hrs **Catch up growth in undernourished children: The challenge and success**

Hamid Jan Jan Mohamed
Nutrition and Dietetics Programme, School of Health Sciences, Universiti Sains Malaysia

1215 hrs **Poster Viewing / Trade Exhibition**

INVITED LECTURE 4
Chairperson : Mahenderan Appukutty
Universiti Teknologi MARA

1315 hrs **Roles & functions of beneficial microorganisms in the human Gut**
Alex Teo
Regional Director, Herbalife Nutrition, Research & Development and Scientific Affairs

INVITED LECTURE 5
Chairperson : Roseline Yap Wai Kuan
Nutrition Society of Malaysia

1400 hrs **Isomaltulose (Palatinose™): Recent evidence for health benefits**
Sangeetha Shyam
Department of Nutrition and Dietetics, School of Health Sciences, International Medical University

INVITED LECTURE 6
Chairperson : Amin Ismail
University Putra Malaysia

1445 hrs **Bioactives as functional ingredients in palm oil**
Kanga Rani Selvaduray
Nutrition Unit, Product Development and Advisory Services Division, Malaysian Palm Oil Board, Kuala Lumpur

SYMPOSIUM 3 : Food Environment, Food Security and Technological Approaches in Nutrition
Chairperson : Zaitun Yassin
Nutrition Society of Malaysia

1530 hrs **Food marketing and its impact on diets**
Sameeha Mohd Jamil
Nutrition Programme and Centre for Community Health Studies (ReaCH), Faculty of Health Sciences, Universiti Kebangsaan Malaysia

1600 hrs **Utilising technology to assess compliance with Dietary Guidelines: The CSIRO Healthy Diet Score survey**
Gilly Hendrie
Commonwealth Scientific and Industrial Research Organisation, Adelaide

SYMPOSIUM 4 : Physical Activity and Sedentary Behaviour
Chairperson : Wong Jyh Eiin
Universiti Kebangsaan Malaysia

1630 hrs **National Strategic Plan for Active Living**
Vanitha Subramaniam
Health Promotion and Education Division, Ministry of Health Malaysia

1700 hrs **Physical activity behaviour among preschool children in Malaysia: preliminary results from the SUNRISE study**
Koh D, Cho LB, Wong JE, Poh BK and Okely AD
Centre for Education and Community Well-being, Faculty of Education, Universiti Kebangsaan Malaysia, Bangi

PRIZE GIVING CEREMONY AND CLOSING
Officiated by : Mohd Ismail Noor
Vice President, Nutrition Society of Malaysia

1745 hrs **Prizes presentation**

1815 hrs **Conference ends**

POST-CONFERENCE: THURSDAY, 26 NOVEMBER 2020

1600 hrs **Meet the President Session**
- Undergraduate and postgraduate students are invited to join this session to interact with the NSM Council members
- Interested students are invited to register to join this session via GoToWebinar using a link provided at the end of the Conference Programme on the conference website

1800 hrs **End of session**

Conference Information

SCIENTIFIC PROGRAMME

All symposia and lectures will be organised via GoToWebinar online platform. Only registered participants via the link provided by the Secretariat will be able to enter the GoToWebinar platform.

Kindly log on through GoToWebinar online platform 15 minutes before the conference session begins:

- 24 November 2020: 8.45 am – 5.30 pm
- 25 November 2020: 8.45 am – 6.15 pm

General rules using the GoToWebinar Platform

Please check that you have a strong internet connection.

If the audio is unclear, please use a good headset to ensure clear audio.

All attending participants are requested to "mute" and switch off your "webcam video" so as to not interrupt the presentation by speakers.

Due to the limitation of time, only selected questions shall be discussed during any Questions and Answers session.

SCIENTIFIC POSTER EXHIBITION

All scientific posters shall be available on "Scientific Poster" section of the NSM Conference 2020 Website: https://www.nsmconference.org.my/scientific-posters/

TRADE EXHIBITION

Trade exhibition is available on "Virtual Exhibition" section of the NSM Conference 2020 Website: https://www.nsmconference.org.my/virtual-exhibition/

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 10 working days after the Conference via email (soft-copy). Special certificates will be given to those who participated in the Young Researchers' Symposium, Free Paper Presentation sessions and Poster Exhibitions. To request for E-certificates, kindly write your full name and email address, and you may email to: secretariat.nsm.conference@gmail.com.

FOR PRESENTERS

Please only unmute yourself during your presentation and Q&A session.

Webcam shall only be turn ON during your presentation and Q&A session. Please ensure your webcam is ON before you present.

Turn off desktop notifications during your presentation. An incoming message or alert on your screen can distract people from what you are sharing.

Please check your Chat Box at all times for any communication from the Organizer/ Panelist.

NSM Prizes 2020

NSM Postgraduate and Undergraduate Prizes 2020

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

In 2020, NSM is awarding four Postgraduate Prizes; one for PhD and three for MSc, with a total cash award of RM3,250. Six undergraduates receive Undergraduate Prizes with a total cash award of RM 3,000. The total cash award for both categories of thesis prizes this year is RM6,250.

The recipient for the PhD thesis prize is:

1. **Dr Sharifah Intan Zainun Sharif Ishak**
   Effectiveness of "Eat right, be positive about your body and live actively" programme in preventing overweight and disordered eating among Malaysian adolescents
   Supervisor: *Assoc Prof Dr Chin Yit Siew*
   Co-supervisors: *Assoc Prof Dr Mohd Nasir Mohd Taib, Prof Dr Chan Yoke Mun & Prof Dr Zalilah Mohd Shariff*
   University: *Faculty of Medicine and Health Sciences, Universiti Putra Malaysia (UPM)*

The recipients for the MSc thesis prizes are:

1. **Ainaa Fatehah binti Ayob**
   Validity of electronic image-assisted food diary for dietary intake assessment of adults
   Supervisor: *Dr Wong Jyh Eiin*
   Co-supervisors: *Prof Dr Poh Bee Koon*
   University: *Faculty of Health Sciences, Universiti Kebangsaan Malaysia (UKM)*

2. **Chang Wei Lin**
   Cardioprotective effects of yellowstripe scad compared to salmon among healthy overweight adults in a randomized crossover trial
   Supervisor: *Assoc Prof Dr Loh Su Peng*
   Co-supervisors: *Prof Ts Dr Azrina Azlan, Assoc Prof Dr Sabariah Md Noor*
   University: *Faculty of Medicine and Health Sciences, Universiti Putra Malaysia (UPM)*

3. **Nurnazahiah binti Ali**
   Physical activity, sedentary behaviour and their relationship with adiponectin, leptin and health-related quality of life among breast cancer survivors
   Supervisor: *Assoc Prof Dr Mohd Razif bin Shahril*
   Co-supervisors: *Prof Dr Lua Pei Lin*
   University: *Faculty of Health Sciences, Universiti Sultan Zainal Abidin (UniSZA)*

The recipients for the undergraduate thesis prizes are:

1. **Rasyidah binti Ali**
   Associations of milk feeding practice, milk appetite, and dietary intake with nutritional status among young children aged 2 to 4 in Permata Negara Zon Tengah
   Supervisor: *Dr Nurul Husna Mohd Shukri*
   University: *Faculty of Medicine and Health Sciences, Universiti Putra Malaysia*

2. **Zainorain Natasha binti Zainal Arifen**
   Survey on salt content in food products of fast food restaurants and the determination of salt intake awareness among fast food consumers in Klang Valley
   Supervisor: *Assoc Prof Dr Hasnah Haron*
   University: *Faculty of Health Sciences, Universiti Kebangsaan Malaysia*

3. **Nurul Syahidah binti Mohd Nazri**
   The relationship between behavioural belief, attitude, perceived behavioural control and intention with consumption of dairy products among primary school children in Kota Bharu, Kelantan
   Supervisor: *Dr Soo Kah Leng*
   University: *School of Health Sciences, Universiti Sains Malaysia*

4. **Lee Lii Sin**
   Determination of in vitro starch digestibility, α-amylase and α- glucosidase inhibitory capabilities and glycaemic response of guava at different ripening stages
   Supervisor: *Dr Chang Suit Kiat*
   Co-supervisor: *Assoc Prof Dr Snigdha Misra*
   University: *Division of Nutrition and Dietetics, International Medical University*

5. **Mohammad Aleef Mohd Bakri**
   Effects of intermittent fasting on metabolic syndrome risk markers in rats fed with high sucrose and saturated fat diet
   Supervisor: *Assoc Prof Dr Masanori Katakura*
   Co-supervisor: *Dr Hisami Koito, Sarina Sariman*

University: *Faculty of Health & Life Sciences, Management & Science University*

6. **Ong Hui Yi**
Barriers to and facilitators for healthy meal preparation among children aged 9-10 in Kuala Lumpur, Malaysia
Supervisor: *Asst Prof Dr Satvinder Kaur*
University: *Faculty of Applied Sciences, UCSI University*

NSM Publication Prizes 2020

The NSM Publication Prizes are aimed at encouraging and promoting local research publications in nutrition science among NSM members. Prizes are awarded by the Nutrition Society of Malaysia with financial support from Corporate Members of the Society. In 2020, two Corporate Members of NSM have supported this initiative, namely Fonterra Brands (M) Sdn Bhd (C 1879) and Herbalife Products Malaysia Sdn Bhd (C 2195).

Fonterra sponsored prizes for three categories of NSM Publication Prizes for the year 2019 till 2021. These are for different fields of nutrition research, namely: Maternal Nutrition; Dairy Nutrition and Mobility and Musculoskeletal Health and Nutrition. For each category, the intention was to provide 1 award each year, each to carry a cash prize of RM2,000 and a certificate by NSM.

Herbalife sponsored prizes for the year 2020 till 2022 with four categories of NSM Publication Prizes in different fields of nutrition research, namely Functional Foods & Healthy Ageing; Healthy Eating and Physical Activity in Prevention of Non-communicable Diseases (NCDs); Community Support in the Promotion of Healthy Lifestyle and lastly Soya protein and health benefits. Similarly, for each category, the intention was to provide 1 award each year, each to carry a cash prize of RM2,000 and a certificate by NSM.

NSM Publication Prize: Maternal Nutrition

For the year 2020, four applications were received for this category sponsored by Fonterra Brands Sdn Bhd. The Selection Committee decided to award the prize to one applicant, with the following details:

Name of recipient:	**Ms Woon Fui Chee** [O 2052] Department of Nutrition and Dietetics, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia
Publication:	Maternal vitamin D levels during late pregnancy and risk of allergic diseases and sensitization during the first year of life - a birth cohort study *Nutrients, 12, 2418. https://doi.org/10.3390/nu12082418*

NSM Publication Prize: Dairy Nutrition

For the year 2020, one application was received for this category sponsored by Fonterra Brands Sdn Bhd. The Selection Committee decided to award the prize to this applicant, with the following details:

Name of recipient:	**Mr Leiu Kok Hong** [O 2303] Department of Nutrition and Dietetics, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia
Publication:	High body fat percentage and low consumption of dairy products were associated with vitamin D inadequacy among older women in Malaysia *PLoS ONE 15(2): e0228803.* *https://doi.org/10.1371/journal.pone.0228803*

NSM Publication Prize: Mobility and Musculoskeletal Health and Nutrition

For the year 2020, only one application has been received for this category sponsored by Fonterra Brands Sdn Bhd. The Selection Committee decided not to award the prize to the applicant.

NSM Publication Prize: Functional Foods & Healthy Ageing

For the year 2020, only one application (with four publications) has been received for this category sponsored by Herbalife Products Malaysia Sdn Bhd. The Selection Committee decided not to award the prize to the applicant.

NSM Publication Prize: Healthy Eating and Physical Activity in Prevention of Non-communicable Diseases (NCDs)

For the year 2020, one application was received for this category sponsored by Herbalife Products Malaysia Sdn Bhd. The Selection Committee decided to award the prize to this applicant, with the following details:

Name of recipient:	**Ms Fatimah Sulong** [L 1384] Nutrition Division, Ministry of Health Malaysia, Putrajaya
Publication:	Consumer awareness and understanding of FOP energy icon labelling in Negeri Sembilan *Mal J Nutr* 25(2):287-296, 2019. *https://doi.org/10.31246/mjn-2018-0127*

NSM Publication Prize: Community Support in the Promotion of Healthy Lifestyle

For the year 2020, only one application has been received for this category sponsored by Herbalife Products Malaysia Sdn Bhd. The Selection Committee decided not to award the prize to the applicant.

NSM Publication Prize: Soya protein and Health Benefits

For the year 2020, only one application (with two publications) has been received for this category sponsored by Herbalife Products Malaysia Sdn Bhd. The Selection Committee decided not to award the prize to the applicant.

NSM Young Researchers' Symposium Prizes 2020

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

1st Prize – RM400
2nd Prize – RM300
3rd Prize – RM200
1 Consolation Prize of RM100

Prizes for 2020, totalling RM1,000 are provided by International Life Sciences Institute (ILSI) Southeast Asia Region.

NSM Poster Competition Prizes 2020

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 2020, totalling RM750 are provided by International Life Sciences Institute (ILSI) Southeast Asia Region.

Announcements
NSM Publication Prizes 2021

Applications are invited for:

1. Maternal Nutrition

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

Objective:

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

The Prize:

There shall be a maximum of 1 award each year, each to carry a cash prize of RM2,000 and a certificate by the NSM. For the years 2019-2021, this Prize shall be sponsored by Fonterra Brands (M) Sdn Bhd.

Applications for the Prize:

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

Presentation of awards:

Prizes are to be presented during the opening ceremony of the 36th Scientific Conference of the Nutrition Society of Malaysia. Winners shall be invited to attend the ceremony, at his/her own expense, to receive the prize.

Application procedure:

1. The NSM Council shall invite applications for the Publication Prize through NutriWeb (www.nutriweb.org.my), research institutions, academia and government departments.
2. Applicants must be Malaysian citizens and Ordinary (with no outstanding membership fees) or Life members of NSM.
3. Deadline for receipt for applications for NSM Publication prize shall be announced in the NSM website.

4. Applicants must submit the following for consideration of the NSM selection committee:
    a. A copy of the published paper in pdf for the consideration of the selection committee
    b. A cover letter indicating intent to apply for consideration for the publication prize and stating the number of publications submitted as well as the full details of each publication (author(s), title of publication, journal details)
    c. The following personal particulars
        i. Name
        ii. NSM membership number
        iii. Address of work place
        iv. Email and contact number
    d. A statement stating why the submitted publication(s) should be considered for the Prize, pointing out, for example, significance of study and findings, its usefulness and impact.

All documents stated in item 4 should be emailed to the President at: president@nutriweb.org.my and copy to the Hon. Secretary at: secretary@nutriweb.org.my, to reach them before the stipulated deadline.

Criteria for Selection:

1. Publication(s) submitted for consideration by the Selection Committee must be in the field of maternal nutrition in the Malaysian context, arising from human intervention, epidemiology or clinical studies or critical reviews.
2. The publication(s) must be in the English language, published in a peer reviewed journal, in the year 2016 and later. There is no limit to the number of publications submitted for consideration.
3. The applicant must be the first author of the publication(s) submitted for consideration.
4. Selection of winners shall be based on multiple criteria, including relevance to focus area of Publication Prize, relevance to national nutrition scene, soundness of research methodology and overall presentation of the publication.
5. Criteria for selection may be amended from time to time by the NSM Council.
6. Decision of the Selection Committee is final.

2. Dairy Nutrition

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

Objective:

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

The Prize:

There shall be a maximum of 1 award each year, each to carry a cash prize of RM2,000 and a certificate by the NSM. For the years 2019-2021, this Prize shall be sponsored by Fonterra Brands (M) Sdn Bhd.

Applications for the Prize:

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

Presentation of awards:

Prizes are to be presented during the opening ceremony of the 36th Scientific Conference of the Nutrition Society of Malaysia. Winners shall be invited to attend the ceremony, at his/her own expense, to receive the prize.

Application procedure:

1. The NSM Council shall invite applications for the Publication Prize through NutriWeb. (www.nutriweb.org.my), research institutions, academia and government departments
2. Applicants must be Malaysian citizens and Ordinary (with no outstanding membership fees) or Life members of NSM.
3. Deadline for receipt for applications for NSM Publication prize shall be announced in the NSM website**.**
4. Applicants must submit the following for consideration of the NSM selection committee:
   a. A copy of the published paper in pdf for the consideration of the selection committee
   b. A cover letter indicating intent to apply for consideration for the publication prize and stating the number of publications submitted as well as the full details of each publication (author(s), title of publication, journal details)

      The following personal particulars should be included:

      v. Name
      vi. NSM membership number
      vii. Address of work place
      viii. Email and contact number

      A statement stating why the submitted publication(s) should be considered for the Prize, pointing out, for example, significance of study and findings, its usefulness and impact.

5. All documents stated in item 4 should be emailed to the President at: president@nutriweb.org.my and copy to the Hon. Secretary at: secretary@nutriweb.org.my, to reach them before the stipulated deadline.

Criteria for Selection:

1. Publication(s) submitted for consideration by the Selection Committee must be in the field of dairy nutrition in the Malaysian context, arising from human intervention, epidemiology or clinical studies or critical reviews.
2. The publication(s) must be in the English language, published in a peer reviewed journal, in the year 2016 and later. There is no limit to the number of publications submitted for consideration.
3. The applicant must be the first author of the publication(s) submitted for consideration.
4. Selection of winners shall be based on multiple criteria, including relevance to focus area of Publication Prize, relevance to national nutrition scene, soundness of research methodology and overall presentation of the publication.
5. Criteria for selection may be amended from time to time by the NSM Council.
6. Decision of the Selection Committee is final.

3. Mobility & Musculoskeletal Health & Nutrition

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

Objective:

To encourage and promote local research publications in the field of Mobility & Musculoskeletal Health & Nutrition.

The Prize:

There shall be a maximum of 1 award each year, each to carry a cash prize of RM2,000 and a certificate by the NSM. For the years 2019-2021, this Prize shall be sponsored by Fonterra Brands (M) Sdn Bhd.

Applications for the Prize:

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

Presentation of awards:

Prizes are to be presented during the opening ceremony of the 36th Scientific Conference of the Nutrition Society of Malaysia. Winners shall be invited to attend the ceremony, at his/her own expense, to receive the prize.

Application procedure:

1. The NSM Council shall invite applications for the Publication Prize through NutriWeb (www.nutriweb.org.my), research institutions, academia and government departments.
2. Applicants must be Malaysian citizens and Ordinary (with no outstanding membership fees) or Life members of NSM.
3. Deadline for receipt for applications for NSM Publication prize shall be announced in the NSM website**.**
4. Applicants must submit the following for consideration of the NSM selection committee:
   a. A copy of the published paper in pdf for the consideration of the selection committee
   b. A cover letter indicating intent to apply for consideration for the publication prize and stating the number of publications submitted as well as the full details of each publication (author(s), title of publication, journal details)

      The following personal particulars should be included:

      ix. Name
      x. NSM membership number
      xi. Address of work place
      xii. Email and contact number

      A statement stating why the submitted publication(s) should be considered for the Prize, pointing out, for example, significance of study and findings, its usefulness and impact.

5. All documents stated in item 4 should be emailed to the President at: president@nutriweb.org.my and copy to the Hon. Secretary at: secretary@nutriweb.org.my, to reach them before the stipulated deadline.

Criteria for Selection:

1. Publication(s) submitted for consideration by the Selection Committee must be in the field of Mobility & Musculoskeletal Health & Nutrition in the Malaysian context, arising from human intervention, epidemiology or clinical studies or critical reviews.
2. The publication(s) must be in the English language, published in a peer reviewed journal, in the year 2016 and later. There is no limit to the number of publications submitted for consideration.
3. The applicant must be the first author of the publication(s) submitted for consideration.
4. Selection of winners shall be based on multiple criteria, including relevance to focus area of Publication Prize, relevance to national nutrition scene, soundness of research methodology and overall presentation of the publication.
5. Criteria for selection may be amended from time to time by the NSM Council.
6. Decision of the Selection Committee is final.

4. Functional Foods & Healthy Ageing

Members of the Nutrition Society of Malaysia (NSM) are invited to apply for the NSM Publication Prize: Functional Foods & Healthy Ageing.

Objective:

To encourage and promote local research publications in the field of Functional Foods & Healthy Ageing.

The Prize:

There shall be a maximum of 1 award each year, each to carry a cash prize of RM2,000 and a certificate by the NSM. For the years 2020-2022, this Prize shall be sponsored by Herbalife Products Malaysia Sdn. Bhd.

Applications for the Prize:

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

Presentation of awards:

Prizes are to be presented during the opening ceremony of the 36th Scientific Conference of the Nutrition Society of Malaysia. Winners shall be invited to attend the ceremony, at his/her own expense, to receive the prize.

Application procedure:

1. The NSM Council shall invite applications for the Publication Prize through NutriWeb (www.nutriweb.org.my), research institutions, academia and government departments.
2. Applicants must be Malaysian citizens and Ordinary (with no outstanding membership fees) or Life members of NSM.
3. Deadline for receipt for applications for NSM Publication prize shall be announced in the NSM website**.**
4. Applicants must submit the following for consideration of the NSM selection committee:
    a. A copy of the published paper in pdf for the consideration of the selection committee
    b. A cover letter indicating intent to apply for consideration for the publication prize and stating the number of publications submitted as well as the full details of each publication (author(s), title of publication, journal details)
    c. The following personal particulars
        i. Name
        ii. NSM membership number
        iii. Address of work place
        iv. Email and contact number
    d. A statement stating why the submitted publication(s) should be considered for the Prize, pointing out, for example, significance of study and findings, its usefulness and impact.

5. All documents stated in item 4 should be emailed to the President at: president@nutriweb.org.my and copy to the Hon. Secretary at: secretary@nutriweb.org.my, to reach them before the deadline stated.

Criteria for Selection:

1. Publication(s) submitted for consideration by the Selection Committee must be in the field of Functional Foods & Healthy Ageing in the context of the adult Malaysian population, arising from human intervention, epidemiology or clinical studies or critical reviews.
2. The publication(s) must be in the English language, published in a peer reviewed journal, in the year 2016 and later. There is no limit to the number of publications submitted for consideration.
3. The applicant must be the first author of the publication(s) submitted for consideration.
4. Selection of winners shall be based on multiple criteria, including relevance to focus area of Publication Prize, relevance to national food and nutrition scene, soundness of research methodology and overall presentation of the publication.
5. Criteria for selection may be amended from time to time by the NSM Council.
6. Decision of the Selection Committee is final.

5. Healthy Eating and Physical Activity in Prevention of Non-communicable Diseases (NCDs)

Members of the Nutrition Society of Malaysia (NSM) are invited to apply for the NSM Publication Prize: Healthy Eating and Physical Activity in Prevention of NCDs.

Objective:

To encourage and promote local research publications in the field of Healthy Eating and Physical Activity in Prevention of NCDs.

The Prize:

There shall be a maximum of 1 award each year, each to carry a cash prize of RM2,000 and a certificate by the NSM. For the years 2020-2022, this Prize shall be sponsored by Herbalife Products Malaysia Sdn. Bhd.

Applications for the Prize:

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

Presentation of awards:

Prizes are to be presented during the opening ceremony of the 36th Scientific Conference of the Nutrition Society of Malaysia. Winners shall be invited to attend the ceremony, at his/her own expense, to receive the prize.

Application procedure:

1. The NSM Council shall invite applications for the Publication Prize through NutriWeb (www.nutriweb.org.my), research institutions, academia and government departments.
2. Applicants must be Malaysian citizens and Ordinary (with no outstanding membership fees) or Life members of NSM.
3. Deadline for receipt for applications for NSM Publication prize shall be announced in the NSM website**.**
4. Applicants must submit the following for consideration of the NSM selection committee:
    a. A copy of the published paper in pdf for the consideration of the selection committee
    b. A cover letter indicating intent to apply for consideration for the publication prize and stating the number of publications submitted as well as the full details of each publication (author(s), title of publication, journal details)
    c. The following personal particulars
        i. Name
        ii. NSM membership number
        iii. Address of work place
        iv. Email and contact number
    d. A statement stating why the submitted publication(s) should be considered for the Prize, pointing out, for example, significance of study and findings, its usefulness and impact.

5. All documents stated in item 4 should be emailed to the President at: president@nutriweb.org.my and copy to the Hon. Secretary at: secretary@nutriweb.org.my, to reach them before the deadline stated.

Criteria for Selection:

1. Publication(s) submitted for consideration by the Selection Committee must be in the field of Healthy Eating and Physical Activity in Prevention of NCDs in the context of the adult Malaysian population, arising from human intervention, epidemiology or clinical studies or critical reviews.
2. The publication(s) must be in the English language, published in a peer reviewed journal, in the year 2016 and later. There is no limit to the number of publications submitted for consideration.
3. The applicant must be the first author of the publication(s) submitted for consideration.
4. Selection of winners shall be based on multiple criteria, including relevance to focus area of Publication Prize, relevance to national food and nutrition scene, soundness of research methodology and overall presentation of the publication.
5. Criteria for selection may be amended from time to time by the NSM Council.
6. Decision of the Selection Committee is final.

6. Community Support in the Promotion of Healthy Lifestyle

Members of the Nutrition Society of Malaysia (NSM) are invited to apply for the NSM Publication Prize: Community Support in the Promotion of Healthy Lifestyle.

Objective:

To encourage and promote local research publications in the field of Community Support in the Promotion of Healthy Lifestyle.

The Prize:

There shall be a maximum of 1 award each year, each to carry a cash prize of RM2,000 and a certificate by the NSM. For the years 2020-2022, this Prize shall be sponsored by Herbalife Products Malaysia Sdn. Bhd.

Applications for the Prize:

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

Presentation of awards:

Prizes are to be presented during the opening ceremony of the 36th Scientific Conference of the Nutrition Society of Malaysia. Winners shall be invited to attend the ceremony, at his/her own expense, to receive the prize.

Application procedure:

1. The NSM Council shall invite applications for the Publication Prize through NutriWeb (www.nutriweb.org.my), research institutions, academia and government departments.
2. Applicants must be Malaysian citizens and Ordinary (with no outstanding membership fees) or Life members of NSM.
3. Deadline for receipt for applications for NSM Publication prize shall be announced in the NSM website**.**
4. Applicants must submit the following for consideration of the NSM selection committee:
    e. A copy of the published paper in pdf for the consideration of the selection committee
    f. A cover letter indicating intent to apply for consideration for the publication prize and stating the number of publications submitted as well as the full details of each publication (author(s), title of publication, journal details)
    g. The following personal particulars
        i. Name
        ii. NSM membership number
        iii. Address of work place
        iv. Email and contact number
    h. A statement stating why the submitted publication(s) should be considered for the Prize, pointing out, for example, significance of study and findings, its usefulness and impact.

5. All documents stated in item 4 should be emailed to the President at: president@nutriweb.org.my and copy to the Hon. Secretary at: secretary@nutriweb.org.my, to reach them before the deadline stated.

Criteria for Selection:

1. Publication(s) submitted for consideration by the Selection Committee must be in the field of Community Support in the Promotion of Healthy Lifestyle in the context of the adult Malaysian population, arising from human intervention, epidemiology or clinical studies or critical reviews.
2. The publication(s) must be in the English language, published in a peer reviewed journal, in the year 2016 and later. There is no limit to the number of publications submitted for consideration.
3. The applicant must be the first author of the publication(s) submitted for consideration.
4. Selection of winners shall be based on multiple criteria, including relevance to focus area of Publication Prize, relevance to national food and nutrition scene, soundness of research methodology and overall presentation of the publication.
5. Criteria for selection may be amended from time to time by the NSM Council.
6. Decision of the Selection Committee is final.

7. Soya protein and health benefits

Members of the Nutrition Society of Malaysia (NSM) are invited to apply for the NSM Publication Prize: soya protein and health benefits.

Objective:

To encourage and promote local research publications in the field of soya protein and health benefits.

The Prize:

There shall be a maximum of 1 award each year, each to carry a cash prize of RM2,000 and a certificate by the NSM. For the years 2020-2022, this Prize shall be sponsored by Herbalife Products Malaysia Sdn. Bhd.

Applications for the Prize:

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

Presentation of awards:

Prizes are to be presented during the opening ceremony of the 36th Scientific Conference of the Nutrition Society of Malaysia. The selection shall be based on a set of prescribed criteria described below.

Application procedure:

1. The NSM Council shall invite applications for the Publication Prize through NutriWeb (www.nutriweb.org.my), research institutions, academia and government departments.
2. Applicants must be Malaysian citizens and Ordinary (with no outstanding membership fees) or Life members of NSM.
3. Deadline for receipt for applications for NSM Publication prize shall be announced in the NSM website**.**
4. Applicants must submit the following for consideration of the NSM selection committee:
    a. A copy of the published paper in pdf for the consideration of the selection committee
    b. A cover letter indicating intent to apply for consideration for the publication prize and stating the number of publications submitted as well as the full details of each publication (author(s), title of publication, journal details)
    c. The following personal particulars
        i. Name
        ii. NSM membership number
        iii. Address of work place
        iv. Email and contact number
    d. A statement stating why the submitted publication(s) should be considered for the Prize, pointing out, for example, significance of study and findings, its usefulness and impact.

5. All documents stated in item 4 should be emailed to the President at: president@nutriweb.org.my and copy to the Hon. Secretary at: secretary@nutriweb.org.my, to reach them before the deadline stated.

Criteria for Selection:

1. Publication(s) submitted for consideration by the Selection Committee must be in the field of soya protein and health benefits in the context of the adult Malaysian population, arising from human intervention, epidemiology or clinical studies or critical reviews.
2. The publication(s) must be in the English language, published in a peer reviewed journal, in the year 2016 and later. There is no limit to the number of publications submitted for consideration.
3. The applicant must be the first author of the publication(s) submitted for consideration.
4. Selection of winners shall be based on multiple criteria, including relevance to focus area of Publication Prize, relevance to national food and nutrition scene, soundness of research methodology and overall presentation of the publication.
5. Criteria for selection may be amended from time to time by the NSM Council.
6. Decision of the Selection Committee is final.

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) & Community Interventions

A01 Demographic and socioeconomic characteristics in relationship to food insecurity among households living in People's Housing Program (PHP) Klang Valley Malaysia
Asrawati Awalina Aslan and Norhasmah Sulaiman

A02 SWOT analysis in understanding the role of nutritionists in promoting optimal nutritional well-being of Malaysians
Atikah Wardah M and Chin YS

A03 Are older adults eating enough?
Camilla Wahida N, Siti Nur'asyura A and Rosita J

A04 Association of gestational weight gain with social jetlag and sleep quality
Cheah V and Satvinder K

A05 Body balance and its relationship with physical activity level among older adults who practise Qigong
Cheong ST and Wong JE

A06 Validation of healthy eating self-efficacy scale for secondary school students in Kuala Lumpur, Malaysia
Chew WL, Satvinder K, Nurul Husna MS, Shibata S, Siti Raihanah S, Normina AB, Nor Aini J, Takahashi M and Lim PJ

A07 Prevalence of overweight and obesity among vegetarians and its associated factors
Ching YK, Chin YS, Mahenderan A, Gan WY and Chan YM

A08 Association between sleep quality and physical activity level among university students
Gan XY and Tung SEH

A09 Relationship between lifestyle and students' academic performance in private higher institutions in Klang Valley
Lou GW and Haryati AH

A10 Characteristics of weight and BMI changes among individuals who perceived to experience an intentional weight loss: a preliminary finding from a Malay majority population
Husin NQ and Shahril MR

A11 The Effectiveness of Warga Emas Sihat (WESIHAT) Program Towards Quality of Life of Elderly at Pusat Aktiviti Warga Emas (PAWE) Sg Kantan, Kajang, Selangor
Intan NI, Hanis MY and Suzana S

A12 Boosting immunity with proper nutrition: an update
Jesmine K, Wan Nor I'zzah WMZ and Mohammed NI

A13 Correlation of macronutrient intake, physical activity, exercise habits with weight in Ketofastosis community members
Khayatul Afiyah, Anugrah Novianti and Nadiyah

A14 Prenatal circadian preference and its association with new-born sleep outcome: a prospective observational study
Lee YJ and Satvinder K

A15 Nutritional status and its association with quality of life of non-government institutionalised elderly at Georgetown, Penang
Maryam M and Rohana AJ

A16 Rapid assessment tool for Malaysian infants and young children feeding during an emergency: validity and usability
Ng CK, Sameeha MJ and Wong JE

A17 Perceptions of preschool teachers in implementing The ToyBox Study Malaysia intervention
Noor Hafizah Y, Farra Aidah J, Najwa WN, Denise DK, Ruzita AT, Poh BK and Gibson EL

A18 Prevalence of food insecurity and its relationship with socio-demographic characteristics, psychosocial health status and academic performance among undergraduate students in Universiti Putra Malaysia
Nor Syaza Sofiah A, Norhasmah S and Sabri MF

A19 The feasibility training of trainers (ToT) for *warga emas sihat* (WESIHAT) program to improve the quality of life among senior citizens
Norazman AZ, Yahya HM and Shahar S

A20 Determinants of serum 25-hydroxyvitamin D concentration in Malay workers in Kelantan
Norliyana A, Wan Mohd Izani WM and Hamid Jan JM

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A22 Sex differences in body composition among University students
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A24 Knowledge, attitude and practice on nutrition and family planning and its association with body weight status among undergraduate students in Universiti Putra Malaysia
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A25 Factors correlated with fat-to-muscle ratio (FMR) among primary school children in Selangor and Negeri Sembilan
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A26 The development, validity and reliability of knowledge, attitude and practice (KAP) questionnaire towards "Frailty Intervention through Nutrition Education and Exercise (FINE)" program
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Nurul Natasha Z and Norhasmah S

A28 Prevalence of overweight and obesity among public university students in Peninsular Malaysia
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A29 Association between health literacy, sociodemographic and socioeconomic factors with body mass index (BMI) among secondary school student in Kota Bharu, Kelantan
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A30 Nutritional status among different types of vegetarians residing in Klang Valley areas
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A31 Nutrition education intervention using internet-based website and daily reminder via personal and group WhatsApp chats on young adult females with self-perceived negative body image
Aniss AA and Ramlah G

A32 Nutritional status among pregnant teenagers in Klang Valley
Rina SR and Norimah AK

A33 Changes of stunting among children below five years old in Malaysia from 2015 and 2019
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A34 Association of physical activity and stress level with weight status of secondary school teachers in Shah Alam, Malaysia
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A35 Chronotype, nutritional status and blood pressure level of undergraduate students
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A36 Prevalence of gestational weight gain: findings from maternal and infants cohort study (MICOS)
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A37 Assessment of nutritional status, dietary intake, level of physical activity and quality of life among housewives in Rawang, Gombak
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A38 Awareness of stevia as a sugar substitute among UiTM Shah Alam students
Siti Soraya ME and Intan Mutiara M

A39 Dietary nitrate intervention and effects towards c- reactive protein (CRP) level and cognitive function among middle-aged and older Malaysian adults in Segamat, Johor
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A40 Serum ferritin thresholds for determination of iron status among pregnant women in Selangor and Kuala Lumpur, Malaysia
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A41 Association between chronotype and chrononutrition profile with weight status among adults
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A43 Association between pre-bedtime screen media activities with sleep quality among pregnant women
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A44 Association of energy intake and obesity in mothers and their children from selected primary schools
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A45 Neighborhood environment and physical activity level of UCSI University students
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B01 Major food sources of calories and macronutrients: quantitative data from Malaysian Adolescents Nutrition Survey (ANS 2017)
Ahmad Ali Z, Ruhaya S, Cheong SM, Azli B, Lalitha P, Mohamad Hasnan A, Norsyamlina CAR, Suhaila AG, Syafinaz MS and Munawara P

B02 Major food sources of micronutrients: quantitative data from Malaysian Adolescents Nutrition Survey (ANS 2017)
Ahmad Ali Z, Cheong SM, Ruhaya S, Suhaila AG, Lalitha P, Azli B, Norsyamlina CAR, Mohamad Hasnan A, Nur Shahida AA and Jayvikramjit S

B03 Validity and reliability of web based interactive dietary assessment tool among university students in UniSZA
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B04 Determination of meal provision appropriateness based on therapeutic diet among inpatients at Hospital Universiti Sains Malaysia (Hospital USM), Kota Bharu, Kelantan
Anis M and Rosminah M

B05 Relative validity of food frequency questionnaire (FFQ) on 3-day diet recall among older adults
Mohamad Hanief Ikhwan AZ, Siti Nur'asyura A and Camilla Wahida N

B06 Associations between breakfast consumption and body composition indicators among school-aged children: a sample from urban poor community settings in Malaysia
Cheah JMH, Chin YS, Hazizi AS and Lim PY

B07 Knowledge, attitude and practice of periconceptional folic acid usage among women delivered at Hospital Universiti Sains Malaysia, Kelantan
Chong KM and Tengku Alina TI

B08 Gender and age differences in diet diversity among Aboriginal school children in Negeri Sembilan
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B09 Consumers' perceptions of healthy food availability in online food delivery applications (OFD apps) and its association with food choices among public university students in Malaysia
Eu EZR and Sameeha MJ

B10 Association between dietary vitamin D intake and hemoglobin concentration among female students in Faculty of Medicine and Health Sciences, Universiti Putra Malaysia
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B11 Associations of personal factors, maternal factors, and mother-daughter interaction with disordered eating among female adolescents in Petaling Perdana, Selangor
Foo SY, Chin YS and Chow CM

B12 Accuracy of self-reported food intake among primary school children aged 7-9 years
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B13 Correlations of socio-demographic characteristics, parental feeding practices, parents' milk intake and children eating behaviours with milk intake among primary school children
Lee CW and Chin YS

B14 Association between picky eating behaviour with weight status and cognitive function among schoolchildren in Kuala Lumpur, Malaysia
Mok KT, Satvinder K and Tung SEH

B15 Correlates of healthy eating-self efficacy among secondary school students in Kuala Lumpur, Malaysia
Ng KL, Safiah MY, Shamala R and Chong SL

B16 The effects of bitter taste sensitivity on parent-reported vegetable intake and liking in children
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B17 Association between dietary calcium intake and hemoglobin concentration in female students in Faculty of Medicine and Health Sciences, Universiti Putra Malaysia
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B18 Eating behaviour and its association with anthropometric indicators among secondary school teachers in Shah Alam, Selangor
Nurul Balquis A, Sarina S and Sairah AK

B19 Factors influencing food preferences among international students in Universiti Putra Malaysia
Nurunnisa KE, Norhasmah S and Gan WY

B20 Association between food choices in school canteen and weight status of aboriginal children in Negeri Sembilan
Oeh ZY, Vaidehi U, Silambarasi K, Divanirsh D, Tan LX, Chieng WN, Eng ZY, Lim LS and Tay JL

B21 The prevalence of breakfast consumption and its relationship with body weight status among primary school children
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B22 Determination of spatial distribution of types and quality of food and beverage outlets available onsite and around major public hospitals in Kota Bharu, Kelantan: Geographic Information System (GIS) analysis approach
Pang GW, Lim KP, Tan YJ and Foo LH

B23 Assessment of sugar consumption pattern among primary school children in Kuala Lumpur
Phuah YS and Norimah AK

B24 Association between disordered eating and health-related quality of life among university students in Klang Valley
Presanna A, Sharifah Intan Zainun SI and Chin YS

B25 Prevalence of geriatric malnutrition and its associated factors among residents at Rumah Seri Kenangan Cheras Selangor
Putri Nabila Zulfakar and Noraida Omar

B26 Diet quality and eating habits among adolescents from secondary school of urban and rural areas in Sandakan, Sabah
Razalee S and Ojilah N

B27 Association between eating behaviours and weight status of picky eaters and non-picky eaters among Malaysian children aged 5 to 10 years old
Sabrina Premila JL and Tan ST

B28 Diet quality of aboriginal children in Negeri Sembilan
Silambarasi K, Sharifah Intan Zainun SI and Vaidehi U

B29 Development of healthy menu at minimum cost for older adults in Selangor using Diet Optimization Model
Sudin S, Yahya HM, Rajikan R and Elias SM

B30 Validity and reliability of a short form food frequency questionnaire among university students in UniSZA
Syaidatul Akmar Yusof and Mohd Razif Shahril

B31 Relationship between parental nutrition behaviour and children food habits and physical activities in Negeri Sembilan
Tan LX, Vaidehi U, Silambarasi K, Oeh ZY, Divanirsh D, Chieng WN, Eng ZY, Lim LS and Tay JL

B32 Assessment of food environment of public schools cafeteria in Kota Bharu, Kelantan: Quantitative analysis approach
Tan YJ, Lim KP, Pang GW and Foo LH

B33 Factors associated with mindful eating among undergraduate students in Universiti Putra Malaysia
Wan Nuratika Wan Zainulabidin and Gan Wan Ying

B34 Assessing validity of MY Food Album™ as a food portion size estimation kit in dietary assessment among adults
Tan CF and Wong JE

B35 SEANUTS II Malaysia: Strategies to overcome the challenges of dietary analysis in a children's nutrition survey
Yeo GS, Chia JSM, Ang YN, Christine J, Ika Aida AM, Salsabila RA, Nurul Hasanah HC, Chan KS, Wan Siti Fatimah WAR, Siti Hanisa A, Anis Syuhada A, Teh SC, Teh KC, Noor Afifah AR, Lee ST, Jamil NA, Wong JE, Nik Shanita S and Poh BK on behalf of the SEANUTS II study group

B36 Satiety scores and subsequent food intake of selected breakfast cereals in Universiti Kebangsaan Malaysia
Zalifah MK and Nur Aida Afida AR

Group C: Nutrients & Other Components in Foods/Products

C01 Nutrigenomic on palm phytonutrients
Ab Fatah M and Phooi Tee V

C02 Effect of soaking and boiling on the proximate composition and anti-nutrient content (*tannin*) of little millet (*panicum sumantrense*) and barnyard millet (*echinochloa frumaentacea*)
Anis Suraya Adnan and Siti Raihanah Shafie

C03 Sugar profile of Malaysian multifloral and monofloral Kelulut honey in comparison with Apis bee honey
Arif Zaidi J, Norra I and Nor Fadhilah S

C04 Determination of mineral and vitamin c contents in *amaranthus dubius* (red spinach), *spinacia oleracea* (green spinach) and *alternanthera sissoo* (brazilian spinach)
Dalila N and Norfarizan-Hanoon

C05 Survey on salt content through food labels of savoury snack products
Faarahanim Z and Hasnah H

C06 Determination of mineral content of little millet (*panicum sumantrense*) and barnyard millet (*echinochloa frumaentacea*)
Harriet Anabelle Anak Manggon and Siti Raihanah Shafie

C07 Lycopene, total carotenoid and total flavonoid contents in lycopene-rich drink
Nur Hasnisa H, Mohamed Nazim A and Hadijah H

C08 The Chemical Analysis of Camellia and Non-Camellia Teas
NA Saidin, HF Mohsin and I Abdul Wahab

C09 The phytochemical profiling of Trigona honey in Malaysia: a review
Siti Amalia Mohd Azam, Ahmed Mahmoud Ahmed Alafeefy and Ibtisam Abdul Wahab

C10 Determination of total phenolic content, total flavonoid content and antioxidant activities by cold aqueous, ethanol and methanol extractions of barnyard millet (echinochloa frumaentacea)
Izzah Madihah Hannah Bostamam and Siti Raihanah Shafie

C11 Protective effects of bioactive substances extracted from red pitaya (Hylocereus polyrhizus cv. Jindu)
Khoo HE, He XM, Sun J, Li Z, Li L, Li JS and Ismail A

C12 Determination of vitamin C content in breast milk and its relationship with maternal diet and psychological state
Mawarni A, Siti Raihanah S and Nurul Husna MS

C13 Effect of shaking on the content of calcium in selected calcium-fortified milk
Nur Farhanah O and Mohd Redzwan S

C14 Overripe banana as a functional ingredient in developing high dietary fibre and low glycaemic index cookie
Ng YV, Tengku Alina TI and Wan Rosli WI

C15 Mineral composition and dietary fiber of popularly consumed rice-based meals
Nur Ayuni U, Marina A.M and Wan Rosli Wan I

C16 The prebiotic potential of kuini juice
Nur Baizura S, Saiful Bahri S, Syahida M, Hadijah H and Yangmurni Z

C17 Determination of carbohydrate composition in breast milk and its association with infant's growth and behavior
Nuruljannah Mohamad Nasri, Siti Raihanah Shafie, Armania Nurdin and Nurul Husna M. Shukri

C18 Polyphenols content and antioxidant activity of *Mangifera odorata*
Ramli NS, Hamid, A, Karim, R and Lasano NF

C19 Evaluation of antioxidant activities and phytoconstituents in the crude oils of Pulasan and Salak By-Products
Rennusha M and Tan ST

C20 Dietary fiber and proximate composition of MARDI rice varieties
Sabeetha S, Hanisa H and Mohd Firdaus S

C21 Determination of proximate and fatty acid compositions, chlorophyll and carotenoids contents of *Haematococcus pluvialis*
Wong HY and Yim HS

C22 Survey on salt content in food products of fast food restaurants in Klang Valley
Zainorain Natasha ZA and Hasnah H

Group D: Clinical Nutrition/Intervention Trials

D01 Associations between sociodemographic, clinical factors, nutritional status, dietary intakes and bone quality with serum phosphate level among hemodialysis patients
Ng PC and Chan YM

D02 Effect of vitamin C supplementation on lipid profiling and oxidative stress in type 2 diabetic patients: A randomised placebo-controlled trial study
Faisal Ali and Gamil Othman

D03 Colonic fermentation of isomaltulose in healthy Malaysian adults: a single-blind, randomised, crossover pilot trial
Ng XQ, Megan CHZ, Shyam S, Tan SS and Ong JW

D04 Effects of interesterified margarine rich in palmitic (IEPalm) and stearic (IEStear) on inflammatory markers in healthy adults: a parallel human study
Ng YT, Voon PT, Ng TKW, Lee VKM, Miskandar MS and Norhaizan ME

D05 Maternal factors, social support and breastfeeding practice in relation to psychological state among mothers of hospitalised infants
Nurul Husna MS, Olivia S, Buganna SK, Zurina Z, Maslina M and Farah ISA

D06 Patient-related factors and adherence to antiretroviral therapy among HIV patients in Ahmadu Bello University Teaching Hospital Zaria Nigeria
Rosemary Ada Eze, Norhasmah Sulaiman, Zulfitri 'Azuan Mat Daud and Aliyu Babadoko

D07 Prevalence of undiagnosed hypertension and its associated factors among the university staff
Tee CM, Cheng SH, and Singh A

Group E: Food Science & Technology

E01 Physicochemical analysis and sensory evaluation of different flavoured goat milk yoghurt
Afaf SAH, Napisah H

E02 Isolation and identification of rhizosphere soil bacteria from rice varieties grown under greenhouse environment
Agubata, ZC, Ubani E, Okeke G and Udo C

E03 Physico-chemical and techno-functional properties of papaya (*Carica papaya*) dietary fibre fractions
Carew IE, Muhammad K, Gannasin SP and Fadhil Ayfan M

E04 In-vitro bioaccessibility of spray-dried refined kenaf (*Hibiscus cannabinus*) seed oil applied in coffee drink
Chew SC and Nyam KL

E05 In-vitro digestion of refined kenaf seed oil microencapsulated in β-cyclodextrin/gum arabic/sodium caseinate by spray dryingapplied in coffee drink
Chew SC and Nyam KL

E06 Texture modification of dairy-based foam and emulsion mixed beverage system: The effect on perceived satiation and satiety, and its potential implication in weight management
Goh WDY, Chong LC, Yan SW and Mohd Noor MI

E07 Physicochemical and nutritional properties of steamed bread fortified with resistant starch
Hasmadi M, Noraidah H, Jau-Shya, L and Ramlah R

E08 *Preparation and sensory evaluation of microwaved mushroom crackers with herbs and spices*
Jamilah WH and Khattak MMAK

E09 Influence of geographical origins and extraction methods on the antioxidant properties of Kundang by-products
Loh J and Tan ST

E10 Glycaemic response to brown rice cooked using rice cooker and draining method
Michelle NQY, Misra S, Chang SK and Segar H

E11 Dietary fiber of pineapple (*Ananas comosus (L.) Merr.*) wastes and its resistance towards α-amylase and stomach acid juice in vitro
Feadlind Dammia R and Mohd Redzwan S

E12 Production of water soluble *Heterotrigona itama* propolis powder: evaluation of their antioxidant properties
Norra I, Arif Zaidi J, Noor Fadilah MB, Sabeetha S, Norhartini AS, Nor Fadhilah S, Aida M, Nurul Nabilah MF, Aishah MR and Nur Intan Farina S

E13 Sensory evaluation of rice straw (*volvariella volvacae*) mushroom mixed with spices and herbs crackers by air frying method
Nur IFI and Muzaffar AKK

E14 Proximate composition and sensory evaluation of noodles made from wheat flour and composite barnyard millet flour
Nur Irsalina Mohamed Zaki and Siti Raihanah Shafie

E15 Sensory evaluation of rice straw mushroom mixed with herbs and spices crackers by pan-frying method
Nur RW and Khattak MMAK

E16 Effect of gamma irradiation on proximate composition, antioxidant content, and activities of *Carica papaya L. var. sekaki*
Nur Asyra Azrin A, Nur Asyiqin MZ and Nurul Husna S

E17 Effect of gamma irradiation on proximate composition, antioxidant content, and activities of Musa paradisiaca Formetypica L. var. nangka
Nadhira I, Chan YY and Nurul Husna S

E18 Physicochemical, sensory and antioxidant properties of persimmon (*Diospyros kaki L.*) leaves cookies
Ramlan NAFM, Zaini NS, Mohammad SM, Ramli NS and Zawawi N1

E19 Sensory evaluation in determining consumers' acceptability of rice straw mushroom crackers mixed with herbs and spices
Remlan NI and Khattak MMAK

E20 Glycemic response of white rice using rice cooker and draining method
Segar H, Michelle NQY, Snigdha M and Chang SK

E21 Palm mid fraction raise postprandial glucose dependent insulinotropic polypeptide (GIP) level compared to shea butter
Voon PT, Toh WH, Tony Ng KW, Verna Lee KM, Yap SY and Nesaretnam K

E22 Nutritional, sensorial and technological characteristics of synbiotic yogurt drink enriched with prebiotic inulin
Soh JEX, Malvino W and Yan SW

Group F: Experimental Nutrition

F01 Anti- thrombolytic activity of zingerone against high fructose diet induced non-alcoholic steatohepatitis in rat model
Jegathambigai R Naidu and Poshne Sasidharan

F02 Profortil prevents some of the leptin-induced adverse effects on sperm in Sprague-Dawley rats
Malik IA, Durairajanayagam D and Singh HJ

F03 Synergic effect of vitamin D supplementation and PARP Inhibitors on TNBC cell line proliferation
Wong FH, Amini F and Ng ESC

F04 Safety assessment of a novel plant-based milk alternative from kenaf (Hibiscus cannabinus L.) seeds through acute oral toxicity study
Nur Syamimi Z, Roselina K, Ahmad Faizal AR and Zawawi N

F05 Cytotoxicity assessment of Ceri Terengganu and Kuini extracts against cancer cell lines
Nurhazwani S, Hadijah H, Tun Norbrillinda M, Aishah MR and Mohd Shukri MA

F06 Antiulcer activity of Spirulina platensis and golden kiwifruit extracts on indomethacin-induced gastric ulcer in rats
Sami A. Althawb, Ibrahim S. Aleid and Hassan Barakat

F07 The effect of taking instant vegetable cereal on blood enzymatic antioxidant in aged rats
Syahida M, Zuwariah I, Faridah H, Norhafiqa MH and Nur Hasana Y

F08 Subacute oral toxicity of spiced heritage drink and its low-sugar version in Sprague-Dawley rats
Zayapor MNI, Aminah A, Wan Aida WM and Syahida M

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1. Huynh DTT et al. J Hum Nutr Diet (2015), 28, 623-635. Longitudinal growth and health outcomes in nutritionally at-risk children who received long-term nutritional intervention.
2. Huynh DTT et al. 5th International Conference on Nutrition & Growth 2018. Oral nutritional supplementation improved linear growth in Filipino children at nutritional risk.

* Optimum nutrient absorption referring to fats absorption, DHA, Vitamin A, calsium & others vs other formula without unique vegetable oil blends. Ref: Nelson et Al (1998), Leit ry al. (2013) & de Souza et al. (2017)

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*National Health & Morbidity Survey, 2019
**Thomsen AB, et al. Eur J Clin Nutr 2004

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Abstracts

35th NSM Scientific Conference: Day 1

Keynote Lecture

Diet, happiness and longevity

Hardinsyah

Professor of Nutrition at the Department of Community Nutrition, Faculty of Human Ecology, IPB University; and President of Federation of Asian Nutrition Societies (FANS)

Longevity simply means a length of individual life. Not all adults want to live long because they are worried that if they live long and unhealthy it will be full of suffering for themselves and their families, even just enjoying life in bed or in a wheelchair. Studies reveal that there are various factors contribute to an individual's longevity, such as genetics, diet and nutrition, hygiene, exercise, access to health care, other lifestyle factors and crime. Diet and physical activity are strongly linked to longevity. Research has long suggested that following a Mediterranean diet — which includes plenty of fruits, vegetables, whole grains, nuts and healthy fats, and not much sugar— brings a host of health benefits, including a longer life. Chronic unhappiness may lead to early death as a result of over-activation of stress response mechanisms, increasing blood pressure and weakening the immune system. Unhappy people be more vulnerable to disease; and when people suffer from a serious illness, their capacity for happiness is impaired. This review support for diet and happiness to be indicators of well-being that should be used more widely in social and health researches and programs. In summary, quality diet and happiness result in longevityg

Symposium 1: Maternal, Infant and Young Child Nutrition

Management of gestational diabetes in Malaysia - solutions and challenges

Sivalingam Nalliah

International Medical University Malaysia, Kuala Lumpur

The definition of gestational diabetes mellitus (GDM) has been retained for several decades as 'any degree of dysglycemia that is detected for the first-time during pregnancy'. The prevalence of GDM is 5.4% in Europe and that in Africa is 14.0%. In Asia, it ranges from 0.7% to 51% depending in the criteria for diagnosis and the type of test used in diagnosing GDM. Apart from disparity in diagnostic criteria, other factors like ethnicity, parity and age gave been quoted as reasons for these differences.

Tests done to determine hyperglycemia in pregnancy varies depending on the country of origin, with little consensus as to which screening tool should be advocated universally.

Currently diagnostic criteria that are commonly used are drawn from American Diabetes Association, IADSPG, American College of O&G, Diabetes I Pregnancy Study Group of India, Canadian Diabetes Association and the World Health Organization. Although 100g gm three-hour OGTT is popular in the USA as a two-step approach, in Asia, the 75-gm two-hour OGTT is by far more commonly adopted tool. The thresholds for diagnosis of GDM also vary. The IADPSG criteria, which are drawn from the HAPO study, appears to be more acceptable compared to the two step 100 gm OGTT criteria. Undeniably, these varied approaches have impacted on the reported pooled prevalence of GDM in each country. A single 2-hour plasma glucose after 75 gm glucose load has been used in India and there are ongoing studies if HbA1C would be a feasible alternative to conventional OGTT.

There has been a move to universal screening employing the 75gm OGTT during pregnancy for early detection of GDM in Malaysia, but there are several logistics, financial and psychological implications with such a move. Several risk factors have been associated with GDM and these have led to selective screening as an option in resource limited communities. Conventional wisdom has dictated the best time to screen for GDM as being between 24-28 weeks as insulin resistance to pregnancy hormones are best evaluated during this period. Although there are merits to this teaching, there are concerns about missing early onset hyperglycemia and the adverse impact it has on the growing fetus. The Malaysian Practice Guidelines on Diabetes in Pregnancy recommends screening for GDM early in mothers 'at risk'. In mothers >25 years with no risk factors, screening for GDM is advised at 24-28 weeks gestation. Cut-point for GDM have been fixed i.e. FBG >5.1 mmol/L and 2-hour levels >7.8 mmol/L. The WHO 2013 has a higher cut-off value for the 2-hour plasma glucose compared to the 1999 cut-off values!

The HAPO study and ACHOIS study have shown the risk of hyperglycemia on both mother and fetus in both short and long term. Clearly, there is a need to detect the presence of hyperglycemia early, and the best approach would be for a combined effort through increasing awareness of GDM, pre-conception counselling, early detection through screening using 75 gm OGTT and criteria based on local studies. Risk factors which are associated with GDM are previous GDM, congenital malformations miscarriages, stillbirth history, macrosomia, pre-eclampsia, age >25 years, obesity and BMI >25. When these risk factors are considered as indications for screening for GDM in Malaysia, more than 50% of antenatal mothers would be included. With the pooled prevalence rates >10-14% in Malaysia, clearly there is a role for universal screening for GDM, so as to introduce early interventions to reduce maternal and fetal complications. This statement is further supported by the escalating increase in both Type 2 DM and obesity in Malaysia and South-East Asia.

Once the diagnosis is established, management strategies of medical nutrition therapy, exercise, and medical therapy are instituted. Current issues are the need for community involvement in these approaches, as most care is totally rendered in health care facilities with little extension of lifestyle changes after the delivery of the fetus. Apart from reaching a consensus in adopting screening tools and timing of tests with regards to gestational age, there is a need for short and long term data collection so as to firm up the impact current criteria for GDM has on maternal and fetal outcome. Systematic reviews have shown 3.5 odds of developing GDM in those with previous GDM and a 7-fold increased risk of developing T2DM in the long term, in mothers who have been diagnosed with GDM. The increased odds of insulin resistance in GDM mothers who have had pre-eclampsia and macrosomia is 3 and 4 times higher.

Several challenges face practitioners managing GDM in regard to screening tools, cut-points, documentation of incidence of GDM and its complications and long- term management strategies in the afflicted population. Practice guidelines produced locally can play an effective role in addressing some of the issues, but such guidelines need acceptance by practitioners. Current use of OGTT appears to be the main approach to diagnosis, although there are variations in cut-points used in the criteria. Although higher pooled prevalence

of GDM is diagnosed when 75 gm glucose load for OGTT is reported, given the increasing incidence of GDM, such tests should probably be accepted as early interventions have been shown to reduce the complications of GDM in pregnancy.

Dietary prevention of allergic disease in infants and young children: How should we feed them?

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The prevalence of allergic diseases such as atopic dermatitis (eczema), food allergy, asthma, and allergic rhinitis has been increasing worldwide. Although the exact mechanisms responsible for this increase are still unknown, accumulating evidence clearly indicates that in addition to genetic predisposition, lifestyle changes and environmental exposures attributed to the urbanisation and industrialisation play an important role. There is currently no cure for allergic diseases, therefore effective primary prevention has become a public health priority in reducing its burden, especially in high-risk infants.

The gut microbiota plays an important role in immune development. Epidemiological findings identified consistent relationships between the early life dysbiosis of the gut microbiota and the subsequent development of allergic diseases. Manipulation of the gut microbiota may therefore offer an approach to the prevention of allergic diseases. The benefits of such natural microbial exposures are supported by nutritional or dietary strategies that programme the gut microbiota composition.

Early clinical practice guidelines recommended delaying the introduction of allergenic foods, such as cow's milk, egg, and peanut, until after the first year of life, in high-risk children. Emerging evidence has shown that these approaches are not effective in preventing food allergies, and in fact may contribute to the dramatic increase in the prevalence of food allergy in recent decades. However, recent findings from interventional studies have suggested an opposite approach, which promotes early introduction of potential food allergens into infants' diet to prevent food allergies. This presentation focuses on the latest high-quality evidence from randomised controlled clinical trials to support the paradigm shift for the early introduction of foods.

Invited Lecture 1

Sustainable innovation and contribution to nutrition

Cyndy Au and Victor Basuki

DuPont Nutrition and Biosciences, Singapore

All over the world, food consumption patterns are changing. Along with rising income, the demand for convenience in food preparations and ready-to-eat food increases. Consumers are expecting food to be tasty, affordable, convenient and nutritious as fundamental requirements. Nowadays, consumers especially in growing economies are expecting food to be all of that plus sustainable and ethically-sourced. This whole new way of thinking about food indicates that consumers are moving towards a far more innovative thinking progressively. This paper discusses on plant-based innovation as part of health seeking

behaviour and eating experience, impact of science and technology in creating value from food by-products and innovative solutions drawing from the age-old fermentation history to improve food safety and nutrition while maintaining quality and taste. This paper frames the discussion in the context of UN Sustainable Development Goals, response to consumer trends, motivation for ethical consumption and uses Trust Determination Theory to discuss the future of sustainable innovation in the food industry and its contribution to nutrition.

Invited Lecture 2

The role of oral nutritional supplementation in growth intervention

Siti Hawa Mohd Taib

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In the recent 2019 IMFeD Nationwide Childhood Growth Screening Campaign conducted by the Malaysian Paediatric Association, it was found that out of 17,574 children between 1-5 years old, 16% were stunted and 9.2% were underweight.

Poor growth is usually caused by inadequate nutrition which may lead to increased mortality due to infectious diseases, and impaired neurocognitive development in childhood and adolescence. In the long-run, undernutrition may lead to stunting in adulthood, lower education attainment, decreased income, and increased risk for chronic diseases.
Despite the importance of nutrition in child growth, the prevalence of children who do not meet their daily recommended intake for energy and micronutrients is still high. This is mostly due to imbalanced diet, which may be related to picky eating, and decreased appetite because of underlying illnesses.

The goal of nutrition intervention for children who are undernourished is to improve overall energy and nutrient intake to restore normal growth. Nutrition interventions can be conducted in several methods, including nutritional counselling, food fortification, oral nutrition supplementation (ONS), enteral feeding, and parenteral nutrition.

Oral nutritional supplementation (ONS), coupled with nutritional counselling, has been shown to have positive effects in treating and preventing undernourished children. Studies have shown that ONS improves several growth indicators, such as weight-for-height, weight-for-age, and height-for-age, significantly. Some children have also demonstrated increased resistance towards infections following nutritional intervention.

As a child begins nutritional support, the child must be monitored regularly. Some of the key pointers for monitoring include weight changes, linear growth, consumption of other foods, tolerance, adherence, and the perspective of parents or carers. For ONS to be successful, compliance and acceptance are of great importance. Therefore, proper assessment and monitoring of a child at risk of poor growth are essential when being treated for undernutrition.

The role of familial resemblance in peak bone mass attainment among Malaysian children

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It is important to track bone traits of prepubertal children up until their achievement of peak bone mass to identify susceptible inheritance of osteoporosis. This study aims to investigate the correlation of bone status with lifestyle factors of the children and their premenopausal mothers in Malaysia. Two hundred and forty-three pre-adolescent children (mean age=10.1±1.0 years) and their premenopausal mothers (n=163; mean age=40.3±5.9 years) were included in the study. For children, body composition, bone mineral content (BMC), and bone mineral density (BMD) at the lumbar spine (LS) and total body (TB) were assessed. Dietary intakes, physical activity level and sun exposure were assessed using validated questionnaires, respectively. Serum 25(OH) vitamin D was measured. For mothers, BMC and BMD were assessed at the lumbar spine (mLSBMD). Calcium and vitamin D intakes, physical activity level, sun index as well as knowledge, attitude and perceived behaviour (KAP) toward calcium intake were assessed using validated questionnaires, respectively. Significant correlation was found in son-mother pairs for vitamin D intake (r=0.425, p=0.001), skin area exposed to sunlight and sun index (BSA, r=0.240, p=0.009; sun index, r=0.289, p=0.032). No significant correlation was found between daughter-mother pairs for lifestyle factors. Heritability estimation by maternal descent (adjusted for weight, height and calcium intake) explained 21.4% variation for LSBMD in boys. Thirty-one point eight percent (31.8%) for LSBMD and 34.4% for TBBMD of the variation in girls were determined by maternal descent. No association was found between mother's KAP on calcium intake and children's bone status. These findings indicate that familial resemblance on bone status are detectable in early childhood among Asian children.

The association of serum adipokines and vitamin D level in newly diagnosed women with breast cancer: a case-control study

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This study was aimed to investigate the association of serum adipokines and vitamin D level with the risk of breast cancer. A case-control study was conducted on 78 women with newly diagnosed breast cancer and 86 healthy women, aged 21 to 59 years. Level of serum HMW adiponectin, visfatin, vitamin D and anthropometric parameters were determined. Mean serum adiponectin [2.9(1.6) vs 3.6(2.0)] and Vitamin D [14.5(7.5) vs 17.7(5.7)] concentrations were found significantly lower in cases group as compared to controls

group. The median serum visfatin of cases group was significantly higher than controls group [2.4(3.6) vs 1.7(2.1)]. Serum HMW adiponectin and vitamin D concentrations were found to be significantly associated with reduced risk of breast cancer (OR=0.79; 95% CI: 0.60-0.99, OR=0.90; 95% CI: 0.84-0.96). The risk of developing breast was 4.56-times (95% CI: 1.54-13.51) higher in women who had serum vitamin D <20 ng/ml as compared to those who had ≥20 ng/ml of serum vitamin D. Serum visfatin was seen to increase the risk of developing breast cancer in unadjusted model with OR=1.19 (95% CI: 1.01-1.39) although the association was insignificant after adjustments. We found that lower concentration level of HMW adiponectin and vitamin D may contribute to the development of breast cancer.

Food allergy mediates the association between maternal vitamin D status during late pregnancy and wasting in infants during the first year of life - a birth cohort study

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This study aims to determine the interrelationships of maternal vitamin D status during late pregnancy and feeding practices with childhood allergic diseases and malnutrition during the first year of life. Serum 25(OH)D concentrations of 380 third-trimester pregnant women were measured using a chemiluminescent immunoassay. Infant feeding practices and allergic outcomes were assessed at 3, 6, and 12 months based on parental reports. Infant's anthropometric data were extracted from medical records. Vitamin D deficiency (VDD) (<30 nmol/L) was observed in 42.8% of the pregnant women. About 46.6% of the infants were exclusively breastfed until 6 months, 97.1% had timely initiation of complementary feeding, 10.5% met minimum dietary diversity (MDD) at 6 months, and 54.5% met MDD at 12 months. About 27.6% of the infants had eczema and 20.8% had parent-reported food allergy (PFA). The prevalence of stunting, wasting, and underweight in infants showed an increasing trend over the first year of life, with the prevalence increased to 16.3%, 11.6%, and 7.6% at 12 months. The overweight prevalence remains constant, with 1.8% at 12 months. While no associations were found between feeding practices with any infant's allergic and malnutritional outcomes, results from a multivariable generalised linear mixed model showed that maternal VDD was associated with higher risk of PFA in infants after adjustment for confounding factors (OR=1.76, 95% CI=1.01-3.05). Meanwhile, PFA was associated with higher odds of wasting (OR=2.54, 95% CI=1.15-5.60). Results from the structural equation modelling showed that the relationship between maternal vitamin D status and wasting in infants was fully mediated by PFA after adjustment for confounders. This study demonstrates the important role of food allergy in explaining the relationships between maternal vitamin D status and wasting in early life. Besides considering vitamin D supplementation during pregnancy, infants with food allergy should be closely monitored to ensure optimal growth.

Determination of umami taste perception and habitual intake of glutamate among primary school children in Klang Valley

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Many widely-consumed Asian foods and condiments are rich in glutamate that provides the taste of umami. Hence, it is important to assess consumption of glutamate rich foods or the use of seasonings to monitor children's diet quality. This study aims to examine consumption of glutamate-rich local foods, frequency of seasoning use in home-cooked foods, and umami taste perception among primary school children in Malaysia. A total of 295 children (103 Malays, 94 Chinese, 98 Indians) aged 9-11 years were recruited from eight primary schools in Klang Valley. A five point scales with options of 'no', 'rarely', 'sometimes', 'often' and 'I don't know' was used to assess children's habitual intake of glutamate. Umami detection threshold was determined using two-alternative, forced-choice staircase procedure. Results showed that the most frequently consumed glutamate-rich local foods by meat/fish/seafood, cereal and cereal products, and vegetables categories were: fried chicken (32.8%), *roti canai* (31.0%), and vegetable soup (carrot and radish) (22.4%). Salt was the most frequently used seasoning in home-cooked food (74.5%), followed by soy sauce (30.6%) and chili sauce (14.2%). A large proportion of parents reported that no MSG (48.4%), soybean paste (49.8%), shrimp paste (59.5%) or fish sauce (67.0%) were used when preparing food at home. Except for MSG and tomato sauce, frequency of food seasoning used differs by ethnicity. Boys had significantly ($p<0.05$) higher umami detection threshold (1.49±1.39 mM) compared to girls (1.06±0.74 mM); no ethnic differences were observed ($p=0.832$). In conclusion, approximately one-third of school children frequently consumed glutamate-rich local foods in each food category, while soy sauce was the most common rich-in-glutamate seasoning used in home cooking. Girls have better taste sensitivity to umami compared to boys. Future studies exploring the association between umami taste sensitivity with total dietary intake may provide deeper insights into taste perception that influence behavioural outcomes.

Free Paper Presentation 1

Associations between prepubertal dietary intakes and puberty timing in boys and girls from the Avon Longitudinal Study of Parents and Children (ALSPAC)

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Early timing of puberty is associated with adverse health outcomes, particularly in women. To identify potential modifiable factors, we examined the association between prepubertal dietary intakes and puberty timing in boys and girls. In the Avon Longitudinal Study of Parents and Children (ALSPAC), macronutrient intakes at age 6 years were predicted using

linear random intercepts models, based on diet at 3, 4, 7 (assessed by food frequency questionnaire) and 7.5 years (by a 3-day food diary). Timings of puberty onset (Tanner stage 2 genital or breast (B2) development) and puberty completion (voice breaking (VB) or menarche) were determined from annual parental and child reports at 8-17 years on the Petersen Pubertal Development Scale. Age at peak height velocity (PHV) was derived from height measures at 5-20 years. Linear regression models were used to investigate the associations of total energy intake (TEI) and macronutrient intakes with puberty timing traits, adjusting for maternal and infant characteristics. Among 3811 boys, only higher TEI was associated with earlier VB (β= -0.94 per standard deviation (SD) increase, 95% confidence interval (CI): -1.65, -0.24). Among 3919 girls, higher TEI and substitution of dietary protein for carbohydrate in nutrient density models was associated with earlier B2 (β= -0.92 per SD increase, 95 % CI: -1.51, -0.33; β= -1.22 per SD increase, 95% CI = -2.03, -0.41), PHV (β= -0.50 per SD increase, 95% CI: -0.86, -0.14; β= -0.67, 95% CI: -1.15, -0.19) and menarche (β= -0.47 per SD increase, 95% CI: -0.89, -0.04; β= -0.58 per SD increase, 95% CI: -1.18, 0.01). Findings remained robust on additional adjustment for body fat percentage at 11 years. Higher childhood total energy and protein intakes, especially in girls, may promote earlier pubertal development through non-adiposity mechanisms. Further studies are warranted to identify potential influences of specific protein types.

Factors associated with sleep habits in children with Autism Spectrum Disorder

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Children with Autism Spectrum Disorder (ASD) commonly suffer from sleep problems due to presence of co-occurring physical and mental conditions and sensory sensitivities. These poor sleep habits exacerbate their core ASD symptoms and inhibit their social and learning skills. There was limited information on sleep habits of children with ASD in Malaysia. This cross-sectional study aimed to determine the factors associated with sleep habits in children with ASD at nine autism intervention centers in Kuala Lumpur, Selangor and Melaka. A total of 261 children (83.5% males and 16.5% females) with a mean age of 5.67±2.00 years and their mothers were recruited. A self-administered questionnaire on sociodemographic background, parenting style, parental feeding practices, parenting stress, autism severity and sleep habits were answered by the mothers. Body weight and height of the children with ASD were measured by the researcher in the centers. The mean sleep disorder score measured by the Children Sleep Habit Questionnaire was 52.77±12.59. A small proportion of the children were in the category of thinness (5.0%), whereas, 12.3% were overweight and 12.9% were obese. Multiple linear regression results showed that mother's employment status (B=4.081, 95% CI=1.569, 6.594, p<0.05), child's age (B=1.998, 95% CI=1.363, 2.632, p<0.001), permissive parenting style (B=0.274, 95% CI=0.013, 0.534, p<0.05), authoritative parenting style (B=-0.315, 95% CI=-0.608, -0.023, p<0.05) and parenting stress (B=-0.189, 95% CI=-0.237, -0.141, p<0.001) significantly predicted sleep disorder score in children with ASD. Intervention studies using an objective sleep-measuring method such as actigraphy and parent education programmes on parenting techniques should be conducted to improve sleep habits of children with ASD.

Measuring quality of life among women of reproductive age during Covid-19 pandemic

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Covid-19 pandemic was undeniably impacted many aspects of life. The implementation of movement restriction may trigger food insecurity in nutrition point of view, while social distancing may influence physical health, psychological and social relationship. The aim of this study was to assess the quality of life (QOL) of women of reproductive age during Covid-19 pandemic using World Health Organization Quality of Life Instrument (WHOQOL-BREF). This cross-sectional study was conducted in Java and Sulawesi Island, as both sites applied movement restriction policy. The Indonesian version of the WHOQOL-BREF as well as Food Insecurity Experience Scale questionnaire was self-administered online by 191 women using Google Form. Cronbach's alpha, Spearman rho's coefficient and Mann-Whitney test were used to analyse the data in SPSS version 25. Women who participated in this study were mostly aged under 30 years, live in urban area with nuclear family, had family income higher than 5 million IDR, held bachelor degree and on a state of food secured. Cronbach's alpha coefficient for the WHOQOL-BREF was 0.898 and significant correlation was found for each QOL domains as well as the two separate questions (Q1 and Q2). Food security scores were negatively correlated with social relationship and environment domains. The highest and lowest mean scores of QOL were observed in the social relationship (78.3) and physical health (60.8), respectively. Income and food security status were significantly associated with domain three and four ($p<0.05$). The reliability analysis in this study showed adequate degree of internal consistency of WHOQOL-BREF to measure QOL among women of reproductive age. Astonishingly, during quarantine women reported high satisfactory on social relationship. Overall, women who were participated in this study reported a relatively moderate quality of life.

Changes of body weight and body weight status: Impact of Movement Control Order during the COVID-19 pandemic in Malaysia

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The present study aimed to assess the changes of body weight and body weight status with the enforcement of Movement Control Order (MCO) during the pandemic of COVID-19 in Malaysia. This was an online cross-sectional study that involved 1,319 Malaysian adults, with participants self-reported their height, weight before and during MCO, and involvement in weight management strategies. A majority of the respondents were females (76.3%), Malays (44.4%), with an average age of 36.3±11.2 years. Before MCO, the prevalence of

overweight, obesity and underweight were 24.8%, 12.6% and 8.2%, respectively. During MCO, 14.8% of the underweight respondents and 9.5% of the overweight respondents had achieved normal weight, whereas 13.3% of the obese respondents had weight reduction and became overweight (χ^2=2876.008, p<0.0001). As for normal weight respondents, 4.5% and 1.5% became overweight and underweight during MCO, respectively. Specifically, 32.2% of the respondents' weight had reduced while 30.7% of the respondents had higher weight during MCO, with weight changes ranged from -12.0kg to +12.0kg. During MCO, there were 46.3% underweight and 30.1% normal weight respondents reported to have increased their weight, while half of the obese and 36.3% overweight respondents have weight reduction (χ^2=55.966, p<0.0001). When compared to before MCO, more respondents expressed that their eating pattern is healthier (41.0%) during MCO. While 28.6% were more active during MCO, there were a slightly higher proportion of the respondents self-reported as less active (36.4%). Further, the current findings showed that ethnicity (χ^2=12.705, p<0.05), changes in eating (χ^2=55.880, p<0.0001) and physical activity (χ^2=42.904, p<0.0001) patterns were significantly associated with body weight changes during MCO. In conclusion, a majority of the Malaysian adults had significant body weight changes during MCO, whereby their lifestyle changes were associated with the body weight changes. Healthcare professionals may take this opportunity in providing nutrition education in promoting healthy lifestyle and healthy weight management during the pandemic of COVID-19.

Anaemia among pregnant women attending antenatal care in Selangor: What are the determinants?

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Anaemia in pregnancy is an important public health problem as it is associated with poor maternal and perinatal outcomes. It is the most prevalent nutritional deficiency during *pregnancy*. According to WHO, in Malaysia, around 30% of women of reproductive age have *anaemia*. To date, there is no such study available to investigate the influence of household food security, gestational weight gain (GWG) and diet diversity on anaemia outcome among pregnant women in Selangor. This study aimed to determine the proportion of anaemia and its associated factors among pregnant women in Selangor. A cross-sectional study was conducted among 478 pregnant women aged 18 years, from 18 selected health clinics in Selangor between January to March 2020. All pregnant women with first trimester booking ≤12 weeks that fulfilled the inclusion and exclusion criteria were included in the study. A stratified multistage probability sample was performed. The household food security status using validated Malay version U.S Household Food Security Survey Module, sociodemographic, obstetric characteristics and diet diversity questionnaires were used. Data on obstetrical characteristics were extracted from the antenatal books. A total of 478 respondents were included in the study. Out of 288 studied respondents, almost 40.0% were anaemic. Multivariate analysis showed multiparity and above (AOR=1.721; 95% CI=1.118, 2.650; p=0.014); older age (AOR=1.651; 95% CI=1.027, 2.656; p=0.039), pre-pregnancy BMI overweight (AOR=0.601; 95% CI=0.371, 0.974; p=0.039), obese (AOR=0.418; 95% CI=0.258, 0.675; p<0.001), underweight (AOR=2.239; 95% CI=1.031, 4.865; p=0.042) were significantly associated with anaemia. However, household food insecurity, dietary diversity score and GWG were not associated with anaemia among pregnant women in this study. The identification the determinants of anaemia in pregnancy particularly modifiable determinants are important to improve maternal and foetal health.

Impact of The Sihat 365© Programme on awareness of healthy eating and physical activity among adults with prediabetes in community setting

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Lifestyle risk factors for prediabetes individual include overweight problem and physical inactivity. Therefore, the study was done to determine the impact of lifestyle intervention on awareness of healthy eating and physical activity among adults with prediabetes. A total 56 subjects aged between 18 to 60 years old, with body mass index (BMI) more than 25.0kg/m^2 were selected to participate in 24-week intervention programme called Sihat 365©. The Sihat 365© programme consists of a series of webinar and educational module, Pasaraya Sihat 365© tour, fun walk, focus group discussion (FGD) and the Sihat 365© Fitness Boot Camp. The programme aimed to increase awareness on healthy eating and physical activity among subjects. Study outcomes were measured at baseline and post-intervention including knowledge, attitude and practice (KAP) on nutrition, food label, physical activity, body composition and biochemical profile. At the end of the programme, 44 out of 56 subjects completed the post-intervention assessment. Overall, the subjects improved their awareness on healthy eating and physical activity. Percentage of obese subjects decreased from 52% to 48% at post intervention. The subjects demonstrated significant reduction on body weight, percentage body fat and visceral fat at post-intervention. For blood glucose profiles, mean HbAlc reduced slightly from 6.0±0.1mmol/l at baseline to 5.8±0.1mmol/l at post-intervention. However, there were no significant changes shown on the lipid profile. The findings indicate that The Sihat 365© programme has an impact on awareness of healthy eating and physical activity and improved the body composition among the subjects. We hope the present programme can be adopted at national level for diabetes prevention among Malaysian.

The associations between screen time and psychosocial wellbeing of pregnant women in Kuala Lumpur, Malaysia

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Psychosocial wellbeing is important especially for pregnant women as it can potentially affect both maternal and infant health. Growing evidence is emerging on sedentary behaviours particularly screen time as a risk factor for poor psychosocial wellbeing. As such, this cross-sectional study aimed to determine the associations between screen time (television, laptop, smartphone) with psychosocial wellbeing (depression, anxiety, stress) among Malaysian pregnant women. Overall, 240 women with a single pregnancy, aged between 19-40 years old and without any chronic diseases were recruited from nine Klinik Kesihatan Ibu dan Anak (KKIA) in Kuala Lumpur via convenience sampling. Sociodemographic data and screen time of electronic devices were self-reported using an adapted questionnaire. Psychosocial wellbeing was assessed using the Depression Anxiety Stress Scale-21 (DASS-21). On average, pregnant women spent 1 hour 44 minutes on

television, 1 hour 59 minutes on laptop and 4 hours 35 minutes on smartphone daily. Most of them (95.8%) had a high total screen time of ≥3 hours daily. Approximately 18% and 15% of pregnant women had mild-to-severe symptoms of depression and stress respectively. On the contrary, close to half (42%) had mild-to-severe symptoms of anxiety. Adjusted multiple linear regression showed that increased television screen time was associated with higher anxiety score (β=0.152, p=0.025). Furthermore, an increased smartphone screen time was associated with higher stress score (β=0.138, p=0.036). Findings suggested that screen time usage may affect the psychosocial wellbeing among the study population. Future studies should further investigate the changes/trend in psychosocial wellbeing in relation to screen time during pregnancy, particularly among populations exhibiting symptoms of depression, anxiety and stress.

Free Paper Presentation 2

Cluster analysis of macronutrient intake and DNA damage among Malay women

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The choice and the quantity of foods and supplements intake have a robust impact on all nutrients' body cellular concentration, affecting cellular functions, including DNA synthesis and repair**.** Body of evidence has shown that a balanced diet can decrease the oxidative DNA damage. An unbalanced diet may provoke the activation or deactivation of carcinogenic substances and leads to cancer development. This study was aimed to investigate the association of genotoxicity biomarkers and macronutrients (carbohydrates, protein, and fat). A cross-sectional study was conducted among 131 Malay women aged 18 to 50 years old. Participant's daily energy, macro, and micronutrient intake were extracted using a food frequency questionnaire. DNA damage, an indicator of genotoxicity, was measured as the percentage of DNA in the comet tail, where ≥10 indicates DNA damage. Data analysis was performed using a two-step cluster analysis. The two-step cluster solution model had a silhouette coefficient above 0.0, suggesting the validity of the within- and between-cluster distances. Based on the variables the three clusters were named i. higher DNA damage cluster (mean tail DNA of 19.73) (mean age 27.4) with a moderate amount of macronutrient intake (protein 120.2 g, fat 92.79 g, and carbohydrate 318.67 g), ii. normal DNA cluster (mean tail DNA of 8.76) (mean age of 29.34) with the lowest intake of macronutrient (protein 106.26 g, fat 75.03 g, and carbohydrate 271.82 g), iii. mild DNA damage cluster (mean tail DNA % of 10.37) (mean age 27.4) with the highest intake of macronutrient (protein 323.23 g, fat 260.78g, and carbohydrate 704.4g). In conclusion, our results indicate no significant association between dietary macronutrients intake and DNA damage.

Postprandial glycaemic response to isomaltulose in healthy Malaysian adults: a single-blind, randomised, crossover pilot study

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Isomaltulose (IM), a low glycaemic index (GI) alternative sweetener to sucrose that gives a steadier postprandial glycaemic response (PPGR) due to the relatively stronger α-1,6-glycosidic bond. Replacing part of IM with sucrose increases the affordability of IM-based

low GI products. However, whether this substitution would disproportionately affect enzymatic hydrolysis of sugar and the product's GI are unknown. This study evaluated the effect of substituting IM with sucrose in a 1:1 ratio on the PPGR of sixteen healthy Malaysian adults (9 men and 7 women; aged 20 to 27 years) with normal fasting blood glucose (4.9±0.2 mmol/L) and PPGR. They were randomly assigned with either 50 g of IM, 50 g of sucrose or 25 g of IM with 25 g of sucrose (IM+S) in 250-mL of water after overnight fast, with ≥3 days washout. Capillary blood samples were measured periodically for two hours (0^{th}, 15^{th}, 30^{th}, 45^{th}, 60^{th}, 90^{th} and 120^{th} minutes). IM demonstrated the lowest peak blood glucose level (6.47±0.10 mmol/L), incremental area under the blood glucose response curve (2h-iAUC) (118.36±16.83 mmol.min/L) and GI (37±5) (all $p<0.05$, except 2h-iAUC between IM and IM+S, $p=0.138$). IM+S only had significantly lower peak blood glucose level when compared to sucrose (7.90±0.18 mmol/L vs 8.66±0.21 mmol/L, $p=0.008$), with no significant different on 2h-iAUC (179.31±17.43 mmol.min/L vs 198.14 ± 29.65 mmol. min/L, $p=0.820$) and GI values (54±5 vs 56±5, $p=0.970$). Moreover, time to peak was not significantly different between the three sugars solutions (IM: 43.9±2.5 minutes; sucrose: 38.6±2.6 minutes; IM+S: 43.9±2.9 minutes, $p>0.05$). The present study suggested that PPGR was attenuated only when sucrose was completely replaced by IM, but not when replacing 50% of IM with sucrose (IM+S).

Identification of frequently available street foods to strengthen salt reduction action in Malaysia

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Street food has made a significant contribution to society in nutrition, especially in developing countries. Nutrition content in street food also depends on the ingredients used; how it is prepared, stored and how it is sold. The most widely cited definition of street food is ready-to-eat food and beverages prepared and/or sold by vendors and hawkers especially in streets and other similar public places. The retail location 'on the street' with no physical four permanent walls, distinguishes street food vendors from more formal food service. Street foods are likely to be high contributors of salt, given nearly two-thirds of Malaysians eat out at least once a day. The is a lack of comprehensive data on the sodium content of foods and meals, due to the absence of labelling requirements and outdated food composition data. This hindered effective implementation of consumer education. This study started with identification of the frequently available street food available in Malaysia. The survey of street food started at the Central zone of Malaysia, Kuala Lumpur. There are 14 night markets that have been surveyed from 8 districts in Kuala Lumpur (Bukit Bintang, Wangsa Maju, Kepong, Lembah Pantai, Seputeh, Bandar Tun Razak dan Cheras). Name, type and number of stalls selling the street food have been identified during the survey. All data was processed using SPSS to determine the frequency and ranking of the street food. The latter were divided into 3 categories which consisted of heavy meals, snacks and desserts. There were 15 top street foods that have been identified for each category. The following step will be the food sampling to determine the salt content in the street foods. The findings from this work will fill the knowledge gap needed to catalyse effective implementation of the salt reduction strategy.

Infants feeding practice and maternal experiences during COVID-19 pandemic in Malaysia: The COVID-19 Mom-Baby Study preliminary findings

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The COVID-19 pandemic has brought various impacts on human life around the globe. In Malaysia, the Movement Control Order (MCO) was introduced on 18th March 2020 to reduce the rapid spread of COVID-19, which this new-norm of life could have affected mothers and infants. Therefore, an online survey was conducted to study the impact of COVID-19 pandemic on infant feeding practices and maternal experiences. The survey was conducted from 1st July to October 2020 through social media. A total of 1053 mothers with infants aged ≤18 months participated in the survey. Data on feeding support and maternal experiences were compared between infants born before MCO (B-MCO; 69.2%) and infants born during MCO (D-MCO; 30.8%). The majority of women (mean age of 31±5 years) were Malay (72.9%), had Bachelor degree (40.5%), with a household income <RM4000 (44.0%) and practiced breastfeeding (64.0%). More mother-baby dyads of B-MCO (64.0%) experienced skin-to-skin contact directly after birth than 54.5% dyads of D-MCO (p=0.036), while more mothers who delivered D-MCO (22.7%) did not receive support or help with feeding in hospital compared to B-MCO (12.9%) (p<0.001). Infants born B-MCO were perceived by mothers as significantly more fussy (p<0.001), sleeping less (p=0.001) and showed an increased in appetite (p<0.001) compared to infants born D-MCO. Moreover, 19.3% B-MCO and 16.2% D-MCO mothers have been overeating (p=0.123), whereas 22.7% B-MCO and 20.9% D-MCO mothers have been feeling worried (p=0.419). More mothers who gave birth B-MCO reported feeling down (p=0.011) and tired (p=0.034) compared to mothers who gave birth D-MCO. In conclusion, the implementation of MCO has impacted feeding practices, support, as well as maternal mental health for both mothers who delivered B-MCO and D-MCO. Thus, increasing feeding and emotional support is important for infant's and mother's well-being, especially during the critical period of the pandemic.

The prevalence of serum 25 hydroxyvitamin D deficiency in nasopharyngeal carcinoma: a cross-sectional hospital-based study

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In nasopharyngeal carcinoma (NPC), chronic inflammation may block the production of vitamin D, which indirectly induces the progression of the tumour. This study reports the prevalence of serum 25-hydroxyvitamin D(25(OH)D) deficiency in 300 nasopharyngeal carcinoma (NPC) patients from two public hospitals in Malaysia. Serum 25(OH)D deficiency was prevalent among 23.7% of study subjects, while 44.3% had serum 25(OH)D insufficiency and 32.0% had sufficient serum 25(OH)D. There was a significant association between gender and serum 25(OH)D levels (χ^2=13.46, p=0.001).The prevalence of serum 25(OH)D deficiency was significantly high among overweight NPC cases (30.0%) (χ^2=9.48, p=0.014). The prevalence of serum 25(OH)D deficiency among obese NPC cases was 18.2%. A significantly higher proportional of NPC cases with serum 25(OH)D deficiency had a low

level of physical activity intensity (31.8%) (χ^2=6.99, p=0.023). The proportion of NPC cases with serum 25(OH)D deficiency was high among those with stage 3 cancer (26.7%) and those who underwent chemotherapy alone (27.3%). However, there was no association between the stage of cancer and the type of treatment across the subclinical level of serum 25(OH)D. Using multiple logistic regression, females were twice more likely to be diagnosed with hypovitaminosis D (AOR=2.39, 95% CI=1.28, 4.47). Overweight cases were significantly more likely to have hypovitaminosis D more than two-fold (AOR=2.76, 95% CI=1.09, 6.99). Multivitamins use, multiple treatments and low physical activity intensity were significantly associated with hypovitaminosis D, but not after control for confounding variables. This study shows evidence that serum 25(OH)D status was influenced by overweight and inactive female NPC cases when multivitamin supplements were taken and underwent combined therapy. Enhanced patient management and treatment should be provided to improve the outcomes for people with NPC.

Higher body fat percentage, BMI and waist circumference is associated with lower 25OHD concentration among pre-menopausal indoor female workers

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The prevalence of vitamin D insufficiency is shared globally, including Malaysia. Furthermore, it has long been associated with increased risk of cardiovascular disease and obesity. This study aimed to determine vitamin D status and its association with body composition among indoor women workers in Kuala Lumpur. A cross-sectional study was performed in Universiti Kebangsaan Malaysia, Kuala Lumpur. Sociodemographic data were collected using a self-administered online form. Anthropometric for body mass index (BMI) reading measures for height using a stadiometer (SECA 217, Germany), weight using a calibrated weighing scale (SECA 800, Germany) and waist circumference (WC). Body fat percentage (BF) was assessed using a handheld bioelectrical impedance meter (Omron Body Fat Analyzer HBF-306; Omron, Bannockburn, Illinois). Serum 25-hydroxyvitamin D (25OHD) was measured using an enzyme-linked immunosorbent kit (IDS EIA, UK). A total of 147 pre-menopausal indoor women workers aged between 24 and 54 participated in the study. Half of the participants were overweight (29.3%) and obese (21.8%). Mean serum 25OHD concentrations were 35.7±11.4 nmol/L. A total of 133 participants (90.5%) had insufficient vitamin D (25OHD <50 nmol/L; mean 25OHD = 33.2±8.3) with only 9.5% achieved the sufficient level (59.40±9.75). Vitamin D insufficient participants had significantly higher BF percentage (35.98±6.97), and higher BMI (26.68±6.89) compared to the sufficient group (35.93±3.20 %BF; 24.99±3.02 kg/m^2) (p<0.05). Vitamin D status did not differ in waist circumference between the two groups. The correlation between 25OHD and all three variables was positive and strong. BMI [r(144) = 0.82], BF [r(144) = 0.89] and WC [r(144) = 0.87], p<0.001. Further analysis using logistic regression analysis indicated that a 1% increase in body fat percentage increase the odds of having insufficient vitamin D <50nmol/L by 28% (p=0.048). Lower level of 25OHD concentration associated with higher body mass index, body fat percentage and waist circumference. Our finding suggests that maintaining a healthy body composition could reduce the risk of insufficient vitamin D.

SEANUTS II Malaysia: Mitigating the challenges of conducting a children's nutrition survey in the era of COVID-19 pandemic

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The South East Asian Nutrition Surveys (SEANUTS II) Malaysia team was in the midst of data collection when the World Health Organization (WHO) declared the COVID-19 outbreak as a pandemic in March 2020. SEANUTS is a multicentre nutrition survey involving children aged 6 months to 12 years conducted in four countries, namely Indonesia, Malaysia, Thailand and Vietnam. This presentation aims to share the unique challenges that arise from this unprecedented pandemic and our response as a research team. Data collection, which was on-going in the Southern region of Peninsular Malaysia, began to face new challenges with the rising number of COVID-19 cases in Malaysia circa January-February 2020. These challenges include adherence to strict safety and hygiene Standard Operating Procedures (i.e. limited pupils in an enclosed area, sufficient ventilation) that we had introduced; limited availability of protective equipment, including facemasks, sanitisers, infrared thermometer due to supplies issues; increased safety concerns of parents and children, and consequently, parents' hesitant consent during data collection. It was noted that the children, especially those aged below 2 years, showed uneasiness when researchers wore medical face masks while attending to them. To resolve these issues, the team (1) increased the level of good personal hygiene practices; (2) reduced the number of children per session to observe physical distancing; and (3) obtained parental confirmation that the children were well during data collection. Although we managed to complete data collection in Peninsular Malaysia prior to the Movement Control Order (MCO), the COVID-19 pandemic had unfortunately led to discontinuation of data collection in Sabah and Sarawak. This has impacted the representation of children from East Malaysia. Despite the termination of physical data collection, the pandemic situation had created a unique opportunity and need to assess the impact of COVID-19 pandemic on children's lifestyle behavioural changes through an online sub-study. The experience of the research team in conducting regular risk analysis in project management has helped to prepare the team in mitigating the impact of COVID-19.

The effects of *Cosmos caudatus* supplementation on neurodegenerative prevention among older adults with mild cognitive impairment

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Mild cognitive impairment (MCI) is a predementia condition that can be reversed to normal ageing with an appropriate intervention. The prevalence of MCI among older adults in Malaysia was 16% and prevention is crucial and timely. *Cosmos caudatus* was commonly consumed by Malaysian population and it has been reported to be rich in polyphenols and antioxidants which might have potential to exhibit neurodegenerative prevention properties. This study aimed to investigate the effect of *Cosmos caudatus* supplement on neurodegenerative prevention among older adults with MCI. This is a double-blind, placebo-controlled clinical trial among 48 subjects conducted for 12 weeks in Klang Valley, Malaysia. We screened the eligibility of subjects based on Peterson (2014) MCI criteria. We used validated tools to access cognitive function and brain activation such as neuropsychological batteries and task-based functional magnetic resonance imaging (fMRI). Elisa kits were used to analyse oxidative stress biomarkers at baseline and post intervention. Two-way mixed ANOVA analysis showed significant improvements in MMSE scores (partial η^2=0.150, p=0.049), serum malondialdehyde (MDA) concentration (partial η^2=0.097, p=0.047) and brain activation while performing 1-back task (partial η^2=0.396, p=0.016) were observed in supplement group. Furthermore, there was significant improvement in percentage mean change of Digit Span in supplement group as compared to placebo group ($p<0.05$). 12 weeks *Cosmos caudatus* supplementation has the potential to improve global cognitive function and brain activation and able to reduce oxidative stress among older adults with MCI. The scientific evidence from this study will trigger health promotion of *Cosmos caudatus* consumption that lead to healthy lifestyle and improve quality of life of older adults with MCI.

Symposium 2: School Child and Adolescent Nutrition

Nutrition Society of Malaysia (NSM) promotes school child nutrition

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Dual burden of malnutrition among Malaysian school children is one of the major public health concerns in Malaysia. Recognising this issue, it is imperative that nutrition education should be conveyed to school children as early as possible since lifelong dietary and physical habits begins to form during childhood. Therefore, NSM has been actively collaborating with various stakeholders in developing and conducting nutrition education programmes and researches, as well as publishing and disseminating nutrition educational materials. This paper shares the main interventions of NSM in promoting school child nutrition, which include the Healthy Kids Programme (HKP), Good Nutrition, Key to Healthy Children (GNKHC) and Malaysia School Nutrition Promotion Programme (MySNPP).

NSM conducted a 3-year longitudinal intervention study (Phase I: 2011-2013) to determine the effectiveness of a nutrition education module "Healthy Kids Programme (HKP)" in improving the nutritional status as well as knowledge, attitude and practice (KAP) of the children. The results showed that the HKP is effective in improving nutrition knowledge of the children. Besides, the content of the module that comprises of 18 topics on nutrition, hygiene and physical activity and its related interactive tools were well received by the students. From the research-oriented intervention in Phase 1, the nutrition education

intervention was expanded to reach more school children in Phase 2 (2014 – 2016) and was implemented in 77 day-boarding primary schools in East Malaysia using the developed module. A 3-year Training of Trainers (TOTs) workshop was given to 170 teachers and wardens who later educated 5000 students. In the Phase 3 (2017 – to date), a condensed version of 2-hour interactive educational session was conducted by nutritionists, which aimed to raise nutritional awareness in order to reach out to more students and schools and reduce burden on teachers for nutrition education.

Good Nutrition, Key to Healthy Children (GNKHC), is a multi-country nutrition education programme for school children, utilising a specially designed nutrition teaching module developed by five nutrition societies of the Southeast Asia Public Health Nutrition (SEA-PHN) Network, including NSM. The initiation of the GNKHC marks the collaborative effort of professional bodies and corporate partners in the region to work together in empowering school children with knowledge about healthy eating and an active lifestyle. In the GNKHC, a 2-day Training of Trainers (TOTs) workshop was conducted for selected teachers by nutritionists, then the trained teachers carried out a total of 9 lessons during physical education subject for Standard 3 school children within one school year.

In 2019, NSM has initiated collaboration with state nutritionists (PSPs) of Johore to expand the GNKHC module as part of the school nutrition promotion programme – Malaysia School Nutrition Promotion Programme (MySNPP). In the MySNPP, a 2-day Training of Trainers (TOTs) workshop was conducted for selected state nutritionists (PSPs). The GNKHC module will be used as the main nutrition education tool to train teachers in educating the school children, and the PSPs will prepare a series of nutritious meal plan for them to consume during school recess time. The application of multi-components of nutrition promotion programme through MySNPP is a more holistic approach in empowering the school children to apply nutrition knowledge and practise good nutrition in their daily life. It is hoped that the MySNPP will be the cornerstone of the school nutrition programme in Malaysia in improving the nutritional status of the school children.

Understanding Malaysian adolescents' perception of healthy eating and active lifestyle

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In Malaysia, a high prevalence of diet-related health problems, namely obesity and disordered eating, has been reported. Obesity and overweight are defined as abnormal or excessive fat accumulation that may impair health. Meanwhile, disordered eating can be defined as unhealthy eating and weight-related behaviours and attitudes that are of medical and/or psychological concern, however cannot be considered as eating disorders. The term 'disordered eating' is also used to describe dieting and unhealthy weight-loss behaviours. Dietary intakes and behaviours as well as physical activity levels and behaviours were shown to have substantial contributions to the overweight and obesity, as well as disordered eating problems. The correct perception and knowledge on healthy eating and active lifestyle are the key to healthy living among adolescents. Thus, it is very important to understand the adolescents' perception of healthy eating and active lifestyle, in order to plan effective and efficient future nutrition intervention.

This study is a needs assessment, a part of the development of "Eat Right, Be Positive about Your Body and Live Actively" (EPaL), a health education intervention to prevent overweight and disordered eating among Malaysian adolescents. The result of the present

study guided the development of the content and activities for the EPaL intervention. Using a quota sampling method, a total of 12 focus group discussions (FGDs) were performed at two secondary schools, which were randomly selected in Selangor. This study involved 72 adolescents (males=51.4%, females=48.6%) aged 13–14 years. Based on ethnicity, there was an equal number of Malay, Chinese and Indian participants (n=24, 33.3%). For analysing the outcome from the FGDs, thematic analysis was applied.

This study found that adolescents had some understanding regarding healthy eating and were able to relate healthy eating with the concepts of balance and moderation. The adolescents' perceptions of healthy and unhealthy eating were based on food types and characteristics, cooking methods and eating behaviours. Facilitators for healthy eating were parents' control on adolescents' food choices, feeling concern about own health and body, being influenced by other's health condition, and knowledge of healthy or unhealthy eating. On the other hand, barriers for healthy eating were the availability of food at home and school, taste and characteristics of foods, and lack of knowledge on healthy or unhealthy foods.

Regarding active lifestyle, the adolescents perceived exercise and physical activity as structured games.
They perceived that exercise could have positive effects on the body, appearance and health, and physical activity as a daily routine. Common differences between exercise and physical activity were based on frequency, intensity, energy and venue. Perceived facilitators in practising an active lifestyle include concern about body or health, have companions, familial or peer influence, availability of facilities in the neighbourhood and have scheduled time for exercise. Time constraint, no motivation, physically unwell or tired, no companion, security issue at playground or exercise facilities or venue, and weather were mentioned as barriers in practising an active lifestyle.

The findings of this study contribute to a better understanding of the adolescents' concept of healthy eating and physical activity, as well as the facilitators and barriers to practising healthy eating and active lifestyle. Future interventions should include a method of promoting the immediate benefits of healthy eating and active lifestyle, the way to cope with environmental barriers for healthy eating and active lifestyle, and increasing the availability of healthy food choices and facilities that support physical activity at home and in the school environment. The health and nutrition education programmes should also focus on educating parents, as they can be role models for adolescents to practise more healthful behaviours.

Invited Lecture 3

Catch up growth in undernourished children: The challenge and success

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The growth potential of an individual is determined by several factors such as dietary intake, biological condition, living environment and socioeconomic status. The dynamic interactions of these factors leads to a challenging situation in the prevention of malnutrition and correction of growth of the undernourished children. Ideally, a child is expected to follow a predetermined growth curve if condition is favourable. Failure to achieve the growth trajectory may lead to condition such as stunting and wasting where the child height is

below the normal height according to his or her age. However, when the period of retardation ends and favourable condition are restored, rapid acceleration of growth will occur. This growth pattern is termed as "catch-up growth". However, in the literature, catch–up growth is defined in many ways. Unstandardised definition creates challenge when comparison is to be made between studies by researchers. Furthermore, it is well documented that physical growth retardation is also associated with impaired neurodevelopment which is reflected as lower cognitive achievements in the children. Could rapid growth improvement also improve the child's cognition? Are there any successful interventions? To answer these questions, several intervention study findings will be discussed to share the best solution for this problem.

Invited Lecture 4

Roles & functions of beneficial microorganisms in the human gut

Alex Teo

Regional Director, Herbalife Nutrition, Research & Development and Scientific Affairs

It is important to understand that the gut microbiota that colonize and establish in different gut regions can influence many aspects of human health. In a healthy state, beneficial microorganisms have been shown to influence a balance between host's metabolism and immune functions. These beneficial microbes have been shown to contribute nutrients and energy to the host via fermentation of nondigestible dietary components within the large intestine. Conversely, when the optimal balance of healthy gut microbiota has been disrupted, negative consequences such as chronic inflammation and infection, allergies, gastrointestinal diseases leading to irritable bowel syndrome, diabetes mellitus and obesity can occur.

Increasingly, scientific studies have shown that our diet can exert major influence on the state of gut microbial ecology, which affect the overall human health in both short and long terms. Major breakthroughs have also been made in identifying the specific metabolic roles of those dominant microbes in the healthy intestines. Understanding the physiology of the dominant members within the microbiota community is important as this will usher in new possibilities for health manipulation using beneficial microbes via the gut system.

Invited Lecture 5

Isomaltulose (Palatinose™): Recent evidence for health benefits

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Isomaltulose (IM, trade name Palatinose™) is a disaccharide with the same monomers (glucose and fructose) as sucrose, but linked by an alpha-1, 6-glycosidic bond that undergoes

slower hydrolyses. Hence, IM is known as a slow, yet fully digestible carbohydrate that has a lower glycaemic index (GI) compared to sucrose. Review of recent literature found evidence for health benefits of replacing sucrose with IM. The low glycaemic property of IM finds clinical application in improving glycaemic control, sports and cognitive performance. Thus IM will find wide use in health foods. Studies have shown that Malays, who had the greatest glycemic response to sucrose, also showed the greatest improvement in glycemic response when sucrose was replaced with IM. In order to extend the Malaysian data and to study further the effect of substituting sucrose with IM, several pilot studies were conducted. These assessed in healthy Malaysian participants: 1. Postprandial glycaemic response to IM boluses; 2. Tolerance to IM and colonic fermentation of various boluses; and 3. Postprandial glycaemic response when IM substituted 50% of sucrose in a 50 g bolus (IM+S). Our findings reiterated that IM had low GI (37±5) and lower peak blood glucose and 2h-area-under-the-blood-glucose-curve (IAUC) than that for equivalent amounts of sucrose. Overall, IM when completely replacing sucrose attenuated postprandial glycaemic response, in a dose-dependent fashion. Data suggest that IM is a potential low-GI sucrose substitute for Malaysian food manufacturers owing to its lower postprandial glycaemic response and GI value.

Invited Lecture 6

Bioactives in palm oil as functional ingredients

Kanga Rani Selvaduray

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The world is moving towards increased awareness about healthy living. Almost on a daily basis we are bombarded with information about the ideal diet: what is healthy, what food is good or bad. Most consumers, however, are still confused about nutrition and the role of food in causing or preventing diseases. Food is not only a source of energy and tissue replacement; it provides one of the pleasures in life and plays an important role in every culture. Consumers rightly want to make informed food choices.

There are altogether 17 oils and fats, which are consumed by humans around the world. Eleven of these oils are based on vegetable oils like corn oil, sunflower oil, rapeseed oil, palm oil etc., while 6 are based on animal fats such as butter, fish oil and lard. Almost 85% of the world's palm oil production is used as food and this has meant that the nutritional properties of palm oil and its fractions must be adequately demonstrated. Palm oil has a balanced fatty acid composition, containing Palmitic acid (44%) which is the major saturated fatty acid in palm oil, 39% monounsaturated oleic acid and 11% polyunsaturated linoleic acid.

Palm oil also contains many phytonutrients or bioactive compounds, including carotenes, tocotrienols, tocopherols, phenolics, sterols, coenzyme Q10 and squalene which are essential for good health. These phytonutrients have antioxidative properties and some nutritional benefits beyond their antioxidant function. It is to be noted that 70% of vitamin E in palm oil occurs as tocotrienols and the remainder as tocopherols. To date, a number of nutritional studies have shown that tocotrienols reduce blood cholesterol, exhibit anticancer and neuroprotective effects. In addition, accumulating tocotrienols in tissue was proven to impart tremendous health benefits. Other phytonutrients such as carotenoids, the natural orange-red-colour pigment of palm oil that also act as precursors of vitamin A was found to prevent night blindness, improve vitamin A status of lactating women and their infants, improve serum retinol concentrations and combat vitamin A

deficiency. Furthermore, carotenoids can also protect against cardiovascular disease and suppress the growth of various cancer cells such as breast, lung, liver and colon tumours. Besides these, other minor components e.g. Co-enzyme Q10, squalene, polyphenols and phytosterols have also been proven to possess anticancer, cardioprotective properties and enhance immune functions. In addition, a bouquet of healthful water soluble bioactives has also been extracted and studies are underway to elucidate the health benefits of these conpounds.

These palm bioactives which are beneficial to health serve as an important functional ingredient in various food products.

Symposium 3: Food Environment and Technological Approaches in Nutrition

Food marketing and its impact on diets

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Food and beverage marketing, using numerous persuasive techniques, particularly to children is widely known to influence children's food preferences, purchase requests and food consumption. Many studies have shown that the type of food marketing on various platforms (television, billboards, movie theatres, bus stops near schools, supermarkets etc) were mainly unhealthy. Where the focus on the exposure and extent of food marketing was on television in the past 5-10 years, the recent platforms are now on social media such as Youtube and using social media influencers. The high percentage of unhealthy food being promoted is worrying as this may lead to the development of childhood obesity and non-communicable diseases (NCDs). In terms of food preferences and purchase requests, the author's study on pester power in Australian supermarket will be highlighted. In terms of the impact on diet, systematic reviews and meta analyses studies showed children increased their food consumption during or shortly after being exposed to television advertisements, product packaging, advergame and internet advertisements. A randomized trial in the UK showed that children who viewed influencers with unhealthy snacks had significantly increased overall intake (448.3 kilocalories [kcals]; P = .001), and significantly increased intake of unhealthy snacks specifically (388.8 kcals; P = .001), compared with children who viewed influencers with nonfood products (357.1 and 292.2 kcals, respectively). Viewing influencers with healthy snacks did not significantly affect intake. When benchmarked against gold standard, under food promotion, the Malaysian Food-Environment Policy Index (Epi) showed that the most important and achievable action (TOP 1) for the government to do is to enact a policy to restrict unhealthy food and beverage marketing, including sponsored education, sports and cultural activities in children's settings. International best practice benchmarks indicated that at least 4 countries worldwide (Chile, Spain, Uruguay and Hungary) implemented mandatory laws in this area. The regulations to restrict the exposure and power of broadcast promotions for unhealthy food and beverages to children (TOP 3) should also be emphasized by the Malaysian Government. Findings on some research work related to food marketing in Malaysia will also be shared.

Utilising technology to assess compliance with Dietary Guidelines: The CSIRO Healthy Diet Score survey

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National dietary guidelines are designed to improve the health and wellbeing of populations by promoting a pattern of eating to optimise health and reduce the risk of dietary deficiency and chronic disease. However, population dietary intakes globally are below dietary guideline recommendations, with common issues of underconsumption of vegetables and whole grains, and overconsumption of discretionary, energy-dense/nutrient-poor, choices.

Understanding current dietary patterns in the population, and subgroups of the population, helps to inform the development of interventions to improve eating habits. The CSIRO Healthy Diet Score survey is one of a few dietary assessment tools that are scientifically developed and freely available online (www.csirodietscore.com). Since its launch in 2015, over 230,000 Australians have completed the survey. It asks questions about the quantity, quality, and variety of foods consumed. On completion, individuals receive a personalised Diet Score—reflecting their overall compliance with the Australian Dietary Guidelines. The average score is 55.6 out of a possible 100. About 80% of individuals have low scores for discretionary choices, 72% for healthy fats, 71% of dairy foods, 45% for vegetables and 41% for fruit. Women tend to score higher than men; older adults higher than younger adults; and normal weight adults higher than obese adults. Individuals with the lowest diet quality scores are almost three times more likely to be obese than those with the highest score, with fruit, discretionary foods and healthy fats being the differential components between weight status groups. Most individuals (83%) have two to five areas of their diet that needs improvement, with men, younger adults and individuals with obesity more likely to have more areas of address.

The combination of using technology and providing the tool free of charge has attracted a lot of traffic to the website, providing valuable insights into what Australians' report to be eating. The use of technology has also enhanced the user experience, with individuals receiving immediate and personalised feedback. This survey tool is useful to monitor population diet quality and understand the degree to Australians' diets comply with dietary guidelines. Given the similarities in the food-based dietary guidelines between Australia and countries within the South East Asia region, there is an opportunity to explore the adaptation of this tool into this region. If implemented, this online survey could be an innovative and feasible approach to collecting comparable dietary intake across countries between Australia and countries within South East Asia and Oceania region.

Symposium 4: Physical Activity and Sedentary Behaviour

National Strategic Plan for Active Living (NASPAL)

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Regular moderate intensity physical activity such as walking, cycling or participating in sports has significant contribution to health and well-being of an individual including

physical fitness and mental well-being. The fact that physical inactivity is the 4th leading risk factor for global mortality is alarming. In Malaysia 1 in 4 adults are insufficiently active. Insufficient physical activity is also the main contributing factor to overweight and obesity. According to National Morbidity and Mortality Survey in 2019 1 in 2 Malaysians are overweight or obese. In relation to above, the National Strategic Plan for Active Living (NASPAL) is developed to activate initiatives, environment and policy that will boost Malaysians to be physically active. NASPAL was officially launched in conjunction with National Campaign - When Active Living Kicks (WALK) on the 3rd November 2018. One of the strategies in NASPAL is promoting and educating Malaysian to be physically active and reduce sedentary lifestyle. It is envisioned that with the successful implementation of all key strategies and policy options in NASPAL, Malaysia will have a well-informed population that is able to take responsibility for their own health by being physically active.

Physical activity behaviour among preschool children in Malaysia: preliminary results from the SUNRISE study

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This study aimed to determine the proportion of preschool children who meet the WHO's 2019 24-hour movement guidelines. This guideline includes three components, namely physical activity (PA), sedentary behaviour (SB) and sleep. The guideline states that children aged 3-4 years should participate in at least 180-minutes of PA a day including at least 60-minutes of moderate-to-vigorous-intensity PA (MVPA); should not be restrained nor have screen time of more than an hour; and should have 10 to 13 hours of sleep. Preschool children aged 4 years were recruited from urban and rural localities in central region of Peninsular Malaysia, including in Kuala Lumpur, Selangor and Negeri Sembilan. Physical activity was measured using Actigraph GT3X+ accelerometers, which was worn on the waist for 5 days, from Monday to Friday. Children with at least one 24-hour day of data were included in the analysis. Sedentary screen time and sleep time was measured via parents' questionnaire. A total of 82 children completed the study protocol. There was a good representation of boys (51.2%) and girls (48.9%), as well as from urban (52.4%) and rural (47.6%) areas. Accelerometer data showed that slightly more than half (57.3%, n=47) of the children participated in at least 180-minutes of PA daily. However, among them, only 30 (36.6%) participated in at least 60-minutes of MVPA. Only a small proportion of children met SB guideline with 23.2% sitting <60min and 26.8% having screen time <60min per day. All children from this study reported sleep time of more than 13 hours. Overall, only one child (1.2%) met all three components of the WHO guidelines. The low proportion of children who met the WHO 24-hour movement guidelines was due to the high prevalence of SB. Future PA interventions should include a component on reducing sedentary behaviour to promote a healthier daily routine.

Poster Presentations

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

A01 Demographic and socioeconomic characteristics in relationship to food insecurity among households living in People's Housing Programme (PHP) Klang Valley Malaysia

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Food insecurity exists whenever there is limited access to sufficient foods at all times for people to achieve an active and healthy life. Food insecurity was shown to be associated with poor nutritional outcomes but also indirectly linked with psychological problems especially among the children. This study aimed to identify the prevalence, demographic and socioeconomic characteristics with food insecurity among households living in PHP, Klang Valley, Malaysia. Food security status was assessed using Six-item U.S. Department of Agriculture (USDA) Food Security Survey Module (FSSM), while the demographic & economic status of the household was assessed by obtaining through a set of a self-administered questionnaire. A total of 315 women were selected through multistage random sampling throughout six zones of PHP located in Klang Valley, Malaysia. Women were selected to represent their households as women play the main primary caregiver in each household. The results show that 51.4% of the households were experiencing food insecurity, from which 33.9% were sub-categorized as low food insecurity and 17.5% as very low food insecurity. Food insecure was found to be significantly associated with mother's age (x^2=4.245, p<0.05), marital status (x^2=3.923, p<0.05), house ownership status (x^2=10.937, p<0.05), household size (x^2=7.801, p<0.05), husband's employment status (x^2=4.895, p<0.05), women's employment status (x^2=10.876, p<0.05), women's education level (x^2=10.598, p<0.05), received financial aid (x^2=45.892, p<0.05), household monthly income (x^2=26.927, p<0.05), household monthly expenditure (x^2=11.790, p<0.05) and household expenses on foods (x^2=54.151, p<0.05). In conclusion, the prevalence of food insecurity was considerably higher and this shall be an alarming sign for government and related authorities to tackle this issue and addressing the factors of food insecurity to lessen the impacts to the community.

A02 SWOT analysis in understanding the role of nutritionists in promoting optimal nutritional well being of Malaysians

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Nutritionists are trained to promote optimal nutritional well-being of the population and control nutrition-related diseases at different settings. This is a mixed-method study that involved a cross-sectional study at Phase I and a qualitative study at Phase II. The Phase I of the study aims to assess socio-demographic background and job-scope of nutritionists, while Phase II of the study aims to explore the role of nutritionists in promoting optimal nutritional well-being based on SWOT analysis. A total of 63 nutritionists answered an online survey form in the Phase I of the study, while five of them proceed with an in-depth

interview by researcher in Phase II of the study. The study showed that the most common roles of nutritionists were advocate nutritional well-being (82.5%), monitor and evaluate nutritional status (60.3%), and provide technical advice and consultations in nutrition and nutrition-related matters (58.7%). Majority of the nutritionists (76.2%) perceived their current job-scope fit in nutrition field. There were significant associations of company type (χ^2=12.108, p<0.05), work area (χ^2=5.968, p<0.05), and further study (χ^2=4.917, p<0.05) with perceived job fit. Based on the SWOT analysis, comprehensive nutrition trainings and fieldwork experiences were identified as the key strengths of nutritionists, while heavy workloads and lack of job opportunities were their weaknesses. The key opportunity indicated by the nutritionists was able to collaborate with multiple agencies, while the presence of unqualified nutritionists was considered as the key treat. Nutritionists were very positive with the Allied Health Profession (AHP) Act as the act will be able to protect their nutrition profession and make nutritionist to be recognised by the public. In conclusion, the present study highlighted that nutritionists are cleared about the roles and job-scope in nutrition. The findings can be considered when detailing out the implementation of AHP Act for nutrition profession and future training for nutritionists.

A03 Are older adults eating enough?

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Dietary intake is an important driving factor in the maintenance of overall health, especially among older adults. This study will aim to assess the dietary and nutrients intake of older adults in Malaysia. This cross-sectional study was conducted among 301 community-dwelling older adults aged 60 years and above, who resides in the urban-poverty setting. Subjects were selected based on the multistage sampling method from ten PPR *(Projek Perumahan Rakyat)* in Kuala Lumpur. The validated Dietary History Questionnaire (DHQ) was used to determine respondents' habitual dietary intake. The energy and nutrient intakes of respondents were compared against the Recommended Nutrient Intake of Malaysia (RNI). Dietary intake data were adjusted for energy using the residual method to minimize the misreporting bias. Independent sample t-test was performed to determine the mean differences of dietary intake across gender. The mean age of study respondents is 67.1±5.5 years old. More than half of the respondents were reported to be overweight (39.2%) and obese (25.9%) with a mean BMI of 27.52±5.48 kgm^{-2}. Upon administration, respondents were presented with high fasting blood glucose (37.5%) and total cholesterol (76.7%). Overall, the mean energy intake of the respondents was 1466±363 kcal. Males consumed significantly higher energy (1634±390 kcal) compared to females (1392±325 kcal). Similar patterns were observed for protein, carbohydrate and fat. When compared against RNI for Malaysian elderly; a majority of them achieved the minimum intake for energy and protein intake which were 90.45% and 120.82% respectively. However, most of the micronutrient intakes were not achieving the RNI recommendation namely, vitamin E, thiamin, riboflavin, niacin, folate, calcium, folate, magnesium, potassium and zinc. Despite achieving the recommended intake of total energy, micronutrient-deficient were of concern. This figure signifies the importance of emphasizing on a balance nutrient intake and assessment should not be confined to the energy and protein intake only.

A04 Association of gestational weight gain with social jetlag and sleep quality

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Gestational weight gain is important for pregnant women to optimise maternal outcomes by achieving targeted weight gain during pregnancy. In fact, the need to balance biological preferences in meeting the demands of lifestyle schedules leads to an alteration of sleeping patterns, producing a condition termed social jetlag. It may be linking to poor sleep quality that could play a role to gestational weight gain. Therefore, this study aimed to investigate the association between gestational weight gain with social jetlag and sleep quality to reveal the impact of circadian timing disruption on pregnancy. A cross-sectional study was conducted in seven government maternal and child health clinics in Kuala Lumpur, Malaysia. A total of 287 pregnant women completed questionnaires on sociodemographic, Pittsburgh Sleep Quality Index (PSQI), and Munich Chronotype Questionnaire (MCTQ). Maternal information was subsequently extracted from the participant's maternal health records. Results have shown that most pregnant women had an unhealthy gestational weight gain (78.4%), exhibiting both inadequate (69.0%) and excessive (9.4%) gestational weight gain. The prevalence of poor sleep quality and social jetlag among pregnant women was 55.4% and 56.1% respectively. Correlation between social jetlag with sleep quality ($r=0.146$, $p=<0.013$) and social jetlag with gestational weight gain ($r=-0.12$, $p=0.042$) was found. The presence of social jetlag was commonly found among those who have inadequate or excessive gestational weight gain compared to those of normal gains. In short, this study elucidates the presence of social jetlag among pregnant women who were generally experiencing abnormal gestational weight gain. More studies are warranted to further understand social jetlag and its role to improve gestational weight gain.

A05 Body balance and its relationship with physical activity level among older adults who practise Qigong

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Qigong is an ancient Chinese exercise that involves meditation, breathing techniques and slow movements. Qigong is associated with multiple health benefits including the improvement of body balance among the practitioners. The objective of this study was to examine the body balance and its relationship with physical activity level among older adults who practise Qigong. An 16-item Fall Efficacy Scale International (FES-I) and 9-item Rapid Assessment of Physical Activity (RAPA) were used to assess the confidence level of older adults in performing daily activities without falling and their levels of physical activity, respectively. These questionnaires were administered to residents of Ipoh, Perak aged 60 years and above who practise Qigong at least three times a week, 30 minutes every time for a minimum of two years. A total of 151 respondents (104 females, 47 males) with the mean age of 69.9±6.5 years participated in this study. The average body mass index was 23.3±3.3 kg/m^2, while 46 (30.4%) were overweight/obese and 8 (5.3%) were underweight. On average, the respondents spent 412±214 minutes per week in Qigong practice. The respondents recorded a mean body balance score of 23.6±10.9 with 54.3% (n=82) respondents reported that they had a low concern of falling. The body balance scores were significantly higher among the female (25.0±12.0) than the male respondents (20.6±7.5, $p<0.001$). The majority of the respondents (92.1%) were categorised as being physically active. Spearman correlation showed that there was no significant relationship

(r=-0.137, p=0.358) between the body balance and the level of physical activity of the respondents. While there was no link between body balance and physical activity, the study concluded that older adults who practise regular Qigong have a good level of body balance and active lifestyles.

A06 The association between early light exposure with chrononutrition among pregnant women

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Chrononutrition is imperative in synchronising our biological clock for optimal birth outcomes during pregnancy. With regards to this, light exposure may play a role in chrononutrition due to its ability in regulating circadian health (under normal light/dark cycle). The understanding on morning light exposure is much needed as it can modulate appetite, mood and energy level. Hence, this study aimed to determine the association between light exposure (timing and intensity) with chrononutrition (meal timing) among pregnant women. This was a prospective observational study with 242 pregnant women in 2nd trimesters was recruited. Socio-demographic data was collected. Anthropometric measurements were done using standard protocol in maternity clinics. Light exposure and chrononutrition data were assessed using H-LEA (Harvard Light Exposure Assessment) and three days food record respectively. Pregnant women were exposured to an average 6.26±4.47 hours on screen time, 4.59±1.47 hours of artificial white light, 3.25±1.40 hours of natural sunlight (indoors and outdoors) and 0.48±1.43 hours of dim artificial orange light. Besides, pregnant women in this study ate 2034±430 kcal and 4.18±0.78 meals daily. Their eating window was 11.51±1.28 hours while their last meal were 2.45±1.48 hours close to bedtime. Significant correlations ($p<0.05$) was found between early light intensity at 7am (r=-0.239) with total calories intake daily, while early light intensity at 7am (r=0.457), 9am (r=0.362), 10am (r=0.306) and 11am (r=0.314) were associated with eating earlier at night before bedtime. Adjusted multiple linear regression showed that lower light intensity at 7am was associated with higher calories intake (β=-0.368, p=0.030) and night eating (β=0.002, $p<0.001$). Findings suggested that higher early light intensity is linked with lower energy intake throughout the day and eating earlier at night. Future studies are needed to further understand the influence of early light exposure on maternal health.

A07 Prevalence of overweight and obesity among vegetarians and its associated factors

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The rates of overweight and obesity are increasing globally. The present cross-sectional study aimed to determine the prevalence of overweight and obesity and its associated factors

among vegetarians from the selected community centres in Kuala Lumpur and Selangor. Anthropometric measurements such as body weight and height of vegetarians were measured according to the International Society for the Advancement of Kinanthropometry (ISAK) protocol. Body mass index (BMI) was calculated as kg/m^2 and vegetarians were further classified into underweight, normal weight, overweight and obesity according to their BMI. The respondents were asked to complete a set of self-administered questionnaire, which comprised socio-demographic characteristics, vegetarianism practices, smoking behaviour, alcohol consumption, and physical activity. All collected data were analysed using IBM SPSS statistic version 24.0. The present study comprises of 273 vegetarians (males:35.2%; females:64.8%) with an average age of 47.5±13.1 years. About half (44.0%) of them were lacto-ovo vegetarians, followed by lacto-vegetarians (31.5%), vegans (19.0%) and ovo-vegetarians (5.5%), with an average of 14.2±9.6 years practising vegetarianism. The mean BMI of the vegetarians was 23.7±4.1 kg/m^2. The prevalence of underweight, normal weight, overweight and obesity were 9.5%, 54.9%, 27.5% and 8.1%, respectively. The present study found that overweight or obesity were significantly associated with longer duration of practising vegetarianism (t=-3.58, p=0.0001), being lacto-vegetarians (χ^2=25.94, p=0.0001), Indians (χ^2=35.06, p=0.0001), and married (χ^2=7.73, p=0.021). Nevertheless, there were no associations between smoking behaviour, alcohol consumption, and physical activity and overweight or obesity (p>0.05). Overall, overweight and obesity were common among vegetarians. The present study highlights an urgency to develop appropriate strategies for the prevention of overweight and obesity among vegetarians in Malaysia.

A08 Association between sleep quality and physical activity level among university students

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Poor sleep quality in university students has been associated with low physical activity level (PAL) due to sleepiness and high level of fatigue. The study aimed to determine the association between sleep quality and physical activity level of university students in Malaysia. A total of 370 university students aged 19 to 24 years were recruited via online platforms in this cross-sectional study. A self-administered questionnaire including Pittsburgh Sleep Quality Index (PSQI), Epworth Sleepiness Scale (ESS) and International Physical Activity Questionnaire-Long Form (IPAQ-LF) was used to assess sleep quality, daytime sleepiness and PAL. Height and weight were self-reported. More females (72.2%) than males (27.8%) with a mean age of 21.60±3.99 years participated in this study. More than half (53.2%) were defined as poor quality sleepers. One in five (20.8%) suffered excessive daytime sleepiness (EDS). University students slept longer on weekends (8.06±1.83 hours) compared to weekdays (7.39±2.54 hours). Meanwhile, about three-quarter (76%) were physically active. Highest PAL was found during leisure time (1029.74±1362.02 MET-minutes/week) but lowest during work time (335.31±1165.94 MET-minutes/week). Sleep duration was positively correlated with PAL from transportation (r=0.151, p=0.004), domestic chores (r=0.127, p=0.016) and leisure time activity (r=0.107, p=0.045). Students with better subjective sleep quality performed higher PAL during leisure time (r=-0.128, p=0.016). A greater extend of daytime dysfunction (r=-0.117, p=0.033), later bedtime (r=-0.112, p=0.033) and wakeup time (r=-0.266, p=0.001) contributed to poorer PAL. No correlations were found between ESS scores, PSQI scores and other PSQI variables with overall PAL. This study confirmed the high prevalence of poor sleep quality among university students. As sleep is essential towards health in general, education should emphasize on promoting healthy sleeping patterns for the betterment of long-term health among university students.

A09 Relationship between lifestyle and students' academic performance in private higher institutions in Klang Valley

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Current higher institution students 'nowadays are focus on their academic performance thus ignore the importance of healthy lifestyle as they have least knowledge of how it would effect on their academic performance. The objective of this research is to examine the relationship between lifestyles and student's academic performance among higher education institution students. This research focuses these factors: breakfast habits, physical activity and sleep habits and their relationship on academic performance of students. Quantitative method was used and questionnaires which consist of 23 sets of questions have been distributed to 124 respondents from selections of higher institutions in Klang Valley. The results show that breakfast habits, physical activity and sleep habits has a strong significant positive relationships with academic performance among higher education institution students in Klang Valley. Future studies are recommended for studying the combined factors that effect on the academic performance among higher education institution students.

A10 Characteristics of weight and BMI changes among individuals who perceived to experience an intentional weight loss: a preliminary finding from a Malay majority population

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Malaysia is listed as one of the topmost countries with large number of people living with overweight and obesity. However, in managing the disease, there is a lack of scientific data on the success rates of losing weight and weight changes characteristics among people living with overweight and obesity. Therefore, this study aims to examine the characteristics of weight and BMI changes among individuals who perceived to experience an intentional weight loss. Potential study respondents were invited to the study via social media and the data was collected primarily using a self-administered online questionnaire after an informed consent was obtained. All weight and BMI data were self-reported by study participants. Descriptive analysis was used to characterize the weight loss profile of the study respondents. A total of 225 adults participated in this study and majority of them were women (83.6%), age 30 – 39 years (50.2%), Malay (94.7%), married (60.9%) and currently employed (62.2%). The study respondents realized they have become overweight at the mean age of 25.0±8.4 years and their maximum lifetime mean weight and mean BMI were 84.6±16.3 kg and 33.3±5.5 kg/m^2. Overall, over a duration of 45.1±63.1 weeks, the study participants managed to reduce a mean weight of 13.7±10.5 kg with mean BMI change of 5.4±4.1 kg/m^2. This study also found that majority (62.2%) of the study participants had lost more than 10% from their initial weight. When asked regarding their experience during their weight loss journey, 81.1% reported that it was not an easy journey. On a positive note, after weight loss, majority of study respondents reported an improvement on physical well-being (75.2%), social interaction (72%) and psychological and emotional wellbeing (74.6%). In conclusion, significant amount of intentional weight loss could be achieved by this Malay majority study respondents over a varied duration. Although it was

reported as a challenging journey, the study respondents did experience positive changes in the areas of life. Further studies would be needed to explore the success stories and strategies of weight loss among a representative Malaysian population.

A11 The effectiveness of *Warga Emas Sihat* (WESIHAT) Programme towards quality of life of elderly at *Pusat Aktiviti Warga Emas* (PAWE) Sg Kantan, Kajang, Selangor

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Mild Cognitive Impairment (MCI) is a process of cognitive decline before dementia occur which cause difficulty among elderly to do daily activities. MCI is often associated with dementia syndrome, but this was not a feature of normal aging. A health intervention program namely WESIHAT programme, was developed by Centre for Healthy Aging and Wellness (H-CARE), UKM to address the problem. This study was conducted to assess the effectiveness of the WESIHAT programme to improve the quality of life of elderly at PAWE Sg Kantan, Kajang. This cross-sectional study consists of four phases which include; Phase I was needs assessment, Phase II was the pre-programme health screening including blood collection, anthropometric measurements; measurement of height, weight, half arm span, BMI, fat percentage, circumferences (mid upper arm, calf, waist and hip), whereas questionnaire consist of MMSE, MoCA, GDS-15, MOS-SSS,WHODAS 2.0 and knowledge of health which determined the baseline data, Phase III involved the eight-sessions health sharing and Phase IV was the WESIHAT post-program health screening. The number of subjects differ in each phase; Phase I involved 20 subjects, Phase II involved 26 subjects, and Phase IV involved 16 subjects. However, participation was opened to the public for Phase III. The results showed that the majority of subjects throughout the program were 75% female. Biochemical data showed no significant changes in the pre and post WESIHAT programme comparisons but there were positive changes in each blood test result. Furthermore, this study showed a significant difference only on enhancement of health knowledge ($p<0.05$). Therefore, WESIHAT program improved the knowledge of elderly and promotes healthy lifestyle. Improvements on methods of conducting activities during the WESIHAT program need to be done to increase the number of participants and enhance effectiveness of studies in future.

A12 Boosting immunity with proper nutrition: an update

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Proper function of the immune system is vital for health and survival. During this crucial period of COVID-19 pandemic, it is very important to boost our immune system to fight against the virus. Research findings suggest that improving our nutrition status helps the immune system to function properly to fight against any infection and protect against numerous diseases. Healthy immune cells are vital for a healthy immune system. Adequate and appropriate nutrition is required for the optimum function of the cells in the immune system. Both over and undernutrition compromises the function of immune system. Vitamins and minerals also have important roles in maintaining proper structure

and function of the immune system. Vitamin A, B, C, D, E, minerals e.g. zinc, selenium, branched chain amino acids and glutamine has been widely reported to modulate gene expression, cell differentiation, growth, activation and function of diverse immune cells and antibody response. Deficiency of the aforementioned nutrients hampers the structure and function of the immune system. Appropriate nutrition reduces or delays the onset of immune-mediated chronic diseases in healthy individuals. Nutritional modulation of the immune system has immense role in alleviating the sufferings of the sick patients. Better understanding and awareness about the role of diet and nutrients in boosting the immune function will help to reduce the onset of diseases and sufferings of the people.

A13 Correlation of macronutrient intake, physical activity, exercise habits with weight in Ketofastosis community members

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The objective of this study to find out whether there is a correlation between macronutrient intake, physical activity, exercise habits, and body weight in members of the Ketofastosis community. This research used a cross-sectional research design. The study population the Ketofastosis community with a total of 181 people. The research sample consisted of 40 people who were selected using purposive sampling. The data of this study included data on the characteristics of respondents, intake of macronutrients using the food record and food recall form, physical activity using the PAL (Physical Activity Level) questionnaire, exercise habits using the Baecke questionnaire. Body weights were measured using a weighing device. Data were analysed using the Spearman rank correlation test. All respondents had a history of 100% less carbohydrate intake, less protein intake by 50%, and a 45% excess fat intake. Most of the respondents had a history of light physical activity by 35% and active exercise of 77.5%. Respondents who had an ideal body weight of 50%, less body weight were 7.5%, and overweight was 42.5% in the normal weight category. 90-110%, underweight with a value of <90%, overweight with a value of >110% based on the calculation of ideal body weight using the Broca formula. There was a significant correlation between fat intake and body weight (p=0.028) and (r=-0.347*); the higher the fat intake, the lower the body weight in members of the Ketofastosis community.

A14 Prenatal circadian preference and its association with new-born sleep outcome: a prospective observational study

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Circadian preference toward eveningness has been associated with sleep problems during pregnancy which in turn may affect the new-born's sleep quality and development. The present study aims to identify the association between prenatal circadian preference with sleep outcome of new-born at 1-month-old. A prospective observational study was conducted at selected government maternal clinics located in Kuala Lumpur. Recruitment and administration of the first questionnaire occurred prenatally; meanwhile, follow-up questionnaires were sent to the subjects 1-month post childbirth. Data on maternal sociodemographic characteristic was collected via self-administrated questionnaire;

maternal circadian preference was measured using the 19-items Morningness- Eveningness Questionnaire (MEQ); whereas the new-born sleep outcome at 1-month-old was assessed using the Brief Infant Sleep Questionnaire-Revised Short form (BISQ-R SF). The BISQ-R SF variables of interest in this study were infant night-time bedtime, sleep latency, frequency of night waking, duration of night waking, longest period of consolidated sleep, total sleep time and parent perceived bedtime difficulty. Data of 96 mothers with a mean age of 28.6±3.9 years and their new-born (40% male and 60% female) were included. The distribution of prenatal maternal circadian preference was as following: moderate evening type (1%), intermediate (67%), moderate morning type (30%) and definite morning type (2%). Results showed that mothers with increased preference towards eveningness had babies with longer sleep latency (r=-0.212; p=0.038) and increase score of parent perceived bedtime difficulty (r=-0.234; p=0.024) at the age of 1-month-old. No correlations were found between MEQ score and other BISQ variables. These results indicated that maternal circadian preference seems to be related to early onset of sleeping difficulty among new-borns. The finding of this study may be helpful to health professionals in educating mothers in understanding their infant sleep behaviour.

A15 Nutritional status and its association with quality of life of non-government institutionalised elderly at Georgetown, Penang

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Assessment of nutritional status and its association with quality of life of non-government institutionalised elderly was conducted on 173 respondents by using a cross sectional study at five selected old folk homes at Georgetown, Penang. The respondents were recruited using a systematic random sampling method which fit the inclusion criteria. Data was collected using validated questionnaire encompassing socio-demographic characteristics, Mini Nutritional Assessment (MNA), anthropometric measurement, 24 hour dietary recall and SF-36 questionnaire with guided face-to-face interviewed by researcher. The findings were analysed using IBM SPSS statistics version 25 software. The socio-demographic data of the respondents was analysed using descriptive statistic. Descriptive statistic was also used to determine the level of quality of life and its determinants factors among institutionalised elderly at Georgetown, Penang. Pearson's chi-square test with the significance level of $p<0.05$ was applied to study the relationship between level of quality of life on elderly with selected factors (gender, marital status, number of children, health status, waist circumferences and length of stay in the institution). The findings of this study show that majority of female (37.6%) has low level of quality of life and most of the elderly are at high risk of co-morbidities based on waist circumference measurement. In this study, multiple logistic regression was applied and there is statistically significant relationship between selected factors (BMI, nutritional assessments status, and gender) with level of quality of life among elderly. By proper planning of health promotion program, might help in increasing the quality of life among elderly.

A16 Rapid assessment tool for Malaysian infants and young children feeding during an emergency: validity and usability

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Emergency or disaster is a situation where the community activities and country's affairs are disturbed. Various rapid tools have been developed internationally for assessing nutrition during an emergency, but the validity and usability of those tools in Malaysia remains unknown. The objective of this study was to develop and validate a local rapid assessment tool for infants and young children (0–24 months) feeding during emergency. This research was carried out in three phases. The first phase was the rapid assessment tool development based on international guidelines recommendations. The developed tool is divided into six sections which consist of 40 technical items. Subsequently, the developed tool underwent face and content validation with five field expert panels. In the last phase, content validation and usability testing were carried out by 13 nutrition officers from Ministry of Health, Malaysia representing seven different States. The face and content validity were indicated by Absolute Inter-rater Agreement Percentage and Content Validity Index (CVI) respectively. On the other hand, the usability was assessed using System Usability Scale (SUS). The rapid assessment tool scored high in both face validity (Absolute Inter-rater Agreement Percentage = 83.3 – 100%) and content validity (S-CVI/Ave for Relevancy = 0.94 – 1; S-CVI/Ave for Clarity = 0.94 – 0.95; S-CVI/Ave for essentiality = 0.89 – 0.97). In addition, 8 out of 13 subjects (61.5%) felt that the tool is useable at shelters during any emergency. The preliminary findings suggested that this newly developed rapid assessment tool has valid content and acceptable by the nutrition officers from Ministry of Health, Malaysia to identify infants and young children's nutrition needs during emergency. Taking into consideration that all affected population should be inclusive in disaster management, we suggest similar study to be carried out for the other age groups.

A17 Perceptions of preschool teachers in implementing The ToyBox Study Malaysia intervention

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The ToyBox Study Malaysia is an intervention developed to improve four key behaviours, namely drinking, eating and snacking, physical activity, and sedentary behaviour, to prevent obesity among preschool children. Fifteen preschools under the Community Development Department (KEMAS) in Klang Valley were selected to implement the intervention. A qualitative study was conducted to obtain teachers' and teacher assistants' perspectives and feedback in implementing the ToyBox Study Malaysia. A total of 14 teachers and 10 teacher assistants participated in three separate focus group discussion (FGD) sessions, which was conducted by a trained moderator. A standard protocol and study-specific semi-structured interview guide were employed during the FGD sessions, which were executed within an hour. The data were transcribed verbatim, coded and analysed by at least two researchers and validated by the research team. Participants were all Malay women aged 24 to 55 years old. Three main themes emerged from the focus group, which were: (1) experience in overall implementation, (2) perception on issues during implementation, and (3) impact of intervention on their practices. These findings showed that all participants agreed that materials and activities provided in Toybox were useful, well-organised and practical. Participants also observed positive changes in all four targeted behaviours in many of the children in their classes. However, there was still room for improvement, and alternative ideas were suggested for future improvements. Participants provided positive feedback that the ToyBox Study Malaysia intervention can be extended to other preschools

and that the materials are useful and can be provided as a teaching aid to other preschool teachers. With the prolonged COVID-19 pandemic, a timely strategy would be to move into the digitalisation era as part of efforts to increase reach and improve sustainability of ToyBox Study Malaysia and other future nutrition education intervention programmes.

A18 Prevalence of food insecurity and its relationship with socio-demographic characteristics, psychosocial health status and academic performance among undergraduate students in Universiti Putra Malaysia

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Food insecurity is growing concern among university students. The prevalence of food insecurity among this vulnerable group become major public health problem and eventually will negatively interfere with their psychosocial health and academic performance. This study assessed the prevalence of food insecurity and its relationship with socio-demographic characteristics, psychosocial health status and academic performance among undergraduate students in Universiti Putra Malaysia. This cross-sectional study was conducted among undergraduate students (n=663) involving seven randomly selected of faculties in Universiti Putra Malaysia. Food security status was measured using 10-item U.S Adult Food Security Survey Module meanwhile DASS-21 was used to assess psychological health. Furthermore, socio-demographic characteristics and Cumulative Grade Point Average (CGPA) was self-reported by the respondents. Of participating students, 32.4% of respondents are male. About 62.8% of respondents reported had some kind of food insecurity.Binary logistic regression revealed that students from middle (OR=9.90, 95%CI: 1.15, 85.07) and bottom (OR=11.57, 95% CI: 1.29, 104.26) household income, students who answered financial aid were not enough (OR=5.542, 95% CI: 0.93, 13.75) were more likely to experience food insecurity. In addition, students in mild/moderate group (OR=2.89, 95% CI: 1.81, 4.52) and severe/extremely severe group (OR=2.63, 95% CI: 1.50, 4.60) for anxiety were more likely to experience food insecurity. Mild/moderate depression group (OR=2.79, 95% CI: 1.78, 4.38) were 2.79 times more likely to experience food insecurity compared to normal depression group. Students with CGPA less than 3.7 showed high odds to have food insecurity (OR=2.09, 95% CI: 1.20, 3.65). In conclusion, study found that food insecurity have great significant influences toward psychosocial health of students and their academic performance. Therefore, higher education institutions should identifies the students who experienced food insecurity and conduct future intervention programs to improve food security status among students, thus yield benefits to their psychosocial health outcomes and academic performance.

A19 The feasibility training of trainers (ToT) for *warga emas sihat* (WESIHAT) programme to improve the quality of life among senior citizens

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The increasing population of senior citizens in Malaysia is in line with the increasing

prevalence of mild cognitive impairment and dementia. Therefore, WESIHAT programme was developed to help senior citizens achieving successful aging. This study aimed to evaluate the feasibility training of trainers (ToT) for Warga Emas Sihat (WESIHAT) programme to improve the quality of life among senior citizens in Bandar Baru Bangi. WESIHAT 2.0 contains four modules, namely screening tools to detect cognitive problems (OLD-WELLNESS), 10 guidelines to enhance memory, health diary and healthy menu guide. This was a cross-sectional study includes 27 individuals aged 50 years old and above who have the skills of using smartphones and the Internet. This study involved four phases starting with pre-programme screening, training workshop, 7-weeks of WESIHAT programme and post-programme screening. Subjects were required to answer questionnaires during the screenings which were cognitive test (MoCA and MMSE), geriatric depression scale test (GDS-15), disability test (WHODAS 2.0), social support survey (MOS-SSS) and knowledge on WESIHAT. In addition, anthropometric and biochemical measurements were also performed. Six senior trainers were selected for the training workshop and they were required to answer the questionnaire on perceptions of the training workshop and the feasibility of ToT among senior citizens. There was no significant improvement in the quality of life of the subjects before and after WESIHAT programme and this study reported a high drop out. The trainers reported the training workshop and the usage of manual provided by the researcher were very helpful in learning how to use WeSihat 2.0 website and in educating WeSihat 2.0 information to others. ToT programs are practicable among senior citizens, but the data of this study cannot be fully utilised due to the limited subject involvement. This study should be carried out more effectively once WeSihat 2.0 smartphone application is available.

A20 Determinants of serum 25-hydroxyvitamin D concentration in Malay workers in Kelantan

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Vitamin D is also known as the sunshine vitamin. Any factors that absorb or prevent ultraviolet B radiation will decrease cutaneous vitamin D synthesis. Very few studies have investigated the determinants of serum vitamin D levels using a set of variables that include simultaneously occupation, sun exposure, sun protection usage, dietary vitamin D intake, physical activity and anthropometry. This study aimed to identify factors modifying serum 25-hydroxyvitamin D (25(OH)D) levels among Malay workers during non-monsoon and monsoon seasons. A comparative cross sectional study was conducted among outdoor (n=119) and indoor workers (n=119) in Kelantan, Malaysia. Data was collected twice from each respondent, firstly during non-monsoon and secondly during monsoon season. Anthropometric measurements (waist circumference, body fat and BMI), fasting blood test (serum 25(OH)D level) and questionnaire (socio-demographic, sunlight exposure, sun protection use, physical activity and dietary VD intake) were conducted. Data was analyzed using two separate multiple linear regression models. Serum 25(OH)D level was significantly lower among indoor workers regardless of sex and season ($p<0.001$). In model 1, serum 25(OH)D in non-monsoon season was significantly associated with female sex, sunlight exposure and sun protection scores. In model 2, serum 25(OH)D during monsoon season was directly predicted by sunlight exposure, and inversely by female sex, sun protection scores, indoor occupation and BMI. As the adjusted R^2 of both seasons were almost similar (>70%), and BMI as well as occupation were biologically and statistically meaningful to 25(OH)D, Model 2 was a better predictor of serum 25(OH)D level. This finding shows that 71.0% of 25(OH)D were explained by occupation, sex, sunlight exposure, sun protection and BMI. In conclusion, public health policies need to address these modifiable factors in order to improve vitamin D status in the general population.

A21 Induced lactation experiences and perspectives on support among support person: A qualitative study

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A comprehensive support system is one of the essential factors in the adoptive breastfeeding process. Adoptive mothers are confronted with numerous induced lactation practice challenges both at the individual and societal levels. This study aims to explore the support of persons' perceptions and experiences towards induced lactation practice in Malaysia. A qualitative case study approach using an in-depth interview as data collection method was conducted among support persons of induced lactation women from five regions in Malaysia, i.e. [South (Johor), Central (Selangor), North (Penang), East (Kelantan) and East Malaysia (Sabah)]. The interviews consented, audio-recorded then transcribed verbatim, followed by identification of emerging themes. Data saturation was achieved after a total of 23 support persons were interviewed. Data synthesised using thematic analysis revealed that support persons' perceptions were positive and in favor towards induced lactation process. We recognised that to achieve successful adoptive breastfeeding, support persons' active engagement, and proactive involvement in meetings with health professionals and integrating treatment plans into daily schedules were essential. Family members, especially husbands, do influence the mothers of adoptive breastfeeding decisions and treatment outcome. It is vital for health care providers to acknowledge and encourage husbands or family members of adoptive breastfeeding women to engage them in learning and supporting the adoptive women.

A22 Sex differences in body composition among University students

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Measurement of body composition is gaining attention in research practice to predict the health status of individuals which are mostly related to non-communicable diseases. However, less is known about the differences in body composition between sexes, particularly among university students. The present study aimed to determine the differences in body compositions status between male and female university students. A total of 113 students from a local university in Malaysia were involved in this study. Student's height was measured by using Seca 217 stadiometer, while student's body weight, skeletal muscle mass (SKMM), body fat percentage (BF%) and waist-to-hip ratio (WtHR) were determined by using InBody 570 machine. All the measurements were handled by a trained researcher. The comparison of each variable of body compositions between sexes was analysed using independent sample t-test with the significant level was set at $p<0.05$. The present result shows the mean value of BMI, SKMM, BF% and WtHR were 21.8±4.1, 20.2±4.9, 31.7±8.2, and 0.8±0.1, respectively. Based on BMI classification, the prevalence of underweight, overweight and obesity were 22.1%, 15.9%, and 2.7%, respectively. The result of BF% and WtHR categories has shown that half of the students (50.0%) were reported over-

fat and 63.8% of them were high risk in getting diseases. Male was found significantly higher in BMI (23.9±4.0) (t=2.345, p=0.021) and SKMM (29.4±3.7) (t=14.995, p=0.0001) scores than female (BMI=21.5±4.0; SKMM=18.4±2.7). Meanwhile, female (33.5±7.0) was significantly higher in BF% as compared to male (22.1±7.5) (t=-6.286, p=0.0001). There was no significantly different was reported in WtHR between sex. To conclude, balanced diet combined with consistent physical activity should be emphasized in both sexes to ensure their body compositions status, including BMI, SKMM, BF% and WtHR are within in normal range.

A23 Physical activity and sedentary behaviour of preschool children and their relationship with parental smartphone use pattern

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This cross-sectional study was conducted to assess the physical activity (PA) and sedentary behaviour of preschool children and their relationship with parents' smartphone use pattern. A total of 60 children aged 4.3±0.2 years from 18 kindergartens located in urban and rural areas of Kuala Lumpur and Selangor participated in this study. Parents' questionnaire was used to assess smartphone use pattern, while accelerometer (Actigraph GT3X+) was used to measure physical activity and sedentary behaviour. Accelerometer was worn on the right hip, for 24 hours, from Monday to Friday. Height and weight were measured, and Z-scores of BMI-for-age and height-for-age were determined and classified using WHO AnthroPlus software. Results from this study showed that children spent most time in sedentary activities (median 1087.9 minute/day), followed by light PA (296.0 minute/day), moderate-to-vigorous PA (MVPA) (54.1 minutes/day), moderate PA (41.6 minute/day), and vigorous PA (13.3 minute/day). There was no significant difference in level of physical activity between the sexes (p>0.05). Only 43.3% of children achieved PA recommendation of at least 60 minutes or more of MVPA per day. The majority of parents/guardians (>50%) never or rarely (less than once a week) use their smartphones while with their children during meals, playtime, travel or walks. Half of the parents/guardians (53.3%) reported that they never used a smartphone during bedtime routine. There were no significant correlation between the frequency of parents'/guardian's smartphone use and the children's PA time (all p>0.05). These findings suggest that parental smartphone use has no significant relationship with the amount of time preschool children spent in light, moderate or vigorous PA.

A24 Knowledge, attitude and practice on nutrition and family planning and its association with body weight status among undergraduate students in Universiti Putra Malaysia

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Overweight and obesity has always been a challenging issue among young adults with reproductive age in university as overweight and obesity position them in numerous multiple

chronic diseases and complications. There were several factors that were found to contribute to body weight status among young adults. However, contradicting findings were observed in the local context. Hence, the cross-sectional study aimed to determine the association between socio-demographic factors, knowledge, attitude and practice (KAP) of nutrition and family planning and weight status of undergraduate students in Universiti Putra Malaysia (UPM). A set of pre-tested, self-administered questionnaire that assess the socio-demographic background, KAP of nutrition and family planning as well as anthropometry measurement was used to collect relevant information from students in UPM. A total of 141 students that was dominant by female (75.9%) with mean age of 21.64±1.41 years old, from three selected faculties in UPM were recruited to take part in this study. Majority of them are Malay, second year student with the median of monthly allowance of RM400. A total of 56.7% of the respondents have normal Body Mass Index (BMI), 22.7% were underweight and 15.6% and 5.0% were overweight and obese respectively. Majority of the students had adequate knowledge (74.4%), positive attitude (95.7%) and good practice (67.3%) towards nutrition. However, regarding the KAP of family planning, generally respondents from this study had poor to moderate knowledge towards family planning and approximately 97 out of 141 respondents have moderately positive attitude towards family planning. A positive association of age ($r=0.189$, $p<0.05$) with BMI were found. Findings from this study found that the prevalence of overweight and obesity among the respondents is still there among the students despite their acceptable KAP score in nutrition.

A25 Factors correlated with fat-to-muscle ratio (FMR) among primary school children in Selangor and Negeri Sembilan

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Fat-to-muscle ratio (FMR) is defined as ratio of fat mass to muscle mass, which is part of body composition. A higher FMR of an individual is associated with higher rates of overweight and obesity as well as risks of non-communicable diseases. This cross-sectional study aimed to determine the correlations of socio-demographic characteristics, eating behaviors, physical activity with FMR among primary school children in Selangor and Negeri Sembilan. A total of 410 primary school children (72.4% boys and 27.6% girls), with a mean age of 9.67±1.51 years, were recruited from 11 urban-poor communities in Selangor and Negeri Sembilan. Fat mass and skeletal muscle mass were measured by using Bioelectrical Impedance Analysis (BIA; InBody 270). A set of self-administered questionnaire that assessed socio-demographic characteristics, eating behaviors, and physical activity were completed by the children. Results showed that the mean of FMR among the primary school children was 0.62 ± 0.50, whereby there was no significant different in FMR between boys and girls ($t=-1.158$, $p=0.248$). Results from the Pearson correlation test showed that there was no significant correlation between age and FMR ($r=-0.031$, $p=0.530$). In term of eating behaviors, consumption of main meals, snacking behaviors and fast food consumption were not significant correlated with FMR. Meanwhile, physical activity was negatively correlated with FMR ($r=-0.136$, $p=0.006$). In other words, the more physically active in children, the more lesser fat and higher muscle (lower FMR). In conclusion, physical activity plays an important role in increasing muscle mass and reducing fat mass among school children. Children should be educated on the importance of physical activity and they should be given opportunities to practice physical activities in promoting healthy body composition among school-aged children.

A26 The development, validity and reliability of knowledge, attitude and practice (KAP) questionnaire towards "Frailty Intervention through Nutrition Education and Exercise (FINE)" programme

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The objectives of the study are to develop and to determine the validity and the reliability of the knowledge, attitude and practice (KAP) questionnaire towards the "FINE" programme. The "FINE" programme is a 3-month frailty intervention program that aim to improve the frailty status among pre-frail Malaysian elderly in Programme Perumahan Rakyat (PPR) flats in Kuala Lumpur area. The frailty intervention programme includes both nutrition education and exercise intervention. In order to assess the improvement of the intervention programme, one of the variables that was included is the changes of score of the KAP questionnaire throughout the programme. Thus, a KAP questionnaire is developed based on the intervention program and was tested for its validation and reliability. The developed KAP questionnaire consist of 11 items for knowledge, 10 items for attitude and 10 items for practice, mainly comprises of the questions regarding frailty, healthy eating and physical activity. Content and face validity were determined by 3 experts and 20 elderlies respectively. For reliability study, a total of 82 Malaysian elderlies aged 60 years and above from 5 different location of PPR flats were interviewed and the data were analysed statistically to determine its internal consistency reliability. The participants consist of 24 males and 58 females which were from different races; 62% Malay, 12% Chinese and 26% Indian. The mean age of the participant is 68.061 (SD=5.690). Based on the data collected, the KAP questionnaire was reliable based on its internal consistency reliability (knowledge: α=0.853; attitude: α=0.720; practice: α=0.600). Evidence of the validity and reliability of the KAP questionnaire towards the "FINE" programme has been obtained (11 knowledge, 10 attitude and 6 practice items) and can be used to assess the KAP on the "FINE" programme among Malaysian elderlies.

A27 Factors associated with fad diets among undergraduate students in Universiti Putra Malaysia

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Fad diets are any diet plan in defiance of logic, basic biochemistry and appetite, which impact the nutritional and health status of those who are practicing fad diets (food faddists). Fad diets are characterised by any allegations made that are unrealistic and not supported by scientifically valid evidence. Besides, fad diets promote the elimination and restriction of certain food groups. Fad diets can lead to micronutrient deficiency and disrupt vital metabolic reactions. This cross-sectional study was designed to determine factors associated with fad diets among 188 undergraduate students in Universiti Putra Malaysia (UPM). Respondents in this study were selected using a simple random sampling method. Respondents completed a self-administered questionnaire on socio-demographic background, body image perception, self-esteem, sources of information on nutrition

and health, nutrition knowledge, and fad diet practices was assessed using an adapted questionnaire from Rafiqa *et al.* (2014) and fad diets' characteristics from British Dietetic Association (2017). A Median Split method was used to classify food faddist (upper median) and non-food faddist (lower median). Anthropometric measurements, including weight, height, and waist circumference were conducted. Results showed that most of the respondents dissatisfied with their body image (76.1%), had low self-esteem (62.8%), used online resources (78.2%) to obtain nutrition and health information, and had good nutrition knowledge (83.5%). The prevalence of practicing fad diets was 45.2%. Living in a college dormitory, friends/peers (verbally), seeking nutrition and health information from healthcare professionals such as nutritionists and dietitians, and body mass index of overweight/obese respondents were associated with fad diets practices (p<0.05). In conclusion, these findings suggest a pressing need for nutritionists to demystify regarding health and nutrition information on social media. Health promotion programs should be incorporated into university health activities for undergraduate students to prevent the development and worsening of body image dissatisfaction and low self-esteem level.

A28 Prevalence of overweight and obesity among public university students in Peninsular Malaysia

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Obesity has become the most critical menace to human health and a severe global public health problem. Obesity is associated with an elevated risk of several major non-communicable diseases, including type 2 diabetes, coronary heart disease, stroke, asthma, and several cancers. Thus, this cross-sectional study aims to determine the prevalence and factors associated with overweight and obesity among university students attending public universities in Peninsular Malaysia. Multistage random sampling was used to select respondents from public universities in Peninsular Malaysia. A total of 427 undergraduate students completed a self-administered questionnaire at four randomly selected universities (Universiti Utara Malaysia, Universiti Kebangsaan Malaysia, Universiti Malaysia Pahang, and Universiti Teknologi Malaysia). The questionnaire consists of information concerning the demographic and socioeconomic background, physical activity level, financial literacy, financial problem, food security status, and anthropometric measurement (height, weight) among university students. Frequency, chi-square, and logistic regression were used to analyse the variables. The mean age of the respondents was 21.6 years, with an average BMI of 23.4±5.03 kg/$m^{2,}$ and 31.6% were overweight and obese. The prevalence of underweight, normal weight, overweight, and obesity was 12.7%, 55.7%, 21.1%, and 10.5%, respectively. This study found that students originated from rural area (x^2=8.061) was significantly associated with overweight and obesity (p<0.05). Students originated from rural areas (AOR=1.918, 95% CI: 1.201-3.062) were 1.9 times more likely to be overweight and obese. Levels of overweight and obesity are increasing faster in rural areas since rural areas have begun to resemble urban areas as the modern food supply is now available. One over three university students were overweight and obese. The prevalence of overweight and obesity is higher among university students. Thus, there is a need for a coordinated approach that improves financial and physical access to healthy foods among rural communities, shunning excessive consumption of low-quality calories.

A29 Association between health literacy, sociodemographic and socioeconomic factors with body mass index (BMI) among secondary school student in Kota Bharu, Kelantan

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Since rapid economic growth, lifestyles and disease trends in Malaysia have shifted. The alarming prevalence of underweight, overweight and obesity among adolescents has become a major public health concern. The burden of the disease and mortality rate had been reported to be related to overweight and obesity. Early identification of body mass index (BMI) status can help minimise associated comorbidities. This cross-sectional study aims to examine the association BMI and health literacy among secondary school students in Kota Bharu, Kelantan. The association of sociodemographic and socioeconomic factors with BMI was also identified. A total of 103 students aged 14 and 16 years old were recruited using a simple random sampling (44 males, 59 females). Health literacy was assessed using the Newest Vital Sign (NVS) questionnaire Malay version. The weight and height of the students were measured by trained researchers to determine their BMI. Information was obtained from a self-reported questionnaire on age, gender, parents' education level and household income. The mean BMI of the female students was significantly greater than male students ($p<0.05$). In conclusion, even though the prevalence of obesity is low but the overall of underweight prevalence among school-age adolescents is high. There is an urgent need for a comprehensive integrated population-based intervention program to alleviate the increasing prevalence of adolescent malnutrition. The promotion and awareness program on healthy eating and physical activities is needed to resolve the problems of under-and over-nutrition co-exist in order to create a strong and healthy nation in the future.

A30 Nutritional status among different types of vegetarians residing in Klang Valley areas

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Due to the health benefits of adopting vegetarianism, there is a rising trend in the number of vegetarians in Malaysia. This cross-sectional study aims to assess the nutritional status of vegetarians residing in Klang Valley areas. Besides collecting information on socio-demographic background and lifestyle habits using questionnaire-based interviews, dietary intake of vegetarians were recorded using electronic food diaries (IMBAS™), while body weight, height and blood pressure were measured during home visits. A total of 158 vegetarians (49 males, 109 females) aged 19-60 years, consisting of 107 lacto-ovo vegetarians, 36 vegans, 8 lacto-vegetarians and 7 ovo-vegetarians participated in this study. Median Body Mass Index (BMI) and blood pressure for subjects were 22.3 kg/m^2 and 115/69 mmHg respectively. Majority of participants had normal weight status (65.8%) and optimal blood pressure (60.1%). Among 70 (44.3%) subjects who completed their three-day diet records, only 36 (51%) subjects were plausible energy reporters. The average energy intake were 1433kcal, 932kcal, 1314kcal and 893kcal among vegans, lacto-vegetarians, lacto-ovo vegetarians and ovo-vegetarians, respectively ($p=0.391$). Lacto-ovo vegetarians had the highest protein (median intake 43.9g, IQR 34.4-52.3) and fat (44.3g, IQR 36.0-58.6) intake compared to other vegetarians ($p<0.001$). The intake of potassium (15.7% RNI), niacin (29.1% RNI), calcium (31.9% RNI) and dietary fibre (47.0% RNI) were much

lower than the Recommended Nutrient Intakes (RNI). However, no significant difference was detected for the energy, carbohydrate and micronutrients intake among different types of vegetarians. Overall, there was no significant difference between different types of vegetarians in terms of nutritional status. Future studies should recruit larger number of subjects to enable more conclusive comparison on nutritional status of different types of vegetarians in Malaysia.

A31 Nutrition education intervention using internet-based website and daily reminder via personal and group WhatsApp chats on young adult females with self-perceived negative body image

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Young adult females with self-perceived negative body image are increasing and this is alarming as body dissatisfaction can lead to unhealthy eating habits and poor nutritional status. Suitable intervention is needed to address this issue. This study aimed to investigate the effectiveness of nutrition education intervention program using internet-based website and daily reminder via personal and group WhatsApp chats to overcome negative body image perceptions. Study participants comprised of 94 young adult females with mean age of 21.1±1.4 years, screened and identified as having negative body image perception. Outcome measures included study participants' scores on the Stunkard figure rating scale, Body Acceptance Scale and Body Appreciation Scale at baseline and post-intervention. Main study findings indicated that body acceptance and body appreciation of participants significantly improved after the intervention but there was no significant change in body image satisfaction. The number of participants categorised as having high body acceptance was 11.7% higher post-intervention. Participants showed marked trend in answering "4 (often)" and "5 (always)" for questions on the Body Appreciation scale post-intervention indicating increase in body appreciation. Daily reminders via WhatsApp personal chat gained the most favourable response from participants. In conclusion, this technology-aided intervention method was useful in improving body acceptance and body appreciation in young adult females with self-perceived negative body image perception in this intervention.

A32 Nutritional status among pregnant teenagers in Klang Valley

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Nutritional status of pregnant teenagers is important to ensure the health and pregnancy outcome for both mother and baby. The objective of this study was to assess the nutritional status among 25 pregnant teenagers, aged 14-19 years old in Klang Valley. The pregnant teenagers were recruited from Taman Seri Puteri Cheras (under JKM) and Raudhatus Sakinah (NGO). Sociodemographic data, anthropometric measurement, haemoglobin status, 2-days 24-hour diet recall method (weekday and weekend) and birth outcomes were collected and analysed. 60% of subjects were 16 to 19 year olds. Majority of the parents (88%) were in B40 socioeconomic status earning RM3860 and below. Although 60% of subjects had normal pre-pregnancy BMI, 52% did not achieve IOM recommended weight

gain. Majority of subjects did not meet the recommendation for energy intake and many nutrients through dietary intake alone. The energy intake in the first, second and third trimester of pregnancy only achieved 51.8%, 72.3% and 66.7% respectively of the RNI. Nutrients of concern such as calcium (34.5% RNI), vitamin D (8.7% RNI), vitamin E (45.3% RNI) and niacin (45.2% RNI) also did not fulfil the recommendation for teenage pregnancy. For haemoglobin status, 52% of subjects were anaemic with haemoglobin levels below 11 g/dL. Out of 25 subjects, 20 subjects had a safe birth, however with 25% delivering their babies prematurely (less than 37 weeks) and 20% of the babies had low birth weight. This small study showed the nutritional status of pregnant teenagers was unsatisfactory with inadequate energy and micronutrients intakes and poor weight gain during pregnancy. Hence, this resulted in an unacceptable birth outcome such as premature birth and low birth weight babies. A nationwide nutritional status of pregnant teenager studies is warranted to ascertain the extent of nutritional problems in this community. In the meantime, more nutrition education programmes need to be carried out among teenage pregnant mothers to assure better nutritional status and birth outcomes.

A33 Changes of stunting among children below five years old in Malaysia from 2015 and 2019

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Stunting (low height-for-age) reflects failure of the growing child to receive adequate nutrition over a long period. This study aimed to determine the changes in the prevalence of stunting among children below five years between 2015 and 2019. The changes in the prevalence of stunting among children age five years and below was evaluated by sociodemographic characteristics. This study utilised the data from the National Health and Morbidity Survey (NHMS) 2015 and 2019, both nationwide cross-sectional surveys, representative of the Malaysian population. All anthropometry measurements were taken by trained personnel using standardized equipment and protocol. Stunting was classified based on the WHO Growth Standard 2006; height-for-age of <-2SD. The prevalence of stunting among children age five years and below increased from 17.7% (95% CI: 15.7, 19.8) in 2015 to 21.8% (95% CI: 18.4, 25.6) in 2019. By locality, stunting remained higher in the rural areas, 20.0% (95% CI: 17.1, 23.2) in 2015 and 22.2% (95% CI: 18.7, 26.1) in 2019. By sex, boys [17.8% (95% CI: 15.3, 30.5)] had a slightly higher prevalence compared to girls [17.6% (95% CI: 14.9, 20.7)] in 2015, while 2019 showed a higher prevalence of stunting in girls [23.5% (95% CI: 18.9, 28.8)] compared to boys. Our findings indicate that there is a need for strengthening of the multi-pronged strategies to address stunting among children below five years old, by consolidating the management of malnutrition, more aggressive nutrition advocacy and health promotions.

A34 Association of physical activity and stress level with weight status of secondary school teachers in Shah Alam, Malaysia

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The incidence of non-communicable diseases is becoming more prevalent in Malaysia. Unhealthy weight status such as overweight and obesity are the major contributors to the occurrence of these diseases. This cross-sectional study was conducted in four different secondary schools using stratified sampling method to assess physical activity, stress level, and weight status of the teachers. Each respondent was required to complete a self-administered questionnaire on their socio-demographic characteristics. Physical activity level was calculated using Short-Form International Physical Activity Questionnaire (SF-IPAQ) and stress level was calculated using Perceived Stress Scale10 (PSS-10). In addition, anthropometric measurements, including height, weight, BMI, and body fat percentage of the respondents were measured. A total 110 (N=110) respondents with mean age of 40.74±9.28 years participated in this study. Overall, 22.7% and 49.1% of the teachers were overweight and obese, while 25.5% and 2.7% were having normal weight and underweight, respectively. Majority of the teachers were having moderate physical activity (68.2%) and stress level (44.5%). Results showed significant positive correlation between stress level and BMI of the teachers ($r=0.243$, $p<0.05$). There was significant negative correlation between physical activity and BMI of the teachers ($r=-0.382$, $p<0.05$). In conclusion, interventions focusing on teachers psychological and physiological factors could be done to overcome health problems associated with unhealthy weight status.

A35 Chronotype, nutritional status and blood pressure level of undergraduate students

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Chronotype plays an important role in maintaining an individual's health. It refers to which time of the day an individual prefers to rest and perform activities. Individuals are categorised as a morning, intermediate or evening person. This cross-sectional study examined differences in sociodemographic background, nutritional status and blood pressure level between different chronotypes among undergraduate students. A total of 226 students (75.7% females and 24.3% males) from three randomly selected programmes in Universiti Putra Malaysia participated in this study. They completed a self-administered questionnaire (sociodemographic characteristics, chronotype and meal patterns) and a two-day 24-hour diet recall. Anthropometry measurements and blood pressure level were measured. Results showed that 78.3% of the students were intermediate-types, 15.9% were morning-types and 5.8% were evening-types. The prevalence of overweight and obesity was 19.0% and 12.4%, respectively. About 40.4% of them had high body fat percentage and 18.8% had abdominal obesity. One fifth (21.1%) were classified as hypertension. Majority of the respondents had poor dietary intake and skipped main meals. Morning-types showed significantly higher zinc intake ($p=0.013$), diastolic blood pressure ($p=0.001$), systolic blood pressure ($p=0.031$), lower prevalence of breakfast skipping ($p=0.001$) than intermediate- and evening-types. Intermediate-types consumed breakfast and lunch earlier during weekday than during weekend, while morning-types consumed dinner earlier during weekday than during weekend. In conclusion, chronotype may be one of the factors that contributes to the nutritional status and blood pressure level of an individual. Thus, health promotion programs should highlight the importance of healthy eating behaviors by taking their chronotypes into consideration.

A36 Prevalence of gestational weight gain: findings from maternal and infants cohort study (MICOS)

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This study aimed to determine the prevalence of gestational weight gain and its association with socio-demographic and obstetrical factors. A total of 390 of pregnant mothers who were recruited in Mother and Infants Cohort Study (MICOS) were enrolled in the present study. At the third trimester of pregnancy, the pregnant women were interviewed about their socio-demographic information. Information on maternal obstetrical factors such as maternal pre-pregnancy weight, gestational weight gain (GWG), height and parity were obtained from their medical record book. A majority (91.4%) of the mothers were Malays, with a mean age of 29.95±4.21 years. Besides, most of them (81.8%) attended at least secondary education as their highest level of education and there were 40.1% of the mothers were housewives. The proportion of nulliparae, primiparae and multiparae were 40.8%, 27.7% and 31.5%, respectively. About one-third (36.3%) of the pregnant women were overweight and obese before pregnancy, with a mean pre-pregnancy body mass index (BMI) of $23.99\pm4.66 kgm^{-2}$. There were more pregnant women who had gained insufficient weight than those who had gained excessive weight during pregnancy (32.5% vs. 28.4%), with a mean GWG of 12.13±5.08kg. Bivariate analyses showed that age (F=3.23, p=0.007), parity (χ^2=14.31, p=0.006) and pre-pregnancy BMI (χ^2=30.76, p=0.0001) were significantly associated with GWG. Based on the multinomial logistic model indicates that women who were nulliparous (OR = 2.17, 95% CI = 1.16 – 4.03) and with normal/overweight pre-pregnancy BMI (OR=2.30, 95% CI=0.06 – 0.70) two times more likely to have excessive GWG rate as compared to women who were multiparous and overweight/obese respectively. All in all, more than half of the pregnant women gained inadequate or excessive weight during pregnancy and this study found that unhealthy pre-pregnancy BMI and nulli-parity is significantly risk factors for GWG.

A37 Assessment of nutritional status, dietary intake, level of physical activity and quality of life among housewives in Rawang, Gombak

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This study was conducted to assess the nutritional status, dietary intake, level of physical activity and quality of life, and specifically to identify factors associated with quality of life. This study was carried out among 217 housewives in Rawang, Gombak. Data was collected using a questionnaire comprised of sociodemographic data, International Physical Activity Questionnaire (IPAQ), 36-Item Short Form Survey (SF-36) and 24-Hours Dietary Recall. Anthropometric measurements were obtained by using standardised methods and body mass index (BMI) was calculated. This study has found that 34.6% of the study population was overweight and obese while 29.0% were at risk of co-morbidities. Out of the studied respondents, 79.7% were identified to have higher calorie intake with the mean calorie intake

of 2461.46±682.30, which was beyond the recommended range by Recommended Nutrient Intake (RNI) 2017 reference. The assessed dietary intake also shown a high prevalence of low carbohydrate intake (63.6%) and high fat intake (53.0%) among respondents. Other than that, 68.0% were reported to engage in high level of physical activity and 57.0% reported of good quality of life with the highest mean score in role emotional domain while the lowest mean score was general health domain of SF-36. This study has proved a significant association between having a good health status with high QoL (p=0.013). Hence, the housewives should practice on healthy lifestyle to combat health consequences in order to improve their quality of life.

A38 Awareness of stevia as a sugar substitute among UiTM Shah Alam students

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The purpose of this study was to determine the awareness level of stevia as a sugar substitute among students in UiTM (Universiti Teknologi MARA) Shah Alam and their willingness to change to stevia-based product. A total of 410 students from 18 faculties were involved in this study, they were full-time students, aged range from 18-35 years old. An online questionnaire was used to collect the data, consisted of 4 sections with 21 questions, mainly focused on respondents' awareness towards sugar products and substitutes, awareness towards stevia-based products and willingness to change to stevia-based products. It was hypothesized that respondents with high awareness level of stevia would be willing to change to stevia-based products. Results found 55.9% respondents were having good level of awareness of taking sugar in their daily diet with mean score of 48.84, while 44.1% of respondents did not aware of taking sugar in their diet (42.80±1.71). Regarding stevia as a sugar substitute, 54.6% of respondents were having good awareness level of stevia as a sugar substitute with mean score of 48.80±3.55, while 45.4% of respondents were not aware of stevia as a sugar substitute (37.80±4.38). The association between the respondent's awareness level and willingness to change to stevia-based product showed a weak and insignificant correlation (r=-0.029, p=0.564). This indicates that respondents with a lower awareness of stevia as sugar substitutes may be more willing to change to stevia-based product, the real-world practice may prove otherwise. In conclusion, there was a good and positive level of awareness towards stevia as a sugar substitutes among the respondents but the willingness to change to the stevia-based product was not significant.

A39 Dietary nitrate intervention and effects towards c-reactive protein (CRP) level and cognitive function among middle-aged and older Malaysian adults in Segamat, Johor

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The objective of this on-going study is to determine the correlation between dietary nitrate level with cognitive function and CRP level. This is a 24-week dietary intervention including 2 parallel arms: (1) control and (2) high-nitrate vegetable consumption. This study involved the modification of dietary habits for a period of 6 months by increased in consumption of nitrate-rich green-leafy vegetables. The reinforcement had been done via phone call due to COVID-19. This study was conducted among 60 middle-aged and older Malaysian

adults. The study population randomly selected by the application of the inclusion and exclusion criteria to the South East Asia Community Observatory (SEACO) health surveillance database. Eligible participant were invited to health facilities. Anthropometric and blood pressure measurements as well as biochemical measurement (blood and urine) had been taken from the respondent. For the dietary nitrate consumption, it had been assessed by using Food Frequency Questionnaire (FFQ) and 1-day 24-hour dietary recall. Plasma nitrate as well in urine will be determined by using chemiluminescence and Griess method. CRP level in plasma will be determined by using ELISA technique. Mini Mental State Examination (MMSE), Montreal Cognitive Assessment (MoCA), animal naming test (ANT) and Trail Making Test (TMT) were used to assess cognitive performance. Dietary nitrate of the respondents were analysed by using Nutritionist Pro software (Version 7.5.0). All statistical analyses will be performed by using Statistical Package for Social Sciences (SPSS) for Windows version 20.0.

A40 Serum ferritin thresholds for determination of iron status among pregnant women in Selangor and Kuala Lumpur, Malaysia

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Due to variation in serum ferritin (SF) thresholds used, challenges in interpretation and comparison of findings across studies preclude improved understanding of iron status during pregnancy. Thus, this study aimed to determine the prevalence of anaemia, iron deficiency (ID), iron deficiency anaemia (IDA) and iron-deficient erythropoiesis (IDE) using different SF thresholds, as well as to determine the associations between haemoglobin (Hb) and SF using respective thresholds. This study was part of Mother and Infant Cohort Study (MICOS). A total of 415 third trimester pregnant women aged 18 to 40 years, attending selected health clinics in Selangor and Kuala Lumpur, Malaysia were involved. Venous blood samples were collected for assessment of SF using ADVIA Centaur analyser. Data on assessment of Hb was extracted from antenatal medical records. Anaemia was defined as having Hb<11g/dL, whilst iron deficiency was defined as having SF<12, 15 or 30g/L, respectively. IDA was defined as having anaemia and iron deficiency, whilst IDE was defined as having iron deficiency without anaemia. This study found that the prevalence of anaemia was 40.7%, with the mean Hb of 11.171.05g/dL. The median SF was 26.70 (14.15, 45.60)g/L. Using SF thresholds of 12, 15 and 30g/L, the prevalence of ID was 19.6%, 26.4% and 55.0%, respectively; the prevalence of IDA was 12.8%, 15.3% and 25.0%, respectively; the prevalence of IDE was 6.3%, 10.8% and 29.3%, respectively. Significant associations between Hb and SF were found when SF thresholds of 12 and 15g/L were used, respectively (OR=3.609, 95% CI=2.125-6.129, p<0.001; OR=2.506, 95% CI=1.587-3.956, p<0.001). There was no significant association between Hb and SF when using SF threshold of 30g/L (OR=1.445, 95% CI=0.968-2.159, p=0.072). Health problems related to iron status, particularly anaemia during pregnancy remain high. Findings of this study suggested that SF thresholds of 12 and 15g/L are optimal to determine iron status during pregnancy.

A41 Association between chronotype and chrononutrition profile with weight status among adults

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Evening chronotype and chrononutrition profile have been shown to play a role in adult's weight status. An online cross-sectional study was conducted to: i) determine the association between chronotype with chrononutrition profile; ii) determine the association between chronotype and chrononutrition with weight status among adults aged 18-59 in Malaysia. Chronotype and chrononutrition profile were assessed using Morningness-Eveningness Questionnaire (MEQ) and Chrononutrition Profile Questionnaire (CNP-Q), respectively. Weight and height were self-reported. A total of 222 adults (73% female) with mean age 24.3±6.3 years participated. Most of them (66.2%) have an intermediate chronotype, followed by moderately evening (24.3%), moderate morning (8.1%) and definitely evening (1.4%). Results show that body mass index (BMI) correlates negatively with weekend sleep duration ($r=-0.170$, $p=0.011$). There is no significant BMI difference among chronotype groups. Subjects towards morning chronotype woke up earlier and had an earlier first eating event as well as last eating event on both workdays and weekends ($p<0.0001$). Subjects towards morning chronotype slept longer time on workdays ($r=0.167$, $p=0.013$) but shorter time on weekends ($r=-0.190$, $p=0.005$). Higher morningness was associated with shorter gap between last meal and sleep onset ($r=-0.206$, $p=0.002$) and a longer eating window ($r=0.297$, $p<0.0001$) on weekends. Subjects who consumed breakfast as the largest meal have higher morningess ($p<0.0001$). These results indicate chronotype towards morningness is related to earlier meal timing. Further research is required to investigate the association between chronotype with weight status. Such findings may be useful for health professionals to educate the public that their sleep/wake cycle and meal timing could be considerations of weight management.

A42 Postgraduate students' experience in accessing healthy eating information on social media

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Social media can potentially convey healthy eating information to the community. This study aims to explore and describe the experience of postgraduate students in accessing healthy eating information through social media. A qualitative approach was employed in this multiple case study on campus Universiti Putra Malaysia, Serdang. Purposive sampling with inclusion criteria of current Malaysian postgraduate students and snowball sampling is adopted to recruit the participants until saturation of finding is achieved. The data were collected between December 2019 to January 2020 using face-to-face semi-structured in-depth interview, transcribed verbatim, and thematic analysis is performed using Atlas.ti 8 software. Interview questions were piloted with one informant who was not included in this study result. A total of five postgraduate students with a mean age of 36 years were interviewed. Three emerging themes from the analysis are (1) beliefs, values and norms, (2) time, capacity and capability and (3) trustworthiness of information sources. The majority prefer reliable information sources that are closely related to their values and prefer reliable information sources such as from the Ministry of Health or scientific-based evidence rather than influencers. In conclusion, it is crucial to establish healthy

eating education strategies via social media that emphasis on personal values related to time-saving, enhance individual capacity and capability to prepare healthy meals. By understanding their beliefs, values and norms that influence the understanding of healthy eating, social media can be used as a platform to help promote healthy eating and improve well-being. Future study on different target group among Malaysian is recommended to have a bigger picture of different insights.

A43 Association between pre-bedtime screen media activities with sleep quality among pregnant women

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Optimal sleep during pregnancy is essential to reduce pregnancy complications. Despite the common use of screen media in modern society, little is known about its role in sleep quality during pregnancy. This study aimed to determine the pre-bedtime screen activities with sleep quality among pregnant women. A cross-sectional study was conducted in nine government antenatal clinics in Kuala Lumpur, Malaysia. In total, 240 pregnant women aged 19-40 years completed questionnaires on sociodemographic, screen media usage and sleep quality. Prevalence of poor sleep quality was 48% with mean Pittsburgh Sleep Quality Index (PSQI) global scores of 5.72±3.36. Overall, the mean sleep duration was 6 hours and 16 minutes±1 hour and 40 minutes. Sleep duration did not differ significantly across different trimesters. About 82% of pregnant women engaged in various pre-bedtime screen activities. Group who used screen media pre-bedtime had significantly longer sleep latency (p=0.007), more sleep disturbances (p=0.044), greater daytime dysfunction (p=0.02) and poorer sleep quality (p=0.045). Engagement in active screen activities before bedtime, particularly social media usage (OR=2.08, 95% CI: 1.64 -3.73; p=0.013), text messaging (OR=1.72, 95% CI: 1.01-2.92; p=0.045) and working using electronic gadgets (OR=1.92, 95% CI: 1.04–3.51; p=0.037) increased the risk of poor sleep quality among pregnant women. Decreasing active screen use during antenatal period may confer health benefits associated with good sleep. Future longitudinal studies are warranted to further explore pre-bedtime active screen time during pregnancy to provide evidence-based recommendation on good sleep hygiene.

A44 Association of energy intake and obesity in mothers and their children from selected primary schools

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Malaysia has the highest prevalence of obesity among South-East Asia countries and is still emerging as a national health issue. Excessive calories consumption contributes to the prevalence of obesity. Studies reported that mothers eating habits and food choices affected the BMI (Body Mass Index) and correlated with their children eating patterns, energy intake, and eventually their BMI. We explored the connexion between the BMI and energy consumption of mothers, followed by establishing a potential association for

the BMI of their school-aged children. This study was conducted in 20 selected primary schools located within 50 km away from the Malaysian Palm Oil Board, Bangi. Healthy and non-pregnant women (30-60 years old) and children age 10 to 11 years old (n=357) have been recruited. The body weight and height of mothers and children were measured using TANITA body analyzer and SECA stadiometer. Approximate dietary intakes were recorded using Food Frequency Questionnaire (FFQ) and analysed using NutriPro®. The BMI was calculated and categorised according to the World Health Organization (WHO) criteria for children and adults. Approximately 68% of these participants were Malay, followed by Chinese, Indian, and other ethnic groups. The estimated average energy intake of the mothers was 1787 kcal. One-fifth of the mothers were obese (BMI ≥30kg/m^2), and 19.9% of the children were obese (BMI-for-age >2 *z*-score). Mothers with higher BMI were significantly ($r=0.68$; $p<0.05$) correlated with excessive energy intake. There was also a significant association between mothers and their children's BMI ($p<0.05$). These results suggested that obese mothers are more likely to have a higher intake of food and affect their BMI; these eating habits also affect their respective children BMI.

A45 Neighborhood environment and physical activity level of UCSI University students

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Overweight and obesity are growing health problems both globally and in Malaysia due to unhealthy changes in energy-related behaviours such as decreased physical activity (PA), increased sedentary behaviour and unhealthy eating habits. The main purpose of this study was to determine the association between neighbourhood environment, barriers to being active, physical activity and weight status. This was a cross-sectional study conducted among UCSI University students. A total of 367 students completed questionnaires on socio-demographic details, NEWS Scale questionnaire, barriers to being active questionnaire and IPAQ. Weight and height measurements were taken. IBM SPSS Statistics software was used to conduct data analysis. Out of 367 respondents, 55.9% (n=205) were female and 44.1% (n=162) were male. On average students were overweight (27.27±97.01). Average Mets score was (2524.5±3562.0) and majority had moderate physical activity level (42.8%). Male students had a significantly higher physical activity intensity compared to female ($H=-3.772$, $p<0.001$). Students from a better type of residence significantly engaged with high level of PA ($F=3.27$, $p=0.039$) while students with low physical activity significantly had higher mean for lack of time as barrier of being active ($F=11.021$, $p=0.937$). In conclusion high barriers to being active and high intensity of physical activity have an important impact on the weight status and significantly associated with obesity. Therefore, further studies and interventions are needed in order to increase physical activity level and reduce perceived barriers to PA among young adults in order to reduce obesity.

Group B: Dietary Intake, Consumption Pattern & Disease

B01 Major food sources of calories and macronutrients: quantitative data from Malaysian Adolescents Nutrition Survey (ANS 2017)

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The objective of this study was to identify major food sources of calories and macronutrients among the Malaysian adolescents. It was a cross-sectional study with a sample of 1,374 adolescents aged 13 to 17 years from the Adolescents Nutrition Survey (ANS 2017). In this survey, a three-stage stratified cluster sampling design with proportionate allocation was adopted. A single 24-hour diet recalls were used. Energy and macronutrient intake for food sources were calculated based on the Malaysia Food Composition Database. The percentage of macronutrient intake for each food group was derived using the Block equations. Quantitative information regarding the specific food to the following nutrients: calories, carbohydrate, protein, and fat were calculated. The percentage of total nutrient intake that each food provided was presented for each nutrient's top 10 contributors. Rice was the top contributor for energy (13.3%) and carbohydrate (23.9%). Chicken was the main contributor for protein (26.9%) and fat (22.4%). These data may provide a basis for the selection of foods to be included in dietary assessments and quantitative food frequency questionnaires for epidemiological studies in Malaysia.

B02 Major food sources of micronutrients: quantitative data from Malaysian Adolescents Nutrition Survey (ANS 2017)

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The aim of this study was to identify the main food sources of micronutrients for adolescents in Malaysia. The study was based on a cross-sectional sample of 1,374 adolescents aged 13 to 17 years old from the Adolescents Nutrition Survey (ANS 2017). Intake of micronutrients and food sources were determined using a single 24-hour diet recall based on the Malaysian Food Composition Database. A three-stage stratified cluster sampling design with proportionate allocation was adopted in this survey. Using the Block equations, the percentage of micronutrient consumption for each food group was obtained. These data provide quantitative information on the specific food intake of the following nutrients: calcium, iron, sodium, vitamin A, vitamin C and thiamine. Chicken contributes the most to calcium (17.3%), sodium (9.3%) and vitamin A (32.5%). Our findings also showed that fried rice contributes mainly to iron (22.3%), malt beverages as the main contributor to thiamine (12.2%), and the main contributor to vitamin C is green leafy vegetables (19.1%). These data may provide a basis for the selection of foods to be included in dietary assessments and quantitative food frequency questionnaires for epidemiological studies in Malaysia.

B03 Validity and reliability of web based interactive dietary assessment tool among university students in UniSZA

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Over the past few decades, new technologies have been developed to enhance accuracy, increase speed and minimize the cost and inconvenience of assessing dietary intake. Web based dietary assessment tool is a rising and unique method in measuring nutrients and food group. This crossover study was carried out to determine the validity and reliability of web based interactive dietary assessment tool among university students in Universiti Sultan Zainal Abidin (UniSZA). Two references methods were used in this study, which are 24-hour diet recall and paper based Food Frequency Questionnaire (FFQ). Anthropometric measurements comprised of weight and height were also recorded. Participants were 91% Malays (n=81), 6% Chinese (n=5) and 3% Indians (n=3). Out of total sample, 45% of participants were males while 55% were females. The mean age of participants was 18.6 years. For validity, the results showed that cross classification of nutrients and food groups indicated that a high proportion of rankings of intake were being classified into the same and adjacent quartile. However, intraclass correlation coefficient (ICC) showed poor agreement for most of nutrients and food groups. Meanwhile, for reliability, both cross classification and ICC showed that the web based FFQ has moderate reliability. Bland-Altman plot also showed that the web based FFQ has an acceptable validity and moderate reliability. Triad method that is used in this study concluded that the greatest validity coefficient was found for paper FFQ. As a conclusion, the web based FFQ has an acceptable validity and moderate reliability. The web based FFQ also demonstrated a greater group level validity and reliability compared to an individual-level validity. Therefore, it should be used in an epidemiological setting rather than a clinical setting.

B04 Determination of meal provision appropriateness based on therapeutic diet among inpatients at Hospital Universiti Sains Malaysia (Hospital USM), Kota Bharu, Kelantan

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The objective of this study was to determine meal provision appropriateness among inpatients at Hospital USM based on their therapeutic diet. A total of 345 subjects were recruited and analysed in this study. The appropriateness of meals based on the patient's therapeutic diet was observed during meal distribution, obtained by using the self-data collection tool. Data from the medical record of each patient were collected to ensure that the patients received an accurate diet as indented by the dietitian based on their health condition. Standard Operational Procedure (SOP) elements that may lead to inappropriateness were assessed throughout the spectrum of meal provision to the patients. The result showed that 94.5% of the meal provision at Hospital USM was appropriately provided while the inappropriateness was only 5.5%. The SOP elements and the appropriateness of meal distribution based on a therapeutic diet for inpatients at Hospital USM wards presented a significant relationship. These findings provided fundamental information, generally to the stakeholder and specifically to those who directly involved in the foodservice system

to always follow the stated SOP to minimize meal inappropriateness in meal provision for inpatient care at Hospital USM. Besides, it would minimise the food wastage and wisely utilize the financial resources if they provided an appropriate diet to the inpatients at Hospital USM.

B05 Relative validity of food frequency questionnaire (FFQ) on 3-day diet recall among older adults

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A valid and reliable food frequency questionnaire (FFQ) designed for a targeted population is essential to estimate and quantify dietary intake among older people accurately. However, the validity of FFQ that is used consistently on the elderly is scarce and debatable. This study aimed to assess the validity and the agreement of FFQ on 3-days 24-Hours Diet Recall (HDR) among the elderly. A total of 135 older adults (age ≥60) were randomly selected for this study. A face-to-face interview was done for FFQ and 24-HDR. Subsequent assessment for 2-days 24-HDR was conducted by telephone interview. Paired t-test was used to determine the mean difference, while Pearson correlation coefficient test was used to assess the correlation of nutrient of both methods. Bland Almont plot was applied to determine the agreement between both methods. There is a significant mean difference of nutrients ($p<0.05$) between FFQ and 3-days 24-HDR except for fat, fibre, sugar, vitamin A, vitamin D, vitamin C and iron. Vitamin D showed the strongest correlation for both methods ($r=0.746$). Although significant, there was a low correlation found in fibre, vitamin A, vitamin K, vitamin C, iron, energy and fat. This study revealed a moderate agreement between dietary derived from FFQ and 24-HDR. The FFQ method is comparable as 24-hours dietary recall as most of the nutrients were significantly correlated except for carbohydrate, protein, sugar, vitamin E, sodium, potassium, calcium and phosphorus. This study provides new insight into the validation of FFQ among elderly.

B06 Associations between breakfast consumption and body composition indicators among school-aged children: a sample from urban-poor community settings in Malaysia

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The prevalence of obesity among Malaysian children population has increased throughout the years. Previous study has investigated the impact of breakfast consumption and body weight status as well as body composition among Malaysian children and adolescents. However, there are lacked of similar studies that focus on the urban-poor community in Malaysia. This study aimed to investigate the associations between breakfast consumption and body composition indicators among urban poor children in Malaysia. A cross-sectional study was conducted at 20 urban-poor communities in the central region of Peninsular Malaysia. A total of 900 school-aged children (male: 64.3%; female: 35.7%), with a mean age of 9.67±1.65, were recruited for the present study. Their body height, weight, waist circumference, fat mass (FM), body fat percentage (BF%), skeletal muscle mass (SMM)

were measured. The mean body mass index-for-age (BAZ) among school-aged children was -0.25±1.69 whereby 65.7% of them have normal body weight status, 8.9% and 3.2% of them classified as thinness and severe thinness, and 9.6% and 12.6% of them were overweight and obesity, respectively. On the other hand, the mean FM, BF% and SMM of the children were 7.22±6.57kg, 20.8±10.5%, and 11.85±3.49kg, respectively. The mean breakfast consumption of the children is 3.86±2.48 times/week, whereby 70.0% of the children are breakfast skipper (skipped at least 1 breakfast/week). The present study found that there are no significant associations between breakfast consumption and body composition indicators, except for SMM (r=-0.098; p=0.009), yet, the association is negligible. This could be due to the total calories intake plays a more important role than breakfast consumption among the urban poor children. In conclusion, 22.2% of the children are overweight and obese and 70.0% of the children are breakfast skipper, whereas breakfast consumption has negligible association with SMM of the children. Future studies should investigate the nutrient intake of the children and its association with the children's body composition.

B07 Knowledge, attitude and practice of periconceptional folic acid usage among women delivered at Hospital Universiti Sains Malaysia, Kelantan

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The aim of this cross-sectional study was to determine the knowledge, attitude and practice of periconceptional folic acid usage and their associations with sociodemographic and obstetrics characteristics among women delivered at Hospital Universiti Sains Malaysia (USM), Kelantan. A total of 382 respondents aged 18 – 47 years were recruited from postnatal ward, Hospital USM based on the inclusion criteria. Respondents were selected through purposive sampling method. A validated self- administered questionnaire in Malay language was used in data collection. The questionnaire consisted of five parts included sociodemographic, obstetrics characteristic, knowledge, attitude and practice of folic acid used. The data was analysed with descriptive analysis and Pearson's chi-square test with the significance level of $p<0.05$. Current findings demonstrated that 92.7% postnatal mothers heard of folic acid. The most common sources of information were from nurses (55.1%), physician/gynaecologists (50.3%) and media (18.9%). Majority of the respondents indicated with adequate knowledge level (92.9%) and positive attitude (72.0%) but portrayed poor practice (66.7%). Sociodemographic characteristics such as age group ($p=0.027$), occupation ($p=0.030$) and educational level ($p<0.001$) were significantly associated with level of knowledge; occupation ($p=0.009$) and educational level ($p<0.001$) associated with level of attitude along with monthly household income ($p=0.003$); and educational level ($p<0.001$) were significantly associated with level of practice. Among all the obstetric characteristics, number of live birth/ parity was significantly associated with level of knowledge ($p=0.002$) and level of attitude ($p=0.039$). Postnatal mothers from young age group (18 – 25 years), housewives, low income and higher parity group were more likely with inadequate knowledge, negative attitude and poor practice whereas those with tertiary education had adequate knowledge, positive attitude and good practice on periconceptional folic acid usage.

B08 Gender and age differences in diet diversity among Aboriginal school children in Negeri Sembilan

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Diet diversity is a qualitative measure of food consumption that reflects household access to a variety of food groups. The objectives of this study are to assess the diet diversity and determine gender and age differences in diet diversity among Aboriginal children. This cross-sectional study was conducted among 173 Aboriginal children from three Aboriginal primary schools in Negeri Sembilan. Malaysian Adapted Nutrition Survey (MANS) food frequency questionnaire was used to record the consumption of different food types in seven food groups. Dietary Diversity Score (DDS) was calculated based on two measures: Food Group Score (FGS) and Serving Size which were constructed based on the Malaysian Dietary Guidelines for Children and Adolescents. IBM SPSS Statistics software was used to conduct data analysis. The total DDS showed that 88% of the Aboriginal children had a diverse diet. The FGD showed that a higher proportion of the Aboriginal children consumed diverse meat/fish/egg products (95%), followed by fruits (67%), cereal/grains products (62%) and legumes/lentils (60%). However, a higher proportion of the Aboriginal children consumed less diverse vegetables (74%) and milk/dairy products (79%). A higher proportion of boys (52%) consumed less diverse vegetables compared to girls (38%) (X^2= 7.377, p=0.025). There are direct significant relationships between age and DDS in cereal/grains (r=0.16, p=0.043), legumes/lentils (r=0.19, p=0.018), meat/fish/egg (r=0.18, p=0.022) and milk/dairy (r=0.19, p=0.014) consumption. In conclusion, Aboriginal children have a diverse diet respective to food groups. However, there is still a need for dietary intervention especially on vegetables and milk/dairy products consumption among Aboriginal children to promote healthy, diversified diets consisting of nutrient-rich sources of food.

B09 Consumers' perceptions of healthy food availability in online food delivery applications (OFD apps) and its association with food choices among public university students in Malaysia

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This retrospective cross-sectional study was conducted to study consumers' perceptions of healthy food availability in online food delivery applications (OFD apps) among public university students in Malaysia and its association with their food choices. A total of 290 subjects aged 19–29 years old participated from 20 public universities in Malaysia via snowball sampling. Data was collected through online questionnaire which consisted of sociodemographic status, use of OFD apps (most frequently used brand, usage frequency, food choice and expenditure per transaction) and consumers' perceptions of healthy food availability in OFD apps. The most frequently used apps among the subjects was Food Panda (46.6%), however, majority of the subjects in this study (41.4%) rarely used

OFD apps. Also, most of the subjects ordered unhealthy food (77.6%) and spent up to RM15–RM19 for each transaction (43.1%). There was no significant difference between the use of OFD apps and gender ($p>0.05$). Majority of the subjects (76.9%) had a negative perception of healthy food availability (variety, price and quality of healthy food) in OFD apps. No significant association was found between consumers' perceptions of healthy food availability in OFD apps and their food choices made in OFD apps among the subjects in this study ($p>0.05$). In conclusion, most Malaysian public university students perceived that there is not much variety of good quality healthy food and affordable price, available in OFD apps. This finding suggests that online food environment in Malaysia might be unhealthy. More studies are needed to explore the online food environment particularly its impact to the community health and wellbeing. Public health professionals and policy makers need to address the online food environment issues as part of the obesogenic food environment in Malaysia especially when OFD service is one of the latest trends in this country.

B10 Association between dietary vitamin D intake and haemoglobin concentration among female students in Faculty of Medicine and Health Sciences, Universiti Putra Malaysia

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Anemia is a common nutritional problem affecting all ages including reproductive-aged women. Lack of dietary intake demonstrated to contribute to anemia prevalence worldwide. There has been recent emerging evidence of the utilization of vitamin D in enhancing iron absorption leading to improved haemoglobin (Hb) concentration but there is paucity of supporting literature, specifically in Malaysia. The objective of this study was to investigate the association between dietary vitamin D intake and Hb concentration among female students in UPM. A cross-sectional study was carried out in 94 female students (mean age ± S.D: 22.34 ± 1.2 years). A self-administered socio-demographic and sun exposure questionnaires were used to assess participant's background and sun exposure index (SEI). Other measurements include anthropometric (SECA), Hb concentration (Hemocue Hb 201+) and vitamin D intake (24-hr recall). Pearson correlation test was performed to determine the association between dietary vitamin D and Hb concentration ($p<0.05$). The prevalence of anemia among participants was 37.3%, with a mean±SD Hb of 12.1±1.2 g/dL and majority of participants had low SEI (mean±SD: 0.1±0.2). The mean±SD of dietary vitamin D intake was low (1.0±1.9 μg), and no significant association observed between vitamin D intake and Hb concentration ($r=0.03$, $p=0.77$). Despite the non-significant association observed between vitamin D and Hb concentration, the study found positive association between dietary iron intake (assessed as part of potential confounders) with Hb concentration ($r=0.26$, $p=0.04$). This study demonstrates that dietary vitamin D intake from the diet might not have a substantial impact on Hb concentration. However, there is a need for dietary intervention to address the lack of vitamin D intake from diet which potentially has an enhancer effect of iron status, demonstrated in previous studies.

B11 Associations of personal factors, maternal factors, and mother-daughter interaction with disordered eating among female adolescents in Petaling Perdana, Selangor

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Mothers are perceived as primary socialization figures who transmit messages to adolescents about their appearance and eating behaviors. This cross-sectional study aimed to determine factors associated with disordered eating among female adolescents in Petaling Perdana district, Selangor. A total of 191 mother-daughter pairs from five randomly selected secondary schools in Petaling Perdana district, participated in this study. Both adolescents and their mothers were required to complete different sets of questionnaires that assess socio-demographic characteristics, body image perception, eating behaviors, perceived appetite, fat talk, maternal comments, and maternal modeling and relationship quality among daughters and mothers. A total of 17.3% of daughters and 14.1% of mothers had disordered eating with mean disordered eating scores of 12.86±8.79 (daughter) and 10.57±8.45 (mother), respectively. A high prevalence of overweight and obesity was found among adolescents (28.3%) and their mothers (45.1%), respectively. While maternal disordered eating was weakly correlated with disordered eating of adolescents ($r=0.166$, $p<0.05$), maternal BMI was not significantly correlated with disordered eating score of adolescents ($r=0.140$, $p=0.053$). Obese adolescents had significantly higher disordered eating scores than their counterparts ($F=2.807$, $p<0.05$). Significant correlations were found between maternal comments ($r=0.168$, $p<0.05$) and maternal modeling ($r=0.147$, $p<0.05$) and disordered eating. Multiple linear regression analysis showed that more frequent fat talk between daughters and mothers ($\beta=0.263$, $p<0.001$), higher daughters' BMI ($\beta=0.155$, $p<0.05$), lower frequency of meal consumption among daughters ($\beta=-0.145$, $p<0.05$) and being Indians ($\beta=0.185$, $p<0.05$) contributed towards disordered eating among female adolescents ($F=7.337$, $p<0.001$). In short, approximately one-fifth of the female adolescents and their mothers had disordered eating. The findings highlighted the importance to foster healthy mother-daughter interactions (limiting engagement in fat talk) among mother-daughter pairs to co-manage disordered eating among female adolescents. It is suggested that mother-daughter interaction should be incorporated in future disordered eating intervention for female adolescents, particularly among those who have higher BMI and Indians.

B12 Accuracy of self-reported food intake among primary school children aged 7-9 years

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Dietary assessment of children is important to ensure that children get sufficient energy and nutrients. However, accurate recall of food intake is challenging, especially for young children with their limited cognitive abilities. Therefore, this study was conducted to determine the accuracy of primary school children aged 7-9 years in reporting their food intakes for one meal in a day. A total of 105 children (54 boys, 51 girls) aged 8.0±0.8 years were recruited from three selected primary schools in Puchong, Selangor. Individual meal intakes during school recesses were determined using a food photography method (i.e. reference) and children were interviewed on the next day to recall their recess meal

intakes on the previous day. The reference and reported food items were compared to calculate match, omission and intrusion rates expressed as percentages. Results showed that the match rate for subjects in reporting food items were 85.3%. The overall omission rate (14.2%) was higher than the overall intrusion rate (3.2%). Among food items that were eaten but not recalled were condiments in a mixed meal such as bean curds and vegetables. Grapes and fish were examples of food items that were recalled but not actually eaten by the children. Based on this high match rate and low omission and intrusion rates, we conclude that 7-to-9-year-old school children are able to self-report their previous-day intake of food items accurately.

B13 Correlations of socio-demographic characteristics, parental feeding practices, parents' milk intake and children eating behaviours with milk intake among primary school children

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This cross-sectional study aimed to determine the correlations of socio-demographic characteristics, parental feeding practices, parents' milk intake and children eating behaviour with milk intake among primary school children. A total of 147 children (mean age of 9.74±1.50 years) were recruited from three primary schools in Selangor, Kedah and Negeri Sembilan. A set of parental-administered questionnaire, which consisted of socio-demographic characteristics, parental feeding practices, children eating behaviour and milk intakes of both children and their parents, was answered by their parents. Results showed that less than half of the children consumed milk daily (Daily: 44.9%; Weekly: 24.5%; Never: 30.6%), with a mean intake of 326.42±312.65 ml/day. The most common types of milks which children preferred were fresh milk or UHT milk and low-fat milk. Boys (389.01±355.78 ml/day) drinks more milk than girls (272.93±262.07 ml/day; $t=1.893$, $p<0.05$). Besides, a higher milk intake of parents was moderately correlated with a higher milk intake of their children ($r=0.662$, $p<0.01$) with a large Pearson correlation coefficient. As for parental feeding practices, the finding showed that a higher parental encouraging balance and variety in their feeding practice was significantly correlated with higher milk intake of children ($r=0.210$, $p<0.05$), while the more frequent feeding practices of emotional regulation ($r=-0.215$, $p<0.05$), used of food as reward ($r=-0.223$, $p<0.05$) and restriction for health ($r=-0.204$, $p<0.05$) were correlated with lower milk intake of the children. Moreover, children who have higher emotional over-eating was correlated with a lower milk intake ($r=-0.276$, $p<0.01$). In conclusion, the findings showed that approximately half of the school-aged children did not consume milk daily and parental involvement plays an important role in cultivating milk drinking habits in school-aged children. Future nutrition and health promotion programs for primary school children shall involve both children and their parents and emphasize on the importance of milk drinking habits.

B14 Association between picky eating behaviour with weight status and cognitive function among schoolchildren in Kuala Lumpur, Malaysia

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Picky eating behaviour in childhood can be linked to weight and cognitive related issues due to limited dietary variety and nutrient intake. To date, limited information related to picky eating behaviour among school children is available in Malaysia. Hence, this study aimed to determine the association between picky eating behaviour with weight status and cognitive function of school children in Kuala Lumpur, Malaysia. A total of 339 school children aged 7 to 9 years participated in this cross-sectional study. Socio-demographic factors, eating behaviours and dietary habits were assessed through a parent-child self-reported questionnaire. Height and weight were measured and body mass index (BMI) was determined. The distribution of male and female children was 48% and 52% respectively. The mean child age was 8.03±0.81 years old. One third (38%) of the school children were picky eaters. Picky eaters were more likely to be severely thin/thin (7%) and normal in BMI (77%) compared to non-picky eaters (6%; 58%) and this was found to be significant (χ^2=15.541, p<0.001). Picky eaters consumed lesser vegetables (χ^2=4.487, p=0.034), fish (χ^2= 5.548, p = 0.019) and more milk and dairy products (χ^2=3.907, p=0.048), snack foods (χ^2=6.252, p=0.012) and fast food (χ^2=7.350, p=0.007) as compared to non-picky eaters. Meanwhile, parents of picky eaters were more likely to use instrumental (z=-3.75, p<0.001) and emotional (t=-2.27, p=0.02) feeding styles and less likely to monitor their child's diet (z=-2.43, p=0.02) as compared to parents of non-picky eaters. When comparing in terms of cognitive function, picky eaters were more likely to have poorer cognitive function compared to non-picky eaters (χ^2=10.518, p=0.005). As picky eating behaviour may adversely affect children's growth and development, targeted intervention should be considered to tackle picky eating behaviour through effective nutrition education at young age.

B15 Correlates of healthy eating-self efficacy among secondary school students in Kuala Lumpur, Malaysia

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Self-efficacy theory relates to the perception of an individual on their ability or capacity to accomplish certain task. It plays an important role in preventing obesity through health behaviour such as healthy eating. As the statistics of childhood obesity was increasing in Malaysia, there is a need to emphasise healthy eating habits during adolescence to prevent it endure into adulthood. However, the availability of appropriate data to study on the correlates of healthy eating self-efficacy in Malaysian population is limited. The objective of this study was to examine the correlates of healthy eating-self efficacy among secondary school students in Kuala Lumpur, Malaysia. The correlates used to test the correlation between healthy eating self-efficacy were body image satisfaction and life satisfaction. This was a cross sectional study and total of 392 students were recruited in

this study from three public secondary schools in Kuala Lumpur, aged between 13 and 19 years old. The information on healthy eating self-efficacy, body image satisfaction and life satisfaction were collected through self- administered questionnaires from validated scales which consist of 46 items including sociodemographic questions. Pearson correlations and correlation coefficients were identified at the significant level of <0.05. Healthy eating self-efficacy was not significantly positively correlated with body image satisfaction (HEWSE and PACS-R, r=0.025, p>0.05; SE-HEPA and PACS-R, r=0.064, p>0.05). However, healthy eating self-efficacy was significantly positively correlated with life satisfaction (HEWSE and SLSS, r= 0.259, p<0.001; SE-HEPA and SLSS, r=0.280, p<0.001) among secondary school students in Kuala Lumpur. Life satisfaction of adolescents in Kuala Lumpur was weakly correlated with healthy eating self-efficacy. Therefore, other correlates of healthy eating self- efficacy should be identified in the future and studies should be conducted in other states in Malaysia to represent the adolescent population in Malaysia.

B16 The effects of bitter taste sensitivity on parent-reported vegetable intake and liking in children

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Variation in sensitivity to bitter tastes can be explained by taste genotypes and phenotypes. *TAS2R38* gene codes for the T2R38 taste receptor which specifically detects bitter taste from the thiourea moiety that is within the structure of glucosinolate (GSL) compounds, which can be found in *Brassica* vegetables. Studies have shown that vegetable consumption and liking are influenced by bitter taste sensitivity, thus the present study aimed to investigate the effects of taste genotypes and phenotypes on parent-reported vegetable intake and liking in children. A parent-completed questionnaire was used to assess vegetable intake frequency and vegetable liking in 132 children aged 3 to 5 years old. *TAS2R38* and gustin *(CA6)* genes were genotyped from saliva. Fungiform papillae density (FPD) were counted from tongue images and 6-n-propylthiouracil (PROP) taster status was determined. Results showed that although there were no significant effects of *TAS2R38, CA6*, PROP taster status and FPD on intake of vegetables collectively (*Brassica*, non-*Brassica* and total vegetables), there were some significant effects of these genotypes and phenotypes on intake of specific vegetables. In addition, FPD had significant effects on liking of *Brassica* and total vegetables. Vegetable intake and liking were positively correlated demonstrating, as expected, that as intake increases, liking increases and vice versa.

B17 Association between dietary calcium intake and haemoglobin concentration in female students in Faculty of Medicine and Health Sciences, Universiti Putra Malaysia

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Anemia affected approximately 26.4% of Malaysian adults, and iron deficiency anemia (IDA) which resulted from poor dietary intake demonstrated to be the most prevalent type. Women in Malaysia consumed mostly plant-based iron sources, which has poor

bioavailability. Calcium was shown to be one of the iron absorption inhibitors with unclear underlying mechanisms and limited published evidence, especially in local setting. This study was carried out to determine the association between dietary calcium intake and Hb concentrations among students in UPM. A total of 109 participants (mean age (±S.D): 22.25±1.17 years) were included in the study. A set of questionnaires was used to determine socio-demographic factors whilst anthropometric measurements were used for physical characteristics. Dietary calcium intake was determined using a 24-hour dietary recall (24HR) and 3-day diet history (DH). Hb concentration (Hb 201+ Analyzer) was used to define anemia (WHO cut-off of <12g/dl). Spearman or Pearson correlation tests were used to assess the association between variables. The prevalence of anemia observed was 38.5% with mean±SD of Hb concentration of 12.08±1.30 g/dl. The mean±SD calcium intake of participants were 479.29±430.64 mg (24HR) and 460.74±282.69 mg (DH) respectively. There was no significant association found between dietary calcium intake measured by 24HR (r=0.127, p=0.188) and DH (r=-0.022, p=0.821), however, further analysis observed a strong positive significant association between dietary iron and calcium intakes (r=0.594, p=0.001). Despite the non-significant association observed between calcium and Hb concentration, calcium intake was demonstrated to be associated with iron intake, which may indicate possible connection with iron absorption but not to the extent where it affects haemoglobin concentrations. With the findings, there is urgency in addressing anemia occurrence and the importance of calcium intake, especially among university students.

B18 Eating behaviour and its association with anthropometric indicators among secondary school teachers in Shah Alam, Selangor

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Over the years, escalating rates of overweight and obesity is becoming a global concern. Malaysian school teachers showed to be a vulnerable group as their prevalence of overweight and obesity surpassed the 2015 National Health and Morbidity Survey (NHMS) which was 33.4% and 30.6%, respectively. Hence, this cross-sectional study aims to evaluate eating behaviour and its association with anthropometric indicator of secondary school teachers, sampled from four secondary schools in Shah Alam, Selangor. This study included a total of 101 participants (n=101) with mean age of 40.63 9.39 years. This study used Dutch Eating Behaviour Questionnaire (DEBQ), along with other measurements such as sociodemographic status and anthropometric measurements (height, weight, BMI, waist circumference, body fat percentage) of the respondents. Most of the teachers experienced moderate emotional eating (50.5%), external eating (70.3%) and restrained eating (69.3%) behaviours. The prevalence of overweight and obese were 22.8% and 50.5%, with 23.8% of the teachers having normal weight and a smaller percentage (3.0%) were underweight. Male teachers had higher waist circumference (90.1±13.0 cm) and body fat (26.3±7.3 %) as compared to female teachers (waist circumference = 86.8±10.4 cm; body fat = 34.6±5.0 %). Emotional eating (r=0.419, p<0.01) and restrained eating (r=0.325, p<0.01) were significantly associated with BMI, and the same patterns can be observed between eating behaviour and waist circumference of the teachers (p<0.01). All three components of DEBQ were significantly associated with body fat percentages (p<0.05). In conclusion, the schoolteachers in this study experienced varying levels of emotional, external, and restrained eating behaviour and were associated with anthropometric indicators. Intervention to promote healthy eating behaviour could be conducted to improve overall health and wellbeing, especially among these working adults' population.

B19 Factors influencing food preferences among international students in Universiti Putra Malaysia

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Food preference related studies among international students are carried out to understand and emphasize their needs and their issues on food and the roots of these issues including availability, accessibility and affordability of food. This study aimed to determine factors influencing food preferences of international students in Universiti Putra Malaysia. This was a cross-sectional study and a total number of 649 respondents were recruited by using random sampling method. A twenty-minute online questionnaire that consisted of seven different sections was used to determine socio-demographic characteristics, physiological factors, food environment, general acculturation, food choice motives, general nutrition knowledge and food preferences. The food preference questionnaire required participants to rate their preference of 77 individual foods on a Likert scale, ranging from dislike a lot to like a lot. Pearson and Spearman Correlation, one-way ANOVA, Mann Whitney U test and multiple linear regression were applied to the research objectives. The number of subjects recruited in this study was higher in males (60.7%) than females (39.1%). They were mainly Arap (37.2%) and Asian (33.8%) and marital status of respondents were mostly single (67%). The results showed that gender (β=-0.125, p=0.002), household composition (living with friends or family) (β=0.090, p=0.023), food availability (β=0.182, p<0.001), food affordability (β=-0.165, p<0.001), nutrition knowledge about diet/ill management (β=0.257, p<0.001), price (β=0.179, p<0.001), weight control (β=-0.149, p=0.001), health (β=0.159, p=0.002) and natural content (β=0.250, p=0.001) were significantly influenced on food preferences among international students in Universiti Putra Malaysia. In conclusion, there were several unique issues including the limitation in the food availability and affordability, the motives and low level of nutrition knowledge specifically related to international students' food preferences as a result of adjusting Malaysian culture. This study can help to identify challenges to improve the food environment on university campuses. During orientations, universities could raise the consciousness of international and ethnic food stores in addition to local grocery stores. The results of this study can also be used by the ministry of agriculture and food industry. The ministry with the collaboration of food industry might put fresh fruit stalls in university campuses all over the country to enhance fresh fruit consumption. However, a more comprehensive study among all international students throughout Malaysia is recommended.

B20 Association between food choices in school canteen and weight status of Aboriginal children in Negeri Sembilan

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Malnutrition was a common problem in Aboriginal children due to poor food environment. The school food environment is a crucial factor because children spend many hours a day in the school environment and eat at least one, and sometimes two, meals while at school. This study aims to determine the association between food choices in school canteens and weight status of Aboriginal children. This is a cross-sectional study conducted in three Aboriginal primary schools in Negeri Sembilan involving 195 Aboriginal children. Food choices were assessed using a validated school food environment semi-quantitative

food frequency questionnaire. WHO AnthroPlus software was used to calculate BMI-for-age (BAZ) and all the data was analysed using IBM SPSS Statistics software. The most frequently consumed food in school canteen was white rice, followed by fried chicken, fried egg, mixed vegetables, and red apple, while the least consumed food was laksa, kuih puding jagung, kuih sagu mata ikan, pulut bakar and sandwich. There is a significant relationship between BAZ and the consumption of cream bun (r=-0.19, p=0.01), sandwich (r=-0.25, p=0.001), fried fish (r=0.24, p=0.001), cultured milk drink (r=0.18, p=0.016), *kuih kaswi* or *kuih koci* (r=0.17, p=0.022), *kuih sagu mata ikan* (r=0.25, p=0.001), jelly (r=0.15, p=0.05) and milk biscuit (r=0.17, p=0.026). A student with frequent consumption of meat-based foods (0.72 vs 0.17, t=-2.336, p=0.021), fish products (1.17 vs 0.26, t=-3.24, p=0.001) and milk (0.89 vs 0.26, t=-2.518, p=0.03) has significantly higher BAZ. Although the Ministry of Education of Malaysia has already implemented the Healthy School Canteen Guidelines since 2011, there is a serious need to review on the food preparation method to control the sugar and fat content to improve the quality of food served to school children as well as to maintain a healthy weight status.

B21 The prevalence of breakfast consumption and its relationship with body weight status among primary school children

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The objective of this cross-sectional study was to examine the prevalence of breakfast consumption and its relationship with body weight status among primary school children aged 10-11 years in Kedah. Using convenience sampling, this study included 128 (60 boys and 68 girls) Standard Two primary school children in Kulim, Kedah. Children's height and weight were measured and BMI-for-age were determined and classified using the World Health Organisation (WHO 2007) standards. A short questionnaire was used to determine breakfast consumption on the one-day school visit. Overall, the children recorded mean BMI-for age of 0.38 (SD±1.6), with 35.9% (n=46) and 6.3% (n=8) children who were overweight/obese and underweight, respectively. The prevalence of breakfast consumption was high (77.3%), with only 29 (22.7%) who reported did not have breakfast on the data collection day. The prevalence of breakfast consumption was higher among girls (82.4%) compared to boys (71.7%, $p<0.05$). Children who were of normal weight were more likely to have breakfast (85.1% ate breakfast) than those who were overweight or obese (67.4%). Breakfast consumption was associated significantly with body weight status ($\chi^2=6.17$, $\phi'=0.22$, $p<0.05$). The preliminary analysis of this study suggested that consumption of breakfast is associated to body weight status. However, further studies of a larger sample would be required to confirm this finding.

B22 Determination of spatial distribution of types and quality of food and beverage outlets available onsite and around major public hospitals in Kota Bharu, Kelantan: Geographic Information System (GIS) analysis approach

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Food environment could influence an individual's dietary eating behaviours that subsequently could affect the development of diet-related chronic disease risks. The aim of the present study was to assess the spatial distribution of types and quality of food and beverage outlets located both onsite and within 1km radius distance of surrounding areas within two major public hospitals namely, Hospital Universiti Sains Malaysia (Hospital USM) and Hospital Raja Perempuan Zainab II (HRPZ) in capital city of Kelantan by using the Geographic Information System (GIS) approach analysis. Detailed information of location, types of food outlets, types and quantity of food and beverage sold from each outlet were obtained. Classification of food and beverages from each outlet were then classified into 7 main food groups. The healthiness of pre-packaged food and beverages available onsite were assessed by Traffic Light Food Classification System (TLS). The results showed that majority of food outlets surrounded in both hospitals were hawker stall outlets (67-71.1%), followed by fast food outlets (2.2-7.9%). Comparisons between main food groups found that majority of food types sold were cereal and Grain-based products, whereas legumes and nut-based food was the least food sold around these hospitals. Hospital USM had mostly less-healthy pre-packaged food and healthy pre-packaged beverage while HRPZ had medium-healthy pre-packaged food and both healthy and medium-healthy pre- packaged beverage. These findings might be useful in conducting future researches in wider scopes and as a baseline guide to implement healthy hospital food environment policy in order to improve the healthy eating choices within the hospital areas and thus, reducing the risks of obesity and non-communicable diseases.

B23 Assessment of sugar consumption pattern among primary school children in Kuala Lumpur

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Sugar is often associated with various health problems such as obesity, Type II Diabetes (2DM) and cardiovascular disease (CVD). This study was then conducted to determine the pattern of sugar consumption among primary school children in Kuala Lumpur. This was a cross-sectional study involving primary school children aged 10 to 11 years. Socio-demographic background was obtained through a questionnaire. Weight, height and waist circumference were measured and Body Mass Index (BMI) was identified. Sugar intake was determined using two days diet recall while the main sources of sugar were determined using the questionnaire on habitual intake of sugary foods and beverages. A total of 190 subjects from five primary schools were involved and mostly were Malays (63.7%), then Chinese (26.3%) and Indian (10.0%). 32.1% of boys and 29.3% of girls were overweight and obese. 21.9% of boys and 15.1% of girls were centrally obese. The main sources of sugar from beverages was self-prepared drinks (95.3%) while from food was bread and variations (87.9%). The average sugar intake was 62.86±25.59 g per day, contributed to 251±102 kcal (15.5% TEI) which was already exceeded the recommendation RNI (<10% TEI). Sugar intake on weekend (65.58±26.86 g) was significantly higher than on weekdays (58.53±25.88 g) ($p<0.001$). There was a significant difference between sugar intake among gender ($p=0.001$) and ethnicity ($p<0.001$). The study found that sugar intake in primary school children was high and about 79% subjects exceeded the recommendation of RNI. Education and nutrition intervention should be conducted to increase awareness and limit sugar intake.

B24 Association between disordered eating and health-related quality of life among university students in Klang Valley

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Disordered eating (DE) behaviour was shown to affect the health-related quality of life (HRQoL). This study aimed to determine the association between DE and HRQoL among university students in Klang Valley. A cross-sectional study was conducted among 189 university students (males=32.8%, females=67.2%, mean age=22.1±2.8 years) in two universities in Shah Alam and Serdang. This study utilised a self-administered questionnaire consists of socio-demographic information, anthropometric measurements, Eating Attitudes Test (EAT-26) to assess the DE status and 36-Item Short Form Survey (SF-36) to assess the HRQoL. Data collection was conducted either by using printed questionnaire or Google Form. Pearson's correlation was used to analyse the data. The prevalence of DE was 25.4% (19.4% in males, 28.3% in females). The prevalence of overweight and obesity were 15.3% and 16.9%, respectively. About 20.7% of overweight and 21.9% of obese respondents were having DE. There was no significant association between BMI and DE (r=0.012, p=0.875). Among eight subscales of HRQoL, there was significant association between BMI and two subscales of HRQoL, which were general mental health (r=0.207, p=0.004) and bodily pain (r=0.153, p=0.036). Meanwhile, there was significant association between DE with four subscales of HRQoL, which were physical functioning (r=-0.183, p=0.012), role limitations due to physical health (r=-0.155, p=0.033), role limitations due to emotional problems (r=-0.232, p=0.001) and general mental health (r=-0.214, p=0.003). These results indicate that higher DE associated with poorer HRQoL, specifically physical functioning, role limitations due to physical health, role limitations due to emotional problems and general mental health, among university students. This study suggests the need to add the component of DE in future nutrition intervention to improve the HRQoL among university students.

B25 Prevalence of geriatric malnutrition and its associated factors among residents at Rumah Seri Kenangan Cheras Selangor

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Geriatric malnutrition can be defined as all forms of poor nutrition relating to elderly. It can be categorised into undernutrition, micronutrient-related malnutrition as well as overnutrition and may cause diet-related non-communicable diseases (NCDs) such as diabetes, heart diseases and stroke. This study aimed to determine the prevalence of geriatric malnutrition and its associated factors among residents at Rumah Seri Kenangan Cheras, Selangor. A cross-sectional study was conducted among 81 residents at Rumah Seri Kenangan Cheras, Selangor. The respondents completed researcher-administered questionnaires on socio-demographic characteristics, medical history, mealtime experience, lifestyle factors, depression and geriatric malnutrition. Anthropometric measurement,

handgrip strength assessment were obtained using standard procedures. Dietary intake was assessed by two-day diet history. The prevalence of geriatric malnutrition among the respondents was 16.1%. Almost half of them had a normal weight (48.1%) while 58.0% and 25.9% had abdominal obesity and muscle wasting, respectively. Most of them consumed daily energy (91.4%) as well as fruits and vegetables (86.4%) below the recommended requirement. More than half of them were also satisfied with their mealtime experience (70.4%), participated in physical activity (59.3%), non-smoker (70.4%), non-drinker (95.1%), had depressive symptoms (63.0%) and had weak handgrip strength (69.1%). Body mass index ($p<0.001$), waist circumference ($p<0.05$), calf circumference ($p<0.001$), fruits and vegetables consumption ($p<0.05$), functional status ($o<0.05$) and depression ($p<0.05$) were all correlated significantly with geriatric malnutrition. The findings confirmed that geriatric malnutrition were prevalent among institutionalized elderly people and this situation urged for appropriate multidimensional nutritional approach in order to improve their nutritional status, health and quality of life of the elderly.

B26 Diet quality and eating habits among adolescents from secondary school of urban and rural areas in Sandakan, Sabah

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Adolescents need a good diet quality to achieve optimum growth and development. The different on socio-demographic and living area of both urban and rural areas have affected the diet quality of adolescents. This study aims to evaluate and compare diet quality and eating habits of adolescents between urban and rural secondary schools in Sandakan, Sabah. A total of 400 school adolescents were randomly selected with 200 subjects respectively from urban and rural schools. Data collection includes anthropometric measurements, 24-hour diet recall for two days and questionnaires which includes socio-demographic information, eating habits and Healthy Eating Index (HEI) to determine the diet quality of adolescents. Urban and rural adolescents showed a significant different for frequency of eating out ($p=0.006$), taking dinner ($p=0.047$), fruit intakes ($p=0.001$), snacks ($p=0.002$) in a week and option place for dining when eating out ($p<0.01$) such as canteen, food stall and fast food restaurant. There was a significant differences in the serving size of cereals and grains ($p=0.002$), legumes ($p=0.004$), sodium intake ($p=0.033$) and HEI score ($p=0.001$) between urban and rural male adolescents meanwhile urban and rural female adolescents showed significant differences in the serving size of fruits ($p=0.002$), vegetables ($p=0.003$), sodium intakes ($p=0.001$) and HEI score ($p=0.008$). Majority of urban (91.5%) and rural (99.5%) adolescents had low diet quality. This study could provide useful information to Ministry of Health to develop programmes related to nutrition for school adolescents of urban and rural areas in order to improve their diet quality.

B27 Association between eating behaviours and weight status of picky eaters and non-picky eaters among Malaysian children aged 5 to 10 years old

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Picky eating behaviour is described with some typical response such as food selectivity, sensory-sensitivity and absence of curiosity in eating. Therefore, this cross-sectional study aims to compare the eating behaviours among the picky eaters and non-picky eaters in Malaysia. A total of 174 Malaysian parents of children ages 5 to 10 years old were recruited to the current study using a combination of purposive and snowball sampling methods. Parents were required to fill an online questionnaire hosted on google forms, which comprises of socio-demographic characteristics, perceived child weight and height and 35-items listed in the Children's Eating Behaviour Questionnaire (CEBQ). Data analysis was conducted using IBM SPSS version 26, wherein the mean difference was analysed with Student's T-test. Pearson's chi-squared was performed to investigate the association between socio-demographic characteristics, weight status and picky eating behaviours. Overall, the prevalence of picky eating behaviour was 53.4%. Picky eaters had significantly lower mean scores in food responsiveness (FR) (2.50±0.81) and enjoyment of food (EF) (2.91±0.90) compared to non-picky eaters (FR=2.76±0.82 and EF=3.85±0.73). However, no significant difference in the mean scores were observed in emotional overeating (EOE) and desire to drink (DD) subscales between picky eaters (EOE=2.20±0.75 and DD=3.02±0.92) and non-picky eaters (EOE=2.36±0.74 and DD=2.80±0.87). It is also worth highlighting that the picky eaters imposed significantly higher mean scores in satiety responsiveness (SR) (3.24±0.74), emotional undereating (3.20±0.84) and slowness in eating (SE) (3.30±0.93) subscales compared to non-picky eaters (SR=2.77±0.61, EUE=2.90±0.71 and SE=2.74±0.79). All in all, the picky eaters had a significantly lower mean score in food approach traits (2.62±0.68) but a significantly higher mean score in food avoidance traits (3.44±0.52) in contrast to non-picky eaters (food approach traits=2.94±0.59 and food avoidance traits=2.67±0.44, respectively). There was no association ($p>0.05$) found between sociodemographic characteristics and picky eating behaviour except for father's age (=8.04, p=0.03). Likewise, there was no association between picky eating behaviour and weight status of children (=1.02, p=0.80). On a final note, picky eaters have shown a stronger display of food avoidance than food approach which portrays their behaviour as a picky eater. Findings in the current study may be used to develop relevant interventions in future.

B28 Diet quality of Aboriginal children in Negeri Sembilan

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The prevalence of childhood malnutrition is becoming a serious health issue worldwide especially among minorities and evidence suggests intake levels of some food groups or nutrients as one of the key determinants. The objective of this study was to assess the diet quality of Aboriginal children in Negeri Sembilan. This cross-sectional study was conducted among 177 Aboriginal children (males=52%, females=48%, mean age=9.5 years old) from three Aboriginal primary schools in Negeri Sembilan. Three days 24-hours dietary recall was used to record the diet consumption and Malaysian Healthy Eating Index (MHEI) was used to assess the diet quality of the children. About 4.5%, 13.6% and 5.1% of Aboriginal children were underweight, stunted and thin, respectively. The prevalence of overweight and obesity among the Aboriginal children were 38% and 25%, respectively. The overall MHEI score showed that 89.3% of children had poor diet quality. The average serving size of cereals/grains (3.41±1.49), vegetables (0.61±0.84), fruits (0.41±0.74), legumes (0.04±0.17) and milk (0.17±0.40) were relatively lower than the recommended serving size for the children. There were significant positive correlation between diet quality and grains/cereals ($r=0.16$, $p=0.032$), vegetables ($r=0.493$, $p<0.001$), fruits ($r=0.317$, $p<0.001$), meat/poultry/eggs ($r=0.320$, $p<0.001$), fish/seafoods ($r=0.358$, $p<0.001$), and legumes/lentils

(r=0.305, p<0.001). Whereby, there was a significant negative correlation between diet quality and total percentage of energy intake from dietary fat (r=-0.449, p<0.001). Overall, the results showed that the Aboriginal children had poor food groups intake, and high total percentage of dietary fat intake inversely influence the diet quality of the aboriginal children. The poor intake of food groups, excessive fat intake and presence of malnutrition should be considered in planning future intervention for enhancing the health and well-being among Aboriginal children.

B29 Development of healthy menu at minimum cost for older adults in Selangor using Diet Optimization Model

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The number of older adults in developing countries is growing faster than in developed countries. The unbalanced diet practised by older adults may lead to malnutrition problems. Food cost is a significant obstacle in consuming nutritious foods. Therefore, to overcome this problem, we have utilised the Diet Optimization Model to produce healthy menus at minimal cost for older adults. This study used data obtained from phase IV of the LRGS-Towards Useful Ageing study (LRGS-TUA). This study involved 246 elderly aged 60 years recruited by purposive sampling from 10 areas in Selangor, Malaysia. Data on sociodemographic, anthropometry and nutrient intake were analysed. A healthy menu model for 1800kcal and 2000kcal was developed at minimal cost by using a Diet Optimization Model through Mathematical Programming. The results show a total of 38.6% of older adults are in the overweight category and 71.5% of the elderly in Selangor live below the National Poverty Line 2020 (PGK). Energy, fibre, thiamine, riboflavin, niacin, potassium and calcium intake for both men and women elderly did not meet the recommendation by RNI (2017). The optimization model successfully created two diet models that fit the lower limit (LL) and an upper limit (UL) of nutrient constraints from RNI 2017. The minimum expenditure for food purchases for the elderly in Selangor, which is RM8.00 for 1800kcal and RM8.69 for 2000kcal. This study has proven that the Diet Optimization Model can be applied to develop a minimum cost diet that would meet the nutritional needs that will help the older adults especially those in the poverty group to get healthy and nutritious food and enable them to undergo successful ageing.

B30 Validity and reliability of a short form food frequency questionnaire among university students in UniSZA

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Food frequency questionnaires (FFQs) are commonly used because of their low cost and ease of use. The main aim of the present study was to find the validity and reliability of the short form FFQ among university students in UniSZA. A 7-day 24-hour diet recall and long

form FFQ was used as a reference method in this crossover study, while short form FFQ was treated as test method. Validity and reliability were assessed by using paired t-tests, intra-class correlation coefficient (ICC) and Bland–Altman plots. A total of 89 students from UniSZA participated and completed this study. The results of this study shows that ICC values ranged from -0.20 to 0.32 for nutrients except for dietary fiber (ICC=0.83), ferum (ICC=0.70), and potassium (ICC=0.61) while food groups were ranged -0.12 to 0.28. Besides, the ICC values ranged from 0.41 to 0.37 for nutrients intake except niacin (ICC=0.83) and -0.22 to 0.16 for food groups. This indicated a poor validity for short form FFQ when compared to long form FFQ or when compared to 24-hour diet recall. However, short FFQ1 vs. short FFQ2 showed excellent reliability for both intakes which were excellently closed to 1. Bland-Altman plots showed good agreement across the range of intakes. The average energy difference between three methods was 244 kcal (upper LOA=1389 kcal; lower LOA=-1579 kcal). In conclusion, this Short FFQ has an acceptable validity and excellent reliability in assessing the food group and nutrient intakes among UniSZA students. Validation with biomarkers is necessary for the delivery of high-quality research data.

B31 Relationship between parental nutrition behaviour and children food habits and physical activities in Negeri Sembilan

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The surrounding domestic environment has an impact on children's food habits and on the development of their food behaviour. The study aims to study the relationship between parental nutrition behaviour and children's food habits and physical activities. A cross-sectional study was conducted among 146 aboriginal parents and children from aboriginal primary schools in Negeri Sembilan. A pre-tested self-administered questionnaire was used to assess parents and children's food habits as well as physical activities. SPSS version 23 was used to analyse the data. Only 21.2% of parents were aware of high calorie diets and most (78.8%) of parents received information from television and radio. More than 50% of the parents consuming unhealthy food at least once a week especially sweeten beverages such as carbonated drinks (69.2%) and high salted foods such as sauces (66.4%). High percentages of children consuming unhealthy food such as fast food (89.0%), sweeten beverages (88.4%), and sweets (89.7%). Only 17.8% of parents and 21.9% of children consume fruit every day. There are 33.6% of parents and 57.5% of children do not consume vegetables every day. About 13.7% of parents are engaged in physical activity every day. Percentages of children watching television and doing homework were highest among sedentary activities (72.6% and 60.3%). Parents' vegetables and fruit consumption showed a significant relationship with children's healthy food consumption ($r=0.292$, $p<0.001$) including fruits ($r=0.228$, $p=0.006$) and vegetables consumption ($r=0.453$, $p<0.001$). Parent's healthy food habits were significantly correlated to children's physical activity ($r=0.183$, $p=0.027$). Parents' unhealthy food habits directly correlated with unhealthy food habits of children ($r=0.293$, $p<0.001$). Parents and children have shown no significant relationship to physical activity. Promoting fruits and vegetables consumption among parents able to enhance children healthy food habits including fruits and vegetables consumption as well as physical activities.

B32 Assessment of food environment of public schools cafeteria in Kota Bharu, Kelantan: quantitative analysis approach

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Schools have been recognized as important food environment to cultivate and encourage healthy and balanced diet practices among school-aged children. The present study was aimed to assess the type and quality of food and beverages sold in primary and secondary school canteens from two main government-based type schools – National school *(Sekolah Kebangsaan)* and Chinese national-type school *(Sekolah Jenis Kebangsaan)* in Kota Bharu, Kelantan. A simple random sampling of 2:1 ratio were used to select all eligible schools from the list of all schools in the District of Kota Bharu, Kelantan. A total of 10 schools were included in the study, in which detailed information of all food and beverage items sold in the canteens were collected during school days. Classification of these food and beverage items were based on several approaches namely, main food groups derived from the Malaysian Food Pyramid Guideline and nutrient profiling based on the Traffic Light food system. A total of 635 food and beverage items were included, where secondary schools had higher food items sold than that of the primary schools (56% vs. 44%, respectively). In terms of contribution of main food groups in both schools, it showed that grains and cereal products were largest contributor of food group served (29-32%), followed by beverages (30-32%), confectionary and sweet foods (11-12%), snack and fast foods (10%), and animal-based foods (6-11%). On the contrary, vegetable and fruit group was the least sold food items (0-2%). Almost similar patterns of main food groups sold both in primary and secondary schools. When the nutrient profile of sugar content was based on the Traffic Light Labelling System showed that most pre-packaged foods, mainly from confectionary (18.3%) and pre-packaged beverages of flavoured milk and fruits drinks (9.6%) were exceeded the recommended sugar levels of >22.5g per 100g and >11.25ml per 100ml, respectively. Only very small of these pre-packaged food and beverages (8.7%) were classified as healthier food choice. These findings indicate that unhealthy food items are still being sold largely in the school canteens. Hence, interventions such as sustainable healthy school canteen menus should be highly needed to promote healthy food eating of school-aged children in schools.

B33 Factors associated with mindful eating among undergraduate students in Universiti Putra Malaysia

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Mindful eating is characterised as being conscious of our eating habits and involves paying full attention to the experience of eating and drinking. Examples of mindful eating include sitting at a dining table when eating, chewing more slowly, eating away from distractions such as the TV, computer or smartphone, and no multitasking during mealtimes. There are little published data exploring mindful eating in university setting, where university students are always claimed as having busy schedule. Therefore, this cross-sectional study aims to determine factors associated with mindful eating among undergraduate students in Universiti Putra Malaysia. This study included 276 respondents (25.7% males and 74.3% females) with a mean age of 20.61±1.28 years old from three randomly selected faculties. Respondents completed an online survey comprising socio-demographic characteristics,

mindful eating, physical activity, eating behaviours, depression, anxiety, stress, body appreciation and self-compassion. Body weight, height, waist circumference and body fat percentage were measured by researcher. Results showed that mean score of mindful eating was 2.68±0.23, ranging from 1.90 to 3.21, with no sex differences ($p>0.05$). One in ten of the respondents (12.0%) were underweight, 19.1% were overweight and 11.6% were obese. One in five (19.6%) had abdominal obesity and 39.7% had high body fat percentage. Uncontrolled eating ($r=-0.318$, $p<0.001$), emotional eating ($r=-0.295$, $p<0.001$), depression ($r=-0.153$, $p=0.011$), stress ($r=-0.126$, $p=0.036$), body appreciation ($r=0.147$, $p=0.015$) and self-compassion ($r=0.195$, $p=0.001$) were significantly correlated with mindful eating score. Multiple linear regression results further showed that emotional ($\beta=-0.423$, $p=0.047$) and uncontrolled eating ($\beta=-0.318$, $p=0.004$) were negatively predicted mindful eating score, which accounted for 11.8% of the variance in mindful eating. In conclusion, health promotion programs should promote mindful eating as one of the healthy eating practices among undergraduate students.

B34 Assessing validity of MY Food Album™ as a food portion size estimation kit in dietary assessment among adults

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Food portion size estimation can be improved by using a food portion size album during dietary assessment. MY Food Album is a photographic portion size album which was developed by Wong (2019) and contained 393 food items categorised into 14 food groups. The objective of this study was to determine the validity of MY Food Album in aiding portion size estimation of food displayed and food consumed in the previous day. A total of 55 adults (17 males, 38 females) aged 26.6±8.1 years participated in this validation study. During phase I validation, each participant estimated two portion sizes of 10 displayed food items by selecting pictures in the MY Food Album that had the closest resemblence in portion size with the displayed foods. They were then served *ad-libitum* a nasi lemak lunch menu consisted of 10 items. All self-served food items were weighed and recorded by researchers. On the following day (phase II validation), assisted by the MY Food Album, participants recalled portion sizes of lunch meal that they consumed on the previous day. The results showed that 71% to 100% of participants chose the "correct" or "adjacent" pictures for the 20 displayed food items. A total of 16 (80%) out of the 20 food items displayed were estimated to be equal or nearly equal to the actual food quantities. The estimated and actual food weights were highly correlated, ranging from $r=0.64$ to 0.89 ($p<0.001$), except for rendang ayam ($r=0.89$, $p<0.05$). Bland-Altman plots showed that 80% of food items from the lunch menu set had narrow average bias of estimation. Based on the results, it was concluded that MY Food Album was reliable in aiding portion size esimation of food displayed and food consumed on the previous day during diet recall sessions.

B35 SEANUTS II Malaysia: Strategies to overcome the challenges of dietary analysis in a children's nutrition survey

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The precision of processing and analysing dietary data has an impact on the accuracy of nutrient data estimation. This process is challenging yet seldom reported. Therefore, this presentation aims to share the strategies used to overcome challenges of dietary data analysis in a children's nutrition survey, namely the South East Asian Nutrition Surveys II (SEANUTS II). Malaysia is one of four countries involved in this multicentre survey, which aims to assess the nutritional status, dietary intakes and lifestyle behaviours of children aged 6 months to 12 years. The study employed interview-administered, multiple-pass 24-hour dietary recalls to assess dietary intake of children. The 1997 Malaysian Food Composition Database (MyFCD 1997) is the main food composition database used for nutrient analysis. During the dietary analysis process, issues encountered include but are not limited to: (1) poor or unspecific description of the recorded food/beverage items; (2) poor matching of MyFCD 1997 with the food/beverages reported; (3) new commercial or reformulated/enriched/fortified food not available in the database; and (4) limited coverage of nutrient values (i.e. vitamin D and vitamin B12 not available) in MyFCD 1997. Consequently, to meet the primary strategy to achieving the most appropriate food matching, a SEANUTS food composition database was compiled. With MyFCD 1997 as the primary food composition database; the exercise: (1) imputed incomplete nutrients from other databases (i.e. UK, USDA, Singapore and relevant local publications); (2) added new commercial food products (i.e. food nutrient labels, generic food items) in the reference database; and (3) created additional recipes for commonly-reported cooked dishes. Furthermore, other measures taken in the analysis include the use of standard portion sizes and a standard food matching list to replace foods unavailable in the database, inclusion of nutrient retention and yield factors in mixed-method recipe calculation, as well as adjusting for water and protein content differences in the imputation of missing nutrient values. It is envisioned that employing these strategies will improve the precision of nutrient estimation from dietary recalls and provide a more accurate interpretation on the health outcomes associated with dietary intake.

B36 Satiety scores and subsequent food intake of selected breakfast cereals in Universiti Kebangsaan Malaysia

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This study was conducted to determine the satiety scores and subsequent food intake of selected breakfast cereals. The Three Factor Eating Questionnaire (TFEQ) and several selection criteria were used to screen and select 30 subjects for the satiety test and subsequent food intake. The TFEQ was used to screen subjects with normal eating habits. Subjects were served with breakfast cereal and milk containing 50g of available carbohydrate. Subjects assessed their perception of fullness or hunger by marking on the labelled magnitude satiety scales every 15 minutes and 30 minutes for three hours. The 8 samples chosen from 15 breakfast cereals were *Koko Krunch*, *Milo*, *Cornflakes*, *Fitnesse*, *Goldflakes*, *Froot Loops*, *Honey Oats* and *Cheerios*. Meanwhile, *Kellogg's Special K Original* was used as reference. At 0 minute, no significant different ($p>0.05$) was detected between the reference and breakfast cereals. At 15 minutes, all samples reach their optimum value and decrease slightly against time till 180 minutes. Area under the curve (AUC) was calculated for the satiety scores of the breakfast cereals. T-test analysis showed significant difference ($p<0.05$) of subsequent macronutrient intake for reference sample, *Kellogg's Special K Original* and study samples, *Gold Flakes*, *Koko Krunch*, *Honey Oats*, *Corn Flakes* and *Cheerios*. But no significant different ($p>0.05$) for study samples *Milo*, *Fitnesse* and *Froot Loops*. To conclude, all the breakfast cereals have different satiating capacity which gives varied subsequent food intake values for certain breakfast cereal.

Group C: Nutrients & Other Components in Foods/Products

C01 Nutrigenomic on palm phytonutrients

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Nutritional genomics, or known as nutrigenomics, is the dietary effects on genome expression, such as protein expression, transcriptomics and metabolomics. Palm oil (*Elaeis guineensis*) has plenty of nutritional values that actually benefit its consumers. This oil is widely used in food production, not just as cooking oil, but other applications such as margarine, shortening, vanaspati, bakery fats, flour confectionery, pastries, instant noodles and so on. This study was done to review published articles on the effects of palm phytonutrients in genetic modulations. Recent studies have shown that palm oil phenolic-enriched fraction and tocotrienols have effects in the apoptosis mechanism in cells. Tocotrienol-rich fraction (TRF) and α-tocopherol (ATF) were found to have the ability to protect myoblasts from replicative senescence. On the other hand, palm fruit juice was able to prevent type 2 diabetes mellitus (T2DM) induction, while oil palm phenolics and TRF were shown to slower the migration and metastasis process in cancer and tumour progression. The genes that were discovered through all these pathways, might be able to be used as biomarkers in future studies that can enhanced or improved the quality of life. We have found that nutrigenomics approaches in palm oil and its phytonutrient research have not been widely explored. Hence, more studies need to be conducted to conclude how palm oil and its bioactive compounds turn on or off certain genes that impact important metabolic and physiologic process in the body.

C02 Effect of soaking and boiling on the proximate composition and anti-nutrient content (tannin) of little millet (*panicum sumantrense*) and barnyard millet (*echinochloa frumaentacea*)

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Millets are a group of small seeded grasses that contains significant amount of nutrients with high dietary fibre content. It can be introduced in Malaysian diet for weight management and healthy people to adopt healthy eating. However, the presence of anti-nutrient (tannin) in millet reduces the bioavailability of minerals and protein digestibility. Several preparation methods such as soaking and boiling may affect the nutrient and anti-nutrients in millet. Therefore, this study was aim to determine the effect of soaking and boiling on the proximate composition and anti-nutrient content (tannin) of little and barnyard millet. Raw, soaked (soaking for 24 hours) and boiled millets (boiling for 25 minutes) were analysed and AOAC method was used to determine proximate composition while tannin was determined using Folin-Ciocalteu assay. The data of study was analysed using one-way ANOVA. The results of both soaked and boiled little and barnyard millets showed that moisture content ranged between 11.24%–72.48%, the ash content ranged between 0.26%-1.63%, the fat content ranged between 4.40%-5.52%, the protein content ranged between 6.32%-10.73%, the total dietary fibre content ranged between 8.42%-10.91%, available carbohydrate and total tannin content ranged between 2.64%-67.28% and 1.34%-3.91% respectively. From the finding, boiling significantly increased the moisture and total dietary

fibre content of both millets and significantly reduced the ash, available carbohydrate and total tannin content of barnyard millet ($p<0.05$). Meanwhile soaking significantly increased the moisture and protein in both millet and increased fat content was seen in little millet ($p<0.05$). However, soaking does not significantly reduced the total tannin content in millet ($p>0.05$). To conclude, boiling is the best method to prepare millet for consumption as it significantly increased total dietary fibre and reduced total tannin content in millet and this could potentially be beneficial in reducing body weight and obesity incidence.

C03 Sugar profile of Malaysian multifloral and monofloral Kelulut honey in comparison with Apis bee honey

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Kelulut (stingless bee) honey and the Apis bee honey exhibit different physicochemical characteristics. Hence, physicochemical parameters for Apis bee honey cannot be applied to kelulut honey. Previously Kelulut honey was not specified in neither the Food Act 1985 nor the Codex 2001 due to lack of reliable data. However, in 2017 a standard document on Kelulut Honey Specification (MS2683) which included sugar content was published based on analysis on multifloral Kelulut honey samples from various locations in Malaysia. The objective of this study was to establish whether monofloral Kelulut honey could conform to the sugar specification set out in the MS2683. This study involved two monofloral Kelulut honey (named after its nectar source) which are the acacia and coconut Kelulut honey as well as multifloral Kelulut honey. The Acacia Kelulut honey has a unique sweet taste while other Kelulut honeys are sour. Quantitative analysis was carried out using high performance liquid chromatography with evaporative light scattering detector (HPLC-ELSD) while qualitative analysis was carried out using electrospray ionization mass spectrometer (ESI-MS). The ESI-MS data was important to ensure a proper identification of the sugar since HPLC-ELSD data based on retention time could lead to misidentification. Recently it was discovered that trehalulose is one of the major sugar components in Kelulut honey and may have been previously mistaken for maltose since the retention times of trehalulose and maltose are close to each other. Mass fragmentation pattern for both sugars are reported here. The results have shown that sugar content of Acacia Kelulut honey is significantly higher than coconut Kelulut honey and multifloral Kelulut honey. Despite the high content, the parameter still conform to the MS2683 specification.

C04 Determination of mineral and vitamin C contents in *amaranthus dubius* (red spinach), *spinacia oleracea* (green spinach) and *alternanthera sissoo* (Brazilian spinach)

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Throughout the world, there are many types of vegetables found with tremendous beneficial effect for mankind. Sufficient consumption of vegetables can help prevent major diseases such as cardiovascular disease, certain cancer and non-communicable diseases. Thus, this study was conducted to determine the mineral and vitamin C contents in three types of spinach of *Amaranthus dubius* (red spinach), *Spinacia oleracea* (green spinach) and *Alternanthera sissoo* (Brazilian spinach). The mineral content of the three types of spinach were determined through atomic absorption spectrometry (AAS), while for vitamin C, it was

carried out with high performance liquid chromatography (HPLC). The *Amaranthus dubius* (red spinach) had the highest concentration of calcium, copper and iron (392.450±34.330 mg/g, 0.331±0.131 mg/g and 2.662±0.992 mg/g), whereas *Spinacia oleracea* (green spinach) possessed the highest magnesium and potassium content (143.833±0.225 mg/g and 134.915±4.487 mg/g). As for *Alternanthera sissoo* (Brazilian spinach), it had the highest zinc content (2.393±1.415 mg/g) among the three types of spinach. The content of vitamin C was found highest in spinach of *Spinacia oleracea* (green spinach) with 56.333±0.503 mg/g. Thus, the study had discovered that the *Amaranthus Dubius* (red spinach) had high mineral content compare to *Spinacia oleracea* (green spinach) and Alternanthera sissoo (Brazilian spinach). As for vitamin C content, *Spinacia oleracea* (green spinach) had the highest vitamin C content within the three types of spinach.

C05 Survey on salt content through food labels of savoury snack products

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Snack is one of the food products in the market that have high salt content. Excess salt consumption is associated with elevated blood pressure and risk of cardiovascular diseases. Thus, this study aimed to identify salt content in labelling of savoury snack products in the market and to determine percentage of savoury snack products that exceed the sodium reference value of International Product Criteria. A cross-sectional survey of savoury snack products (n=563) was conducted in Kuala Lumpur market. The snack products in this study were classified into five groups (tuber-based; grain and starch-based; nut-based; seafood-based; seaweed-based). The salt content (%) was collected from information panel of the product. Sodium content of the products was also compared to sodium reference value of International Product Criteria 2016. The product group with the highest salt content was seafood-based savoury snack products (2.7%) followed by seaweed-based savoury snack products (2.4%), grain and starch-based savoury snack products (1.8%), tuber-based savoury snack products (1.4%) and nut-based savoury snack products (1.1%). All seaweed-based savoury snack products had sodium content above the reference value of International Product Criteria followed by seafood-based products (92.9%), tuber-based products (85.0%), grain and starch-based products (80.3%) and nut-based products (38.8%). Findings of this study indicated that salt content of savoury snack products was high with more than 60% products could be considered as high salt food according to Malaysia Dietary Guidelines. Engagement with food industries should be initiated in order to encourage product reformulation that will enable salt reduction targets to be met.

C06 Determination of mineral content of little millet (*panicum sumantrense*) and barnyard millet (*echinochloa frumaentacea*)

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Millet is a type of whole grain belonging to the family Poaceae. Millet can be categorised into two types; major and minor millets. In this study, two types of minor millets, namely little and barnyard millet are analysed for its mineral content. Little and barnyard millet

are notable for its' high source of potassium and phosphorus. Being a whole grain and having high potassium content, millet has the potential to be a healthier alternative for combatting diseases such as diabetes and obesity in Malaysia. This study aimed to determine the mineral contents of little millet and barnyard millet. The millets were chosen through purposive sampling. Eight minerals were analysed which are copper, zinc, sodium, potassium, magnesium, iron, calcium and phosphorus. They were analysed using atomic absorption spectrometry (AAS). The results showed that there was no significant difference of mineral content between little millet and barnyard millet. Both millets are abundant in potassium, phosphorus, magnesium and sodium, while lesser minerals found were copper, calcium, iron and zinc. There was a higher content of copper, phosphorus and potassium in little millet whereas for barnyard millet there was a higher content of sodium, magnesium, zinc, calcium and iron in barnyard millet. The differences in mineral content can be attributed to cultivars, soil pH and mineral, and type of reagents used. The high potassium content which averages at 77.72 mg/g in these millets proves that millet can be a potential healthy alternative for Malaysian consumption as potassium is inversely related to obesity, blood pressure and metabolic syndrome. Both millets are found to be nutritionally superior to white rice in all minerals except calcium. With further research, millet can be proved to be a potential healthy alternative in place of white rice for Malaysian consumption because of its nutritional advantage.

C07 Lycopene, total carotenoid and total flavonoid contents in lycopene-rich drink

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Dietary of carotenoids and flavonoids have gained attention among nutritionists due to the evidence of epidemiological studies that proving its preventive properties toward chronic diseases such as cancers, cardiovascular diseases (CVD), eye diseases and diabetes. Flavonoids are bioactive compounds found in food matrix of plant origin with antioxidant effects. Flavonoids are classified into subgroups based on their chemical structure; flavanones, flavones, flavonols, flavan-3-ols, anthocyanins and isoflavones. Carotenoids are colourful pigments and are made up of different phytochemicals commonly found in fruits and vegetables such as orange (β-carotene), yellowish-green (lutein), yellow (zeaxanthin), green (chlorophyll), blue-purple (anthocyanin), and red (lycopene). Lycopene is one of the most potent antioxidants which is naturally present in red coloured fruits and vegetables (papaya, watermelon, tomato and red pepper). Due to a growing demand for functional / health products, a lycopene-rich drink was developed from Malaysian watermelon to fulfil the recommendation of daily lycopene diet intake. This study was carried out to determine lycopene, total carotenoid and total flavonoid contents in the lycopene-rich drink using UV-vis spectrophotometer technique. Lycopene was extracted using hexane: ethanol: acetone (2:1:1) and measured at 503nm. Total carotenoid was extracted using ethyl acetate: dichloromethane: hexane (80:16:4), measured at 450 nm and calculated as mg/kg of β-carotene. Total flavonoid content was measured at 367 nm and calculated as mg quercetin/g of extract. This study showed the lycopene-rich drink contained 10.6 mg/200 mL of lycopene content, 19.4 mg/L of β-carotene and 5.4 mg quercetin/g of extract. The shelf life study was also carried out and showed the lycopene, total carotenoid and total flavonoid content was stable for 3 months of accelerated storage at 40°C.

C08 The chemical analysis of *Camellia* and non-*Camellia* teas

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This is an update on the black and white tea of *Camellia sinensis* and red tea of *Aspalathus linearis*. Both plants belong to different family which is Theaceae and Fabaceae, respectively. The historical utilization of these species are as a beverage. However, *A. linearis* was recognised as tea in recent times, when compared to *C. sinensis*, due to the lack of research. The red teas are also likely to be consumed nowadays since they are caffeine-free. The medicinal property of *C. sinensis* was reported as anti-oxidant and anti-bacteria. *A. linearis* extract is also published as anti-oxidant, anti-diabetic and anti-hypertensive. The research objectives are to study the pharmacological activities and the phytochemicals of the *Camellia* and *Aspalathus* species, based on literatures. It was also aimed to conduct organic extraction of *C. sinensis* and *A. linearis* and to detect the chemicals by using liquid chromatography. From the scientific articles, the constituents and biological activities of *C. sinensis* and *A. linearis* were mentioned. In the methodology, both black and white teas of *C. sinensis*, red tea from *A. linearis* and *Pandanus* tea were extracted. The qualitative analysis of the tea leaves extract was performed via the Thin Layer Chromatography. Natural compositions such as the alkaloid and flavonoid, for example, aspalathin, were expected to be isolated from the *A. linearis* tea leaves. In conclusion, extensive spectroscopic data is required to elucidate the structure of the constituents in the tea extracts. DNA barcoding would be an alternative technique to determine the safety of the non-*Camellia* teas.

C09 The phytochemical profiling of *Trigona* honey in Malaysia: a review

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Trigona honey, locally known as Kelulut honey, is a stingless bee honey that can be found in Malaysia. It has a lot attention due to its beneficial value where it may help in antimicrobial, anti-inflammatory and wound healing. The benefits of the stingless bee honey are very significant with the chemical compositions that are available in the honey. This study is conducted to review the articles regarding the phytochemical profiling of the stingless bee in Peninsular Malaysia. The study resulted in the inclusion of seven studies and two types of stingless bee species which are *Heterotrigona itama* and *Geniotrigona thoracica*. By categorizing the samples into four regions; North, East, West, and South, this study found that most of the stingless bee honey contain the phenolic compounds, the flavonoids and carbohydrate.

C10 Determination of total phenolic content, total flavonoid content and antioxidant activities by cold aqueous, ethanol and methanol extractions of barnyard millet (*echinochloa frumaentacea*)

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Millet is small-seeded whole grains that contain important source of fibre, vitamins, minerals, and phytochemicals. This study is to measure antioxidant contents and antioxidant activities of Barnyard millet with cold aqueous, 80% methanol and 70% ethanol. The aim of this study is to provide new findings on antioxidant content and activities in Barnyard millet that could be a potential source in reducing oxidative stress and can be potential source of antioxidant in food and pharmaceutical. The antioxidant content and antioxidant activities were determined by using total phenolic content (TPC), total flavonoid content (TFC), ferric reducing antioxidant power (FRAP) and DPPH radical scavenging method. One-way ANOVA and Pearson correlation were used in the study. Results showed that total phenolic content in Barnyard millet is the highest in cold aqueous extract which are 1638.976 mg GAE/g compared to other extracts. Meanwhile, for total flavonoid content, the result shows 675.440 mg CE/g in cold aqueous extract of Barnyard millet. The antioxidant activity using ferric reducing antioxidant power assay in cold aqueous was the highest value among other extracts in Barnyard millet which is 0.51 mmol ferrous/g. For radical scavenging activity, the highest value is in 80% methanol extract in Barnyard millet which is 12.627% compared to the other extracts. There is a significantly positive correlation of phenolic content and flavonoid content with ferric reducing antioxidant power assay in both samples but there are no positive significant results in both samples using DPPH radical scavenging activity. Variations of millet used, solvent extract used and different concentration use may affect the study. Different extract in different sample can be additional information on antioxidant content and antioxidant activity in cereal grains. This information could potentially be exploited in the future to extract antioxidant sources especially from millet that can be applied in our daily diet.

C11 Protective effects of bioactive substances extracted from red pitaya (*Hylocereus polyrhizus* cv. Jindu)

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This study aims to determine potential protective effects of red pitaya (*Hylocereus polyrhizus* cv. Jindu) obtained from Guangxi Autonomous Region in the People's of Republic of China. Pulps and peels of red pitaya were prepared and extracted with 80% methanol. The freeze-dried extracts were subjected to in vitro antioxidant and cell culture assays. Estimation of betacyanin content was done following the spectrophotometric method, whereas DPPH radical scavenging activity was determined using the 96-well plate method. 3T3-L1 and

RIN-5F cell lines were cultured and tested for cytotoxicity, antioxidative and lipid reducing effects. A commercial type of pitaya-based colourant was used for comparison. The results showed that methanolic extract of pitaya peel had the highest betacyanin content, followed by pulp extract and colourant. High betacyanin content contributed to high DPPH radical scavenging activity in the peel extract, but not in the pulp extract. The extracts and colourant did not improve the antioxidant status of 3T3-L1 cells as compared to betanin standard. The high polysaccharide content in the pitaya pulp reduced its antioxidant capacity. Cell viability rate of the H2O2-induced death of 3T3-L1 cells was concentration-dependent for the standards and colourant but not for the methanolic extracts. Higher extract concentrations had higher lipid reducing effect when measured using the Oil Red O method. Also, the methanolic extracts were less toxic to both 3T3-L1 and RIN-5F cells in comparison to colourant, betanin and cyanidin-3-glucoside.

C12 Determination of vitamin C content in breast milk and its relationship with maternal diet and psychological state

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The postpartum period is considered as a sensitive and critical phase for the lives of mothers and new-born babies. Despite the increased requirements during the lactation period, the nutritional intake of some breastfeeding mothers was below than the recommendation. Asian women tend to avoid fruits and vegetables, which particularly has higher vitamin C content during the postpartum period. Therefore, this study aims to determine the vitamin C content in breast milk and its relationship with maternal diet and psychological state among lactating mothers. A longitudinal observational study including data collection from randomized controlled trial (MOM study) involving 64 mothers with 38 breast milk samples. Vitamin C content in breast milk at three different time point and within a feed was determined using HPLC method. Mothers completed a self-administered questionnaire comprised sociodemographic characteristic, postpartum traditional practises, and maternal psychological state including stress, anxiety and depression. More than half of the mothers avoid taking seafood and egg but increase the intake of fish, vegetables, and fruits during the confinement period. The mean vitamin C levels in breast milk range from 1.49 to 7.00µg/ml, which is below than the average expected range for vitamin C (30.32-50.90µg/ml). There was no significant difference in vitamin C content across time-point and within a feed (p-values >0.05). No association was found between maternal diet and maternal psychological state and vitamin C levels in breast milk (p-values>0.05). Nevertheless, the overall psychological state of the mothers seems to have improved across time-points showing by the reduction of the score for stress, anxiety and depression across time-points. Vitamin C content in breast milk was highly variables, which could be due to the variability of daily dietary habits among the mothers. Thus, improving the dietary assessment using 24-Hour dietary recall or food record are recommended for future research.

C13 Effect of shaking on the content of calcium in selected calcium fortified milk

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Milk is an important source of calcium. To achieve daily calcium requirement, consumers may opt to consume calcium-fortified milk. Calcium has low solubility in water and must be in the form of salt (i.e. phosphate and carbonate) in order to be fortified. The objective of this study was to determine the calcium content in selected calcium-fortified milk. Based on products' list of ingredients, twenty samples with added tricalcium phosphate and calcium carbonate were purposively purchased at a hypermarket in Bangi, Selangor, comprising of seven animal- and thirteen plant-based milk. An aliquot of each sample was digested in microwave and analysed for calcium content with Atomic Absorption Spectrometry. Subsequently, the milk product was shaken using a belly dancer shaker and another aliquot was taken for the measurement of calcium. The calcium content was not significantly different ($p>0.05$) between calcium-fortified plant- and animal-based milk. Although the calcium content was higher after the milk products were shaken, the difference was not significant ($p>0.005$) compared to the calcium content before they were shaken, for most of the samples. Nevertheless, Brand D (full cream milk) and Brand T (almond milk) had significantly higher calcium content ($p<0.005$), after they were shaken and the differences were 10.4% and 93.9%, respectively. A lower calcium content in unshaken milk may be due to the sedimentation of added calcium in calcium-fortified milk. Without shaking the product prior use, the added calcium will remain as precipitate at the bottom of the packaging. Besides, plant-based milk contains inhibitory substances such as phytate and oxalate which can bind to calcium and form insoluble complexes. Hence, it is crucial for consumers to shake the products, especially the plant-based milk prior to consume in order to get the maximum amount of calcium stated in the label.

C14 Overripe banana as a functional ingredient in developing high dietary fibre and low glycaemic index cookie

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Demand for dietary fibre-enriched and low sugar bakery products is increasing rapidly due to current high incidence of Type 2 diabetes mellitus. Banana is one of the most consumed fruit which provides excellent nutritional health benefits. However, overripe banana (OB) is discarded due to its low quality and appearance. Despite its appearance, overripe banana exhibits rich sources of natural sweetener and dietary fibre (DF) which could potentially be used as a novel food ingredient to replace added sugar and wheat flour in bakery product. Thus, the present study aims to determine the nutritional properties, sensory acceptability and glycaemic index (GI) value of chocolate cookies formulated with overripe banana sweetener (OBS) as partial replacement (10, 15 and 20%) for table sugar and utilisation of overripe banana residue (OBR) as partial replacement (8%) for wheat flour. Nutritional composition and sensory acceptability of the cookies were analysed using AOAC methods and 7-point hedonic scaling method, respectively. *In Vivo* GI determined was according to FAO/WHO international recognised GI methodology. Results have shown that incorporation of OBR and OBS significantly ($p<0.05$) increased nutritional values of chocolate cookies. Chocolate cookies formulated with 8% OBR+20% OBS recorded the highest TDF (7.80%) and ash (1.47%) content. Sucrose content of chocolate cookies was reduced significantly with increasing level of OBS. Moreover, incorporation of OBS up to 15% produced higher scores in term of aroma, flavour and overall acceptance. Three formulations of chocolate cookies (Control, 8% OBR and 8% OBR+15% OBS) were selected for GI testing and recorded GI values of 63, 56 and 50, respectively. Overripe banana can be used as an alternative novel DF-rich and low-GI food ingredient, which could widely utilized in developing various OB-based functional food as well as to prevent unnecessary food waste.

C15 Mineral composition and dietary fibre of popularly consumed rice-based meals

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The present work was aimed to determine the mineral composition and total dietary fibre (TDF) of nine varieties of rice-based meals. The region that was involved in this study was central (Selangor) and all the samples were purchased randomly in one kilogram quantity from the stalls or restaurants within the region. Analyses were carried out for TDF and minerals (zinc, iron, copper, manganese, magnesium, calcium and potassium). TDF in the samples were determined by using enzymatic-gravimetric method (AOAC 985.29) while atomic absorption spectrometric (AAS) method was used to determine the mineral composition. One- way ANOVA test was used to statistically analyse the mean difference of the TDF and mineral composition among the samples. Based on the one-way ANOVA test, there was a statistically significant difference in mean TDF among three rice-only samples ($p<0.05$) while there was no significant difference detected among six complete set samples ($p>0.05$). Among the three rice-only samples, significant difference were found only in magnesium, calcium and iron content ($p<0.05$). Of the six complete set samples, the significant difference only detected in potassium content ($p<0.05$). These findings could be beneficial in raising public awareness and assisting them to choose the healthier choices of the varieties of rice-based meals.

C16 The prebiotic potential of kuini juice

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Prebiotic potential of Kuini (*Mangifera odorata)* juice was accessed through *in vivo* and *in vitro* approaches in this study. The ingredient of the juice is mainly Kuini pulp with some additional ingredients and was targeted to be high in fibre; which might possess prebiotic activity. Prebiotics are known to be the metabolites in probiotics growth. Hence, to determine the potential prebiotic properties of Kuini juice, its ability to increase the growth of probiotics was Iinvestigated. *In vivo* study was carried out by feeding the juice to rats for the duration of five weeks (7.33 ml/kg bw) to see the gut microbiome (targeting *Lactobacillus* species and *E.coli*/coliform) changes. Stool sampling was done after first week and subsequent week for four weeks. The result showed a non significant increased from week 1 to 4 in *Lactobacillus* growth, comparing to control. However, *E. coli* growth was significantly reduced. Meanwhile, in the *in vitro* study, six *Lactobacillus* strains that are generally recognised as probiotics were chosen. They were subjected to growth comparison with control media. Each inoculum was observed in 96 hours with 24 hours of interval. *In vitro* result showed that the Kuini juice yield a higher growth of all *Lactobacillus* strains comparing to control. During 96 hours of evaluation, it can be seen that the growth count of all six strains in both studied samples were significantly higher, and at sometime by up to 3 log cfu/ml compared to control media. Based on these findings, it can be suggested that Kuini juice might have prebiotic effect which is beneficial for health.

C17 Determination of carbohydrate composition in breast milk and its association with infant's growth and behaviour

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Breastfeeding is the gold standard of infant feeding, and it is very exclusive as its composition varies within a feed, diurnally and over lactation period. Carbohydrate is the major macronutrient found in breast milk, which comprises lactose and oligosaccharides, and has been suggested to be associated with infant health outcomes. Thus, this study aims to determine the breast milk carbohydrate composition and its association with infant's growth and behaviour. A longitudinal observational study involving 64 infant-mothers dyads was conducted in Klang-Valley. Home visits were done at 2, 4-6 and 8-12 weeks of infant's age. Infant's weight and height were measured, and body weight status was determined. Infant's appetite and behaviour were assessed using the Baby-Eating-Behaviour Questionnaire and 3-Day Infant Behaviour Diary, respectively. Breast milk was collected for fore- and hind-milk at all home visits. Total carbohydrate was determined using human milk analyzer, whereas lactose was determined using high-performance liquid chromatography. The mean weight-for-age and BMI-for-age at week 8-12 were -0.50±0.87 and -0.99±1.01, respectively, indicating a normal growth pattern. Breast milk contains an average of 7.08±0.31 g/dL and 7.15±0.20 g/dL for total carbohydrate and lactose, respectively, showing the expected levels based on literature. Carbohydrate composition was stable across different time-points and within feeding ($p>0.05$). Total milk carbohydrate was positively correlated with infant weight at week 8-12 ($r=0.314$, $p<0.05$), but no significant association was found for lactose per say. No association was found between carbohydrate composition and infant outcomes e.g. appetite, feeding and sleeping behaviour. In conclusion, total carbohydrate was associated with infant weight at later time point of the study, but no association was found with other variables. As milk contains various nutrient and bioactive factors, future research with larger sample size shall explore the potential roles of milk composition for infant's well-being.

C18 Polyphenols content and antioxidant activity of *Mangifera odorata*

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This study aimed to investigate the effect of different extraction solvents and determine the optimum solvent concentration (in the range of 0–100%) for the recovery of total phenolic content, total flavonoid content and antioxidant capacity of peel, pulp and seed kernel of *Mangifera odorata* fruit. The total phenolic (TPC) and total flavonoid content (TFC) were determined using Folin–Ciocalteu and aluminum chloride assays, respectively. The highest level of TPC was found in 60% and 80% (v/v) acetone for pulp and seed kernel while peel showed the highest TPC at the concentration of 80% (v/v) acetone. The optimum total flavonoid content was achieved at 100% (v/v) methanol for all fruit parts. Antioxidant activity was measured using ferric reducing antioxidant power assay, and the result showed the highest activity at 60% (v/v) ethanol for all parts of *M. odorata* fruit. The highest

scavenging activity was shown at 60% (v/v) acetone for pulp and seed kernel, respectively. Peel exhibited the highest scavenging activity at 40% acetone. It can be concluded that the recovery of phenolic compounds was dependent on the polarity of the chemical constituents in the different parts of fruit as well as the polarity of the solvent systems used. Seed kernel had the highest TPC, TFC and possessed excellent antioxidant capacity compared to peel and pulp of *M. odorata*. Therefore, the seed kernel can be incorporated into food products as a functional ingredient for the prevention of oxidative-stress related diseases.

C19 Evaluation of antioxidant activities and phytoconstituents in the crude oils of Pulasan and Salak by-products

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The underutilised fruits, Pulasan and Salak, are rich in phytoconstituents including phenolics, carotenoids and flavonoids. However, the by-products of these fruits (seed, peel, or rind) are often discarded as fruit wastes without additional beneficial functions. Therefore, this study aims to determine the antioxidant activities and phytoconstituent contents (total phenolic content, total flavonoid content, and total carotenoid content) in crude oils extracted from Pulasan and Salak by-products. Antioxidant activities were evaluated using Trolox Equivalent Antioxidant Capacity (TEAC) and 2,2-diphenyl-1-picrylhhydrazyl (DPPH) radical scavenging assays while the phytoconstituent contents were determined using spectrophotometric methods. Data was analysed using one-way ANOVA and Pearson's correlation coefficient test with IBM SPSS Version 26. Antioxidant activity as determined by TEAC ranged from 237.49±5.16 mg Trolox/g crude oil (Pulasan seed) to 12605.36±30.28 mg Trolox/g crude oil (Pulasan rind) while for DPPH assay was from 2.09±0.12% (Pulasan seed) to 49.83±0.11% (Salak seed). Total Phenolic Content (TPC) was in the range of 657.70±4.60 μg GAE/g crude oil (Salak seed) to 9674.36±48.19 μg GAE/g crude oil (Pulasan rind), Total Flavonoid Content (TFC) was in the range of 19.13±0.13 mg CE/g crude oil (Salak seed) to 175.38±0.51 mg CE/g crude oil (Pulasan rind) and Total Carotenoid Content (TCC) was in the range of 393.39±1.41 μg β-carotene/g crude oil (Salak seed) to 2809.56±11.26 μg β-carotene/g crude oil (Pulasan rind). Findings from Pearson's correlation coefficient test demonstrated that there were strong and positive correlations between TPC and TEAC (r=0.966), TFC and TEAC (r=0.993) as well as TCC and TEAC (r=0.998). Emerging results indicated that crude oils extracted from the by-products of underutilised fruits contain significant amount of phytoconstituents.

C20 Dietary fibre and proximate composition of MARDI rice varieties

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Rice is known as a staple food for Malaysian and main research priority under Malaysia Agricultural Research and Development Institute (MARDI). The development of new varieties of rice is one of the research targets for food security as well. In this paper, we provide a data about dietary fibre components and proximate composition of selected new MARDI

rice varieties. Eight varieties of polished rice with different characteristics were analysed for their proximate composition and dietary fibre contents using the Association of Official Analytical Chemists (AOAC) and well-validated methods. Firstly, selected varieties were harvested at 85% maturity period, dehulled, polished at 60 second and stored in air tight container at chilled temperature before analysed. Moisture contents of eight rice samples were found from 9.42% to 11.43%, respectively. Other than that, the proximate analysis of total carbohydrate, crude protein, total fat and total ash contents of rice samples were found from 79.26% to 81.99%, 6.87% to 8.54%, 0.13% to 0.46% and 0.29% to 0.47%, respectively. All rice samples had a considerable amount of total dietary fibre from 2.18% to 2.69%, soluble dietary fibre from 0.58% to 0.81% and insoluble dietary fibre from 1.09% to 1.94%, respectively in all varieties. All rice samples were found to have good nutritional values as well as commercial white rice and the data will be used as reference to up scaling the project.

C21 Determination of proximate and fatty acid compositions, chlorophyll and carotenoids contents of *Haematococcus pluvialis*

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Microalgae products are marketed as “super food” for its high nutritional values. Among the wide range of microalgae species, *Haematococcus pluvialis* is famous for its high carotenoids’ contents especially the astaxanthin. To date, there is limited study on nutritional compositions of *H. pluvialis* in different cultivation stages. Hence, this study aimed to determine the proximate and fatty acid compositions, chlorophyll and carotenoids contents of *H. pluvialis* at green and red cultivation stages. The determination of dry weight was performed using the drying oven method at 80°C for overnight. The extraction of lipids was done by ultrasound-assisted Folch method with 2:1:0.8 chloroform:methanol:water (V/V/V) and the fatty acid compositions were analysed by gas chromatography with flame-ionization detector (GC-FID). The protein content was estimated using BCA test kit with bovine serum albumin (BSA) as standard. Chlorophyll and carotenoids contents were extracted by 100% acetone with ultra-sonication treatment and calculated using Lichtethaler’s formula. The carotenoid compositions were determined using thin layer chromatography (TLC) with hexane-acetone (7.5:2.5, V/V) as solvent. The results showed that higher contents of protein (0.055±0.008 µg/mg, DW) and chlorophyll (0.232±0.069 µg/mg, DW) were obtained from green *H. pluvialis* ($p<0.05$). Both protein (0.030±0.003 µg/mg, DW) and chlorophyll (0.031±0.006 µg/mg, DW) contents decreased drastically in red cultivation stage due to the enhanced carotenogensis of astaxanthin. Higher carotenoids (0.075±0.006 µg/mg, DW) and lipids contents (64.62±0.12%, W/DW) were obtained from red *H. pluvialis* ($p<0.05$). Besides that, both green and red *H. pluvialis* produced high amount of oleic acid (35%, W/W), the red *H. pluvialis* consisted higher linoleic acid (12.5%, W/W). In conclusion, the findings revealed that green *H. pluvialis* was significantly higher in protein and chlorophyll contents, whereas, higher lipids and carotenoids contents were found in red *H. pluvialis*. Green *H. pluvialis* has higher saturated fatty acids (SFAs), and red *H. pluvialis* contained higher polyunsaturated fatty acids (PUFAs). Both green and red *H. pluvialis* possess high nutritional values with potential for applications in functional foods and supplements industries.

C22 Survey on salt content in food products of fast food restaurants in Klang Valley

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Malaysians are exposed to high salt diet which is one of the contributors to the prevalence of hypertension among them. According to the ninth message in Malaysian Dietary Guidelines (MDG 2010), reducing the consumption of fast food can lower down the salt intake in diet. Hence, this study aimed to identify the salt content in food products of fast food restaurants that are available in Klang Valley. The salt content data were collected through online survey of the official website of the chosen restaurants (Kentucky Fried Chicken and McDonald's). As for Subway® and Texas Chicken restaurants, the information was obtained by communication through email. The food products were then classified into eight food categories (chicken-based, potato-based, rice-based, sandwich, salad, bread, dessert and sauce). The salt content was analysed using the SPSS software version 25.0. From a total of 105 food products that were involved in this study, sauce product category contained the highest salt content (1.86±0.79%), followed by bread (1.17±0.28%), potato-based (1.15±0.38%), chicken-based (1.15±0.33%), sandwich (1.07±0.63 %), rice-based (0.66±0.26%), salad (0.37±0.18%) and dessert (0.25±0.37%). Salt content in sauce product category was also significantly ($p<0.05$) higher compared to sandwich, dessert, salad and rice-based category. Meanwhile, all potato-based products contained salt content that significantly ($p<0.05$) exceeded the reference value stated by the International Product Criteria (IPC 2016). This was followed by bread (66.7%), rice-based (60%), sauce (50%), sandwich (36.6%), salad (30.8%) and dessert (6.7%). The study showed that most products of fast food restaurants, especially sauces are high in salt. Since sauces are often served to compliment a particular dish, product reformulation and strategic interventions aim to reduce fast food and sauces intake should be conducted.

Group D: Clinical Nutrition/Intervention Trials

D01 Associations between sociodemographic, clinical factors, nutritional status, dietary intakes and bone quality with serum phosphate level among hemodialysis patients

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Hyperphosphatemia is a main cause of morbidity and mortality in chronic kidney disease patients, however data is scarce at the local context. This cross-sectional study aimed to determine the associations between sociodemographic factors, clinical factors, nutritional status, dietary intake and bone quality with serum phosphate level among hemodialysis (HD) patients. Structured questionnaire was used to obtain information on sociodemographic and clinical factors while two-day dietary data was obtained on dialysis day (using food record) and non-dialysis day (using diet recall), respectively. Bone quality of patients was determined using Quantitative ultrasound measurement on the radial part of non-dialysis arm. Serum phosphate was retrieved from medical records as secondary data. Statistical Package for Social Sciences (SPSS) version 24 was used in data analysis,

with significant level set at p<0.05. A total of 99 patients was recruited with mean age of 56 years old. Prevalence of hyperphosphatemia was high at 80%. About half of the patients were either overweight or obese. Dietary protein intake was unsatisfactory with almost one in nine fell short of protein intake while 20% had excessive dietary phosphorus intake. Despite approximately three-quarter of the patients claimed themselves complied with phosphate binder prescription, this result should be interpreted cautiously in view of the high prevalence of hyperphosphatemia and excessive dietary phosphorus intake among them. Approximately half of the patients had low bone quality. Serum phosphate level was correlated negatively with age (r=-0.365, p<0.001) but associated positively with educational level (r=15.725, p<0.001) and compliance to phosphate binder (r=5.929, p=0.021). Hyperphosphatemia remains an unsolved clinical issue among HD patients, which deserve attentions from relevant authorities. Higher serum phosphate level among younger patients and educated patients signify the attention of healthcare professional including dietitians to be sensitive with the serum phosphate compliance of young and or educated patients.

D02 Effect of vitamin c supplementation on lipid profiling and oxidative stress in type 2 diabetic patients: a randomised placebo-controlled trial study

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Vitamin C is one of the most important antioxidants that inhibits lipid peroxidation and improves endothelial function. Diabetic dyslipidemia is the cause of oxidative stress-induced vascular damage along with the simultaneous decline of antioxidant defense system leading to cellular damage, increased lipid peroxidation and subsequent development of severe complications in type 2 diabetes mellitus (DM). Antioxidant vitamin C has been reported to reduce oxidative stress by arresting free radical damage and thereby improves lipid levels in type 2 DM patients. The present study was aimed to investigate the impact of oral vitamin C supplementation with metformin on lipids and oxidative stress biomarkers in patients suffering from type 2 DM. Sixty patients with type 2 DM were divided randomly into placebo and vitamin C group. The patients were randomly divided into two groups: Group I (study group, n=30) received intravenous 250 mg of vitamin C supplementation and Group II (control, n=30) received placebo (intravenous saline) twice daily for 12 weeks. The study will be approved by the Ethics Committee of Faculty of Medicine, UST University, and all patients will be gave written informed consent to participate in this study. This prospective study will be performed in the Internal Medicine Unit at the UST University Hospital, during the period from January 2021 to August 2021. Sixty diabetic patients on anti-diabetic therapy will be enrolled in this study. The treatment, diet and physical activity of the patients remained unchanged during the course of study. All patients will be subjected to full history taking, thorough clinical examination and laboratory investigations. Laboratory investigations include serum MDA, oxidized low-density lipoprotein, CRP, prostaglandins, plasma ascorbic acid, serum triglyceride, total serum cholesterol, high-density lipoprotein (HDL), and LDL.

D03 Colonic fermentation of isomaltulose in healthy Malaysian adults: a single-blind, randomised, crossover pilot trial

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Isomaltulose (IM), a low glycaemic index sweetener is slowly hydrolysed in the body. Thus, its potential prebiotic effect due to the possible colonic spill-over remains unknown. The present study evaluated the dose-dependent colonic fermentation of 50 g of IM vs 50 g of sucrose (negative control) and the co-ingestion of IM and sucrose (25 g: 25 g) (IM+S) which were compared to a recommended 5 g dose of a known prebiotic inulin in single bolus administrations (dissolved in 250-ml of water). Fourteen healthy Malaysians (9 males, 5 females) aged 20-27 years administered test solutions randomly after an overnight fasting. Tests were separated by ≥3 days. Serial measurements (0th, 60th, 120th, 180th and 210th minutes) of breath hydrogen (BH) in expired air (ppm) were measured for 3.5 hours. Pre (48 hours before visit) and post-test (24 hours after visit) faecal samples were collected and pH-analysed. Inulin has the highest incremental area under the BH response curve (iAUC-BH) (1730.97±457.40 ppm*min) indicating colonic fermentation. However, it was not significantly different from IM (1220.18±565.13 ppm*min, p=0.145) but was significantly higher than sucrose (33.57±23.46 ppm*min, p<0.001) and IM+S (45.89±22.13 ppm*min, p=0.001). iAUC-BH of IM did not significantly differ from sucrose, IM+S or inulin. Faecal pH was significantly reduced post-IM administration (pre: 7.41±0.41 vs post: 6.80±0.79; p=0.016). Accordingly, changes in faecal pH post-IM (-0.60±0.69) and sucrose (0.26±0.72) boluses were significantly different (p=0.017). A 50 g single IM oral bolus administration resulted in a BH response statistically similar to inulin and significantly reduced faecal pH, indicating colonic fermentation. 25 g of IM (co-ingested with 25 g sucrose) did not show these results. Thus IM may increase colonic fermentation at single doses of ≥50 g rendering potential prebiotic effect.

D04 Effects of interesterified margarine rich in palmitic (IEPalm) and stearic (IEStear) on inflammatory markers in healthy adults: a parallel human study

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Trans fatty acids (TFAs) are well documented on its adverse effects on health. Interesterification has been used as an alternative process to harden edible oils instead of partial hydrogenation. In recent years, wide use of interesterified fat in food industries has generated research interests to investigate its effects on health. To date, there is no study reporting the effect of interesterified fat consumption on inflammatory markers. We therefore aimed to study the effects of interesterified fats rich in palmitic (IEPalm) or stearic

(IEStear) acid, in comparison with native palm margarine (NatPO) on inflammatory markers in 90 healthy human subjects. In this 8-week parallel, double-blind clinical feeding trial, 50 g of test fats in the form of margarine were incorporated into test snacks for consumption during breakfast and afternoon tea. A low fat background diet was also provided together with test snack. Compared to NatPO-diet, the IEPalm- and IEStear-diets possess similar effects on the inflammatory markers tested, namely high-sensitivity C-reactive protein (hs-CRP), interleukin-6 (IL-6), tumour necrosis factor-alpha (TNF-α) and visfatin. The findings suggested that the effects of these three test fats on CVD risk profile or metabolic syndrome, if any, is not mediated through the inflammatory pathway. However, further studies are warranted for health effects of a longer period of interesterified fat consumption.

D05 Maternal factors, social support and breastfeeding practice in relation to psychological state among mothers of hospitalised infants

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Maternal psychological distress during the postpartum period could pose a detrimental impact to both mother and infant's wellbeing, which may adversely affect mother-infant relationship. This cross-sectional study aims to determine factors associated with maternal psychological state during the postpartum period. Mothers of hospitalised infants (n=219) were recruited from hospitals in Putrajaya and Kuala Lumpur from January to March 2020. Maternal factors (sociodemographic and obstetric characteristic), social support such as self-efficacy and traditional postpartum care, and breastfeeding practice were assessed using self-administered questionnaires. Maternal psychological state was assessed for stress, anxiety and depression using validated questionnaires. The prevalence of mothers at risk of postpartum depression was 24.2%. Moreover, 65.8% of mothers had moderate level of stress and 74.9% had mild to moderate level of anxiety. Maternal factors found to be negatively correlated with maternal psychological distress were mother's age ($r=-0.138$, $p=0.042$) and number of children ($r=-0.185$, $p=0.006$). Social support ($r=-0.263$, $p<0.001$), breastfeeding self-efficacy ($r=-0.386$, $p<0.001$) and certain aspect of traditional postpartum care ($\chi^2=10.995$, $p=0.004$) were found to be negatively associated with maternal psychological distress. In terms of breastfeeding practice, initiation ($r=0.178$, $p=0.008$), pain ($r=0.366$, $p<0.05$) and problems ($r=0.303$, $p<0.001$) were positively correlated with maternal psychological distress while satisfaction was negatively correlated with maternal psychological distress ($r=-0.235$, $p<0.001$). This indicates that poor breastfeeding experience such as pain and lack of support could affect maternal psychological state. In conclusion, multiple modifiable factors such as social support, breastfeeding self-efficacy and satisfaction were negatively associated with maternal psychological distress while breastfeeding pain and problems were positively associated with maternal psychological distress. Thus, future studies should investigate these factors more extensively in order to establish a causal relationship. Maternal psychological health should be taken into account as part of postpartum care to ensure a better wellbeing for mothers and infants.

D06 Patient-related factors and adherence to antiretroviral therapy among HIV patients in Ahmadu Bello University Teaching Hospital Zaria Nigeria

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A patient's adherence behavior is a very critical link between the prescribed adherence to antiretroviral therapy regimen and treatment outcome. Factors such as depression, non-disclosure of HIV status, food insecurity, alcohol/substance abuse has been showed to be barriers to antiretroviral (ARV) medication adherence. A cross sectional study was conducted at Ahmadu Bello University Teaching Hospital Zaria Kaduna State, Nigeria. Simple random sampling method has been used to select the patients and self-administered questionnaires on demographic, food security, diet diversity, depression, alcohol and adherence to ART was completed by the patients. Multiple logistic regression analysis was used to assess the degree of association between dependent (ART) and independent variables. Overall, 385 respondents were involved, in which (67.5%) were female and (32.5%) were male. Most of the respondents (46.0%) were aged 41-50 years old and (54.8%) were Hausa ethnicity and (44.9%) of the respondents went to tertiary level of education. More than half of the respondents (52.5%) were within the normal BMI classification and 40.3% were over-weight. Majority of the respondents (87.0%) displayed food insecurity. Majority of the respondents (74.8%) displayed high diet diversity, 86.2% were depressed 87.3% have low intake of alcohol. About 5.2% and 7.0% of the respondents were on marijuana and cocaine drug, respectively. Results showed that (54.0%) respondents were adherence to antiretroviral (ARV) medication. Age (χ^2=11.659 p<0.01), occupation (χ^2=16.049 p<0.01), marital status (χ^2=8.652 p<0.05), diet diversity (χ^2=10.255 p<0.01) were significantly associated with adherence to ART. Multiple logistic regression revealed that respondents who educational level were primary school has lower odds to be non-adherence to ART (AOR=0.448, 95% CI: 0.244, 0.820) and respondents who were married has lower odds to non-adherence to ART than those single or divorced (AOR=0.469, 95% CI: 0.242, 0.909) while respondents who had poor diet diversity were more likely to be non-adherence to ART (AOR=1.815, 95% CI: 1.006, 3.275). In conclusion, this study unveiled that poor diet diversity, marital status and poor educational level contributes to poor adherence to ART. Therefore, the capacity to effectively manage the above critical factors is of great importance in the success of antiretroviral therapy.

D07 Prevalence of undiagnosed hypertension and its associated factors among the university staff

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Hypertension is a public health concern that is associated with heart disease. This study aims to investigate the prevalence of undiagnosed hypertension and its associated factors among the university staff. A cross-sectional study was carried out and 100 respondents participated in this study. Blood pressure, Body Mass Index (BMI), percentage body fat (%BF),

visceral fat rating (VFR), and waist circumference (WC) were measured. Questionnaires were administered to collect demographic data, knowledge, attitude, and practice (KAP) of salt diet, and their sodium intake. Statistical data was analysed using SPSS. The prevalence of undiagnosed hypertension was 24%. About 66% of the participants had excessive sodium intake and the estimated mean sodium intake was 2869.43±930.75 mg/d. Simple linear regression showed that BMI (r=0.628, p<0.001), %BF (r=0.341, p=0.001), VFR (r=0.627, p<0.001), and WC (r=0.545, p<0.001) were significantly correlated with systolic blood pressure (SBP). Age (r=0.183, p=0.068) and dietary sodium (r=-0.166, p=0.099) were not correlated with SBP. After controlling all the variables in multiple linear regression, VFR remained as a significant contributor to SBP (adjusted R^2=0.419, F=18.833, p=<0.001). Soy sauce, omelette, fried rice, and nasi lemak contributed to the highest sodium consumption. Those who consumed high dietary sodium were unaware of the negative impacts of high salt diet on their health. Our study found a high prevalence of undiagnosed hypertension. The mean sodium intake is higher than the recommended level. The association between VFR and SBP is an important finding for community study.

Group E: Food Science & Technology

E01 Physicochemical analysis and sensory evaluation of different flavoured goat milk yoghurt

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Goat milk contains high nutrition values and can be an alternative to cow milk due to its low allergenic properties while yoghurt is a probiotic product which can provide various health benefits. Dates fruit and palm sugar not only have potential as natural sweetener but also have antioxidant. *Bunga Telang* also rich in antioxidant content especially anthocyanins. Therefore, the aim of this study was to determine the physicochemical properties such as pH, titratable acidity and nutritional values, antioxidant content as well as the sensory evaluation of different flavoured goat milk yoghurt. Dates, palm sugar and *Bunga Telang* were incorporated with goat milk yoghurt using starter cultures of *Lactobacillus acidophilus, Bifidobacterium lactis* and *Streptococcus thermophiles* and were incubated overnight at 43°C. Results indicated all yoghurt samples were increased in acidity throughout 14 days of cold storage. Fibre content was observed in dates fruit yoghurt and palm sugar yoghurt. Results also revealed that antioxidant content was present in yoghurt with the highest content in palm sugar yoghurt, followed by dates and *Bunga Telang* yoghurt. Sensory evaluation results showed that palm sugar yoghurt was the most preferable flavoured goat milk yoghurt, followed by dates fruit, plain and *Bunga Telang* yoghurt. Incorporation of flavours from dates fruit, palm sugar and *Bunga Telang* extract improves nutritional values of yoghurt as well as can enhance its aesthetic appeal.

E02 Isolation and identification of rhizosphere soil bacteria from rice varieties grown under greenhouse environment

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This study focuses on the identification of rhizosphere soil bacteria from rice varieties (*Oryza sativa* and *Oryza glabberima*) grown on greenhouse environment. Samples of *Oryza sativa* and *Oryza glabberima* were collected from the National Cereals Research Institute (NCRI), Amakama, Olokoro, Umuahia and Rice mill at Kpirikpiri Ebonyi State. The rice seeds were planted in nursery and transplanted in buckets under greenhouse conditions (75% humidity and at room temperature 25°C) for artificial growth. Samples were taken to the Microbiology Research Laboratory for microbiological and biochemical characterization. *Oryza sativa* (Nerica5) grew more rapidly than *Oryza glabberima* (M306) because of the variations in rice species and due to the utilization of available nutrients and minerals in the soil with the aid of the microorganisms present. The biochemical tests and the sugar fermentation tests were able to classify the isolates into *Bacillus spp., Azotobacter spp.*, and *Psudomonas spp.* This study showed that there are a lot of rhizosphere soil bacteria in my study area which possibly is going to encourage agricultural production.

E03 Physico-chemical and techno-functional properties of papaya (*Carica papaya*) dietary fibre fractions

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Papaya (*Carica papaya*) is a tropical fruit that is a good source of vitamins, minerals, carotenoids, lycopene, and dietary fibre. In comparison to many other fruit purees, papaya fruit puree can form gels when frozen and thawed or even when stored at refrigeration temperatures for 30 mins. This ability to form gels could be related to the unique properties of its dietary fibres. Therefore, two different fractions of dietary fibre were extracted from papaya puree using water and 72% ethanol and their physico-chemical and techno-functional properties studied. The uronic acid content was quantitated spectrophotometrically, degree of esterification was measured using Fourier Transform Infrared (FT-IR) spectroscopy and molecular weight determined using high-performance size exclusion chromatography (HPSEC). The water soluble fraction (WSF) and ethanol insoluble fraction (EIF) hydrocolloids had higher viscosities (0.2326 Pa.s and 1.8617 Pa.s) and water holding capacities (22.89 g water/g and 61.16 g water/g) when compared to the range of 0.1016 - 0.3243 Pa.s and 6.37 - 27.46 g water/g, respectively, shown by other fruits. They also showed good emulsifying activity (EA) and emulsion stability (ES). Both WSF and EIF gelled at 1% concentration when dispersed in distilled water. However, both fractions had no foaming capacity. Papaya puree dietary fibre fractions generally showed better functional properties in comparison to the other fruit dietary fibres studied. These exceptional functional properties possessed by both papaya dietary fractions suggest their potential applications as functional food ingredients.

E04 *In-vitro* bioaccessibility of spray-dried refined kenaf (*Hibiscus cannabinus*) seed oil applied in coffee drink

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The high nutritional value of kenaf seed oil suggests its application in food industry. This study aimed to investigate the effect of a coffee beverage matrix on the oil release percentage and bioaccessibility of bioactive compounds from microencapsulated refined kenaf seed oil (MRKSO) using an *in-vitro* gastrointestinal digestion model. Refined kenaf seed oil was spray-dried with gum arabic, β-cyclodextrin, and sodium caseinate. Oil release percentage, total phenolic content, radical scavenging activity of DPPH and ABTS, tocopherol and tocotrienol contents, as well as phytosterol content, were measured in the oil released from digested MRKSO along with the coffee matrix and compared to the digested MRKSO without coffee matrix and undigested MRKSO. Refined kenaf seed oil showed a significantly higher oxidative stability index than crude, degummed, and neutralized oil samples. About 91.2 and 94.7% of the oils were released from the digested MRKSO without and with coffee matrix, respectively. Oil released from the digested MRKSO with coffee matrix showed an increase in the total phenolic content (200.5%), DPPH (172.7%), and ABTS (68.1%) values, tocopherol and tocotrienol contents (24.6%), as well as the phytosterol content (62.0%), compared to oil released from the digested MRKSO without coffee matrix. MRKSO was successfully incorporated in the coffee drink and can use as a partial replacement for coffee creamers or supplementation in coffee drinks.

E05 *In-vitro* digestion of refined kenaf seed oil microencapsulated in β-cyclodextrin/gum arabic/sodium caseinate by spray drying

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The high nutritional value of kenaf seed oil suggests its application in food and nutraceutical fields. However, the low stability of highly unsaturated oils limits its applications. This study aimed to investigate the effect of simulated gastrointestinal digestion on the oil release behaviour and bioaccessibility of microencapsulated refined kenaf seed oil (MRKSO). Refined kenaf seed oil was microencapsulated by spray drying using the wall materials of β-cyclodextrin (β-CD), gum arabic (GA), and sodium caseinate (SC) to produce three different models (SC:β-CD, GA:β-CD, GA:SC:β-CD) of MRKSO. An *in-vitro* digestion was used to simulate the human gastrointestinal digestion to examine the oil release behaviour of MRKSO, changes in antioxidant activity and bioactive compounds of undigested oil, digested oil, and digested MRKSO samples. The results showed that three models of the MRKSO offered good protection by a lower percentage of oil released (1.43-6.44%) in the simulated gastric fluid and a high percentage of oil released (81.10-91.19%) after simulated gastric and intestinal phases digestion. The degree of lipolysis was in the order of SC:β-CD > GA:SC:β-CD > GA:β-CD > un-encapsulated oil. Among three models of MRKSO, GA:SC:β-CD offered better bioaccessibility by showing an increase in DPPH (20.0% increase) and ABTS (5.0% increase) values, phenolic content (130.4% increase), tocopherol and tocotrienol contents (147.7% increase), as well as slower degradation of phytosterol contents (59.4% decrease) after *in-vitro* digestion, compared to the undigested kenaf seed oil. This work showed that the microencapsulation of refined kenaf seed oil by spray drying offers an effective controlled release delivery system.

E06 Texture modification of dairy-based foam and emulsion mixed beverage system: The effect on perceived satiation and satiety, and its potential implication in weight management

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In the effort of curbing obesity, food with high satiating power is often used as a tool to reduce calorie intake. Increased complexity of solid food texture has been proven to have such effect in elevating satiating power. In this study, this hypothesis was to put to test in liquid food, using foamed milk tea, *Teh Tarik* (191.5 kJ/100mL, 1.22 g protein, 1.44 g milk fat, 6.9 g total sugars; 5.0 g added sugar) as a beverage model. This study aimed at understanding the effect of texture modified milk tea in the perception of satiety and satiation and explore its potential in portion control. Test sample (250 mL, 478.8 kJ) was added with κ-carrageenan (0.1% w/w), before subjecting to high-shear homogenisation (18,000 rpm, 90s) for aeration and particle size reduction. Test samples together with control were presented to naïve panellists (n=20) to assess their perceived satiation and satiety in terms of hunger, fullness, appetite, and desire for food using visual analogue scales (VAS) and blood glucose changes were recorded at 30-minute intervals for 2h. There was no significant physiological response towards the test sample as the blood glucose reading remained consistent with the control samples over the 2h test period ($p>0.05$). However, psychologically, improvement in fullness sustainability (perceived satiety) ($AUC\_Full_{control}$ = 3550; AUC_Full_{sample}= 4633; $p<0.05$) and hunger suppression (perceived satiation) ($AUC\_Hun_{control}$ = 8171; AUC_Hun_{sample}= 7174; $p<0.05$) could be observed. In terms of reported appetite, a sharp decrease was observed in the prandial phase (dAPP/dT = -1.9) and gradual increase in the postprandial phase (dAPP/dT = 0.28) for control, while the changes were less steep and not significant ($p>0.05$) in the test sample throughout the 2h period. This preliminary study showed that this integrated approach of increasing texture complexity, volume and viscosity in beverage has potential in reducing food portion. The impact of the modification could be further analysed using regression model to optimise the effect and validated with trained panellists.

E07 Physicochemical and nutritional properties of steamed bread fortified with resistant starch

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Many studies have found that diets high in fibre reduced the risks of certain diseases. These contributed to the innovation of food products that contribute to the wholesome digestive system and indirectly to the conservation of general well-being. Thus, this study aimed to determine the effect of incorporation of resistant starch (RS) at different levels of

substitution on the nutritional and physicochemical properties of dough and Chinese steam bread (CSB). In the study, the effect of RS substitution (5%, 10%, 15%, 20%, 25% and 30%) on CSB was investigated. The bread prepared by using soft wheat flour, resistant starch, water, castor sugar, dry yeast, vegetable shortening, salt, and baking powder. The physical, chemical, rheological, and glycemic index of the dough and bread were determined. We found that dough comprising RS showed the highest water absorption (66.00%) and mixing tolerance index (74.67%), as well as the lowest development time (1.33 min), stability (1.27 min), and time to breakdown (1.23 min). Incorporation of RS decreased the specific volume, spread ratio, and all pasting parameters except for pasting temperatures (67.10–83.60°C). CSB supplemented with RS contained 28.19–33.11% moisture, 0.47–0.78% ash, 6.16–8.82% protein, 1.01–1.15% fat, 2.12–2.17% crude fibre and traceable amount of sodium, potassium, calcium, magnesium, and selenium. Greater addition of RS had significantly decreased the glycemic index of CSB (64.22–68.97) compared to control (81.06). The findings conclude that adding RS up to 30% is appropriate to improve glycemic attributes of CSB with minor defects on its physicochemical quality.

E08 Preparation and sensory evaluation of microwaved mushroom crackers with herbs and spices

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The snacks are popular among consumers and available in various flavours. However, these snacks are usually high in calories, salt and sugar thus may affect health if consumed frequently. Plant-based food mushroom are low in calories thus it can be a good alternative to create a healthy snack. Awareness about consumer's demand and acceptability are important for food developers in developing new food product hence, in this study the acceptability of mushroom marinated with herbs and spices chips was assessed through sensory evaluation of the new crackers from mushrooms mixed with various formulation of herbs and spices among the students of International Islamic University Malaysia (IIUM) Kuantan Campus. In this study, *volvariella volvacea* or also known as paddy straw mushroom is used. Sensory attributes that has been test in this study was appearance, aroma, taste, crispiness and overall acceptance. The acceptability was measured using 9-points hedonic scale and total of 35 panellists were used in this study and preparation of mushroom crackers was conducted in the Kitchen of Department of Nutrition Sciences (DNS), Kulliyyah of Allied Health Sciences, IIUM Kuantan. Out of 5 criteria, only crispiness shows significance difference ($p<0.05$) where formulation 3 of mushroom crackers has the highest crispiness level compared to other formulations. The result also shows that the mushroom crackers are equally acceptable for the panellists in terms of appearance, aroma, taste and overall acceptance. In conclusion, formulation 1 (without garlic) and 5 (without turmeric) are the least acceptable to the panellist while formulation 3 (without ginger) has the highest acceptability among the panellist.

E09 Influence of geographical origins and extraction methods on the antioxidant properties of *Kundang* by-products

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Literature has consistently reported that geographical origin and extraction method can influence the antioxidant properties. Therefore, this study aims to evaluate the antioxidant properties of *Kundang* by-products (peels and seeds) from two geographical origins using maceration extraction and ultrasonic-assisted extraction (UAE) methods. Antioxidant activities were determined using 2,2-diphenyl-1-picrylhydrazyl (DPPH) radical scavenging, Trolox Equivalent Antioxidant Capacity (TEAC), Ferric Reducing Antioxidant Power (FRAP) and β-Carotene Bleaching (BCB) assays, while phytoconstituent contents were evaluated using Total Phenolic Content (TPC), Total Flavonoid Content (TFC) and Total Carotenoid Content (TCC). Data was analysed using SPSS Version 26. Mean difference was tested with one-way ANOVA, whilst the correlation between antioxidant activity and phytoconstituent content was analysed with Pearson's Correlation Coefficient Test. Antioxidant activities as determined by DPPH assay ranged from 69.06±0.74% (maceration maprang seed extract) to 89.87±0.43% (UAE plum mango peel extract); while for TEAC assay was 1145.54±1.98 µmol Trolox/100g DW (maceration maprang seed extract) to 2383.50±22.86 µmol Trolox/100g DW (UAE plum mango seed extract). FRAP values was in the range of 12.00±0.00 g $FeSO_4$/g DW (UAE maprang peel extract) to 593.82±24.02 g $FeSO_4$/g DW (UAE maprang seed extract) whereas the beta-carotene inhibition (BCB) was from 29.38±3.32% (UAE plum mango peel extract) to 87.99±4.55% (maceration maprang seed extract). Phytoconstituent contents as evaluated by TPC ranged from 27.92±1.62 mg GAE/g DW (UAE plum mango peel extract) to 127.92± 5.01mg GAE/g (UAE plum mango seed extract) while for TFC was 3931.67±79.50 mg CE/g DW (maceration plum mango peel extract) to 9357.78±83.89 mg CE/g DW (UAE maprang seed extract). Lastly, TCC were reported between 8.70±2.04 µg BC/g DW (maceration maprang seed extract) to 66.77±3.54 µg BC/g DW (UAE plum mango peel extract). Findings from Pearson's Correlation Coefficient Test showed that there was strong positive correlation between FRAP and TPC (r= 0.919), FRAP and TFC (r= 0.982) as well as BCB and TPC (r= 0.849) in maprang by-products. Likewise, strong positive correlation was observed between FRAP and TPC (r=0.952), FRAP and TFC (r=0.731), BCB and TPC (r=0.931) as well as BCB and TFC (r=0.673) in plum mango by-products. Overall, the antioxidant properties of maprang by-products were comparable with that of plum mango by-products while the seed extracts imposed higher antioxidant properties than the peel extracts. UAE yielded higher phytoconstituents compared to maceration. In short, the by-products of *Kundang* fruits contain substantial source of phytoconstituents that possess antioxidant activity.

E10 Glycaemic response to brown rice cooked using rice cooker and draining method

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Diabetes mellitus has raised the concern of public health as its prevalence is gradually increasing in Malaysia. To reduce the risk factors towards type 2 diabetes mellitus, consuming low glycaemic index (GI) foods can prevent large fluctuations in the blood glucose levels. The objective of this study was to determine postprandial glycemic response (GR) of brown rice (BR) cooked using rice cooker method (RC) and draining method (DR). The rate of starch digestion of the cooked rice will determine which cooking method would be more suitable to lower the GI of the cooked BR. Sixteen healthy subjects were recruited (Female: n=9; Male: n=7) in this experimental study. Finger pricking method was used to determine blood glucose level after test or reference food was consumed. Among the test food used is BR cooked with RC method and DR. The reference food was white bread and glucose solution. It was hypothesised that brown rice cooked using draining method would

result in a slower glycemic response. However, after comparing the results between RC and DR, there is no significant difference in the incremental area under curve, time to peak and peak blood glucose ($p>0.05$). The GI of cooked BR by RC and DR were 87.71±32.95 and 93.13±45.97 when glucose solution was the reference food; 80.19±4.68 and 84.51±58.38 respectively when white bread was the reference food. There is also no significant difference in the GI and GR of cooked BR between both cooking methods. Irrespective of either cooking method used, the BR was ranked into the high GI category when glucose solution and white bread were used as reference food.

E11 Dietary fibre of pineapple (*Ananas comosus (L.) Merr.*) wastes and its resistance towards α-amylase and stomach acid juice *in vitro*

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Pineapple (*Ananas comosus (L.) Merr.*) is the only important fruit crop in the family of *Bromeliaceae.* Approximately up to 80% of pineapple fruit is discarded as these wastes have high biological oxygen demand and chemical oxygen demand values. Due to their high nutritional value, they can be incorporated into food products. This study was conducted to determine the dietary fibre of MD2 pineapple's crown and peels and its resistance towards α-amylase and stomach acid juice *in vitro*. Both pineapple crowns and peels were collected at P*usat Pengumpulan Hasil, Jabatan Pertanian Serdang*, Selangor. Upon collection, they were cut, cleaned, oven-dried, homogenised, and analysed for dietary fibre content by using the enzymatic-gravimetric method. The digestibility's experiment was analysed with phenol-sulphuric acid and DNS-acid assays to determine total sugar and reducing sugar content respectively. The amount of total dietary fibre (TDF) and insoluble dietary fibre (IDF), as well as α-amylase enzyme digestibility were significantly different ($p<0.05$) between both samples, where the values were higher in crowns than in peels. However, the soluble dietary fibre (SDF) content and simulated gastric juice digestibility were not significantly different ($p>0.05$) between the samples. Both samples could be a potential source of prebiotics as they fulfilled the first criteria of a prebiotic, i.e the ability to resist the host's digestion, as more than 80% of the samples were resistant towards the α-amylase enzyme and the simulated gastric juice. To some extent, its resistance during the digestion process could be influenced by the amount of fibre present in the samples, as IDF ($r=-0.984$) and TDF ($r=-0.986$) were negatively and significantly ($p<0.05$) correlated with the sample resistance towards α-amylase enzyme activity. This study showed that pineapple wastes have the potential to be converted into value-added food products and further research is warranted to characterise the bioactive compounds in these samples.

E12 Production of water soluble *Heterotrigona itama* propolis powder: evaluation of their antioxidant properties

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A water soluble propolis powder was produced from fresh *Heterotrigona itama* propolis collected from Laman Kelulut MAEPS, Serdang. However, since more than 50% of the propolis composition is composed of resin and wax, the extraction method to remove this substance to produce water soluble propolis extract should be implemented. Water extraction of fresh propolis has been used in this study through direct heating and double boiling technique. The pooled extracts were then dried to produce powder using an oven and freeze dry method. Four different water soluble propolis powders were produced which are namely as oven-dried: direct heat (OD-DH), oven-dried: double boil (OD-DB), freeze-dried: direct heat (FD-DH), and freeze-dried: double boil (FD-DB). The obtained of all water soluble propolis powder were measured for total polyphenol content (TPC) using Folin-Ciocalteu method, and antioxidant activity (AOA) were assayed by ferric reducing antioxidant power (FRAP) and 2, 2-phenyl-1-picrylhydrazil (DPPH) radical scavenging. The EC_{50} (concentration required to obtain a 50% antioxidant effect) value was also measured. Results of the study showed that, water soluble FD-DH propolis powder significantly ($p<0.05$) gives the highest value for all the assay. Direct heating of fresh propolis followed by drying using freeze dry is the best method to produced water soluble propolis powder from *H.itama*. A strong antioxidant activity and higher phenolics contents in this water soluble propolis powder suggested that it has great potential in the food industry as a functional food ingredient.

E13 Sensory evaluation of rice straw *(volvariella volvacae)* mushroom mixed with spices and herbs crackers by air frying method

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Snacks are well-known among consumers and come in a variety form. The availability of snacks in the market is high in calories, sugar, salt as preservatives but low in nutrient content. Current food system that is not focusing on the development of healthy snacks and abundance of unhealthy food choices contributed to the lack of exposure among consumers to healthier food choices. This research was carried out to develop the acceptable and healthy chips by using rice straw mushroom *(Volvariella volvacea)* with the mixture of different formulations of herbs and spices. The combination of rice straw mushroom *(Volvariella volvacea)* and mixture of herbs and spices were known to produce better nutritional quality of chips. The mushroom chips were developed and the sensory evaluation result was analyzed in terms of sensory attributes and overall acceptability. Six different formulations of mushroom chips mainly formulated from a mixture of herbs and spices such as cinnamon, ginger, onion, garlic, turmeric and holy basil. A total of 35 panelists were randomly selected as volunteers to evaluate the acceptability of sensory attributes of the experimental six different formulations of mushroom chips. There is no significant difference in sensory attributes such as appearance, aroma, taste, texture and overall acceptance of all six formulations observed, which made it equally acceptable to panelists. Formulation 3 has found to be the most preferred mushroom chips formulations in terms of sensory attributes. The outcome of this study can be made as valuable information in producing a healthy snack as an alternative.

E14 Proximate composition and sensory evaluation of noodles made from wheat flour and composite barnyard millet flour

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Noodles are widely consumed throughout the world. It is a fast-growing sector because noodles are convenient, low cost, and easy to cook. Besides, it also has a relatively long shelf life. Noodles are one of the essential and staple foods in many Asian countries that have been consumed for thousands of years. Most of the noodles that are commercialised in the market are commonly made from wheat flour that is rich in carbohydrate but lacking in crucial nutrients such as dietary fibre. Hence, grains composite flour products are primarily targeted as the vital carriers of nutrition and can also promote health benefits for consumers. The utilisation of composite barnyard millet flour for the preparation of noodles is suitable due to its higher dietary fibre content. The purpose of this study was to determine the nutrient composition of food product (noodles) made from wheat flour and composite barnyard millet flour. The sensory evaluation was also evaluated which include the attributes of appearance, aroma, color, firmness, taste, and overall acceptability of noodles samples. The proximate composition was analysed using AOAC international methods. Sensory evaluation was involved with 21 untrained panellists among students from Universiti Putra Malaysia. Nutrient composition of noodles showed that 1.08% of ash and 6.42% of dietary fibre content was significantly higher ($p<0.05$) in composite barnyard noodles against wheat noodles sample of 0.45% and 1.92% respectively. However, fat content decreased significantly ($p<0.05$) in composite barnyard noodles (0.96%). No significant difference ($p>0.05$) was observed in moisture, protein and available carbohydrate content between composite barnyard noodles and wheat noodles. For the sensory evaluation, it seemed that commercialised wheat noodles are more acceptable followed by handmade wheat noodles while the composite barnyard millet noodles were the last choice by the panellists. However, the composite barnyard noodles received sensory score of 6 which was slightly acceptable by the panellist, thus the noodles variants could be potentially consumed and give health benefits to the consumer.

E15 Sensory evaluation of rice straw mushroom mixed with herbs and spices crackers by pan-frying method

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The intake of snacks such as crisps, biscuits, cakes, and sweet pastries is increasing among university students. These snacks usually contain high calories but low in nutrients. The objective of this research was to developed acceptable and healthy crackers made of rice straw mushroom that is mixed with herbs and spices in a variety of formulations by a pan-frying method. The crackers were made up using mushrooms, herbs, and spices that showed to provide health benefits such as anti-diabetic, anti-inflammatory, anti-oxidant, anti-hyperlipidemia, and anti-hypertensive. Pan-frying was chosen as the

cooking method as it provides a better quality of fried food that uses a thin layer of oil while remaining the fried food properties. Six formulations which consist of different mixture of herbs and spices which are cinnamon, garlic, onion, ginger, holy basil, and turmeric were subjected to sensory evaluation by 35 untrained panelists that consist of university students from International Islamic University Malaysia, Kuantan. The sensory evaluation involved 5 parameters which were appearance, odor, taste, texture, and overall acceptance that conducted using the 9-point hedonic scales. Analysis of variance (ANOVA) and the Tukey post-hoc test was used to determine the significant mean difference in the sensory attributes among the formulations at a 95% confidence interval ($p<0.05$). The statistical analysis showed that there were no significant differences ($p>0.05$) in terms of appearance and odor while significantly differences ($p<0.05$) in the texture, taste, and overall acceptance attributes. The result of the study showed that formulation 6 without the presence of turmeric is the most acceptable crackers due to its odor, taste, texture, and overall acceptance modalities.

E16 Effect of gamma irradiation on proximate composition, antioxidant content, and activities of *Carica papaya L. var. sekaki*

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Food irradiation is applying ionizing or non-ionizing radiation such as gamma rays, x-ray, and electron beam to preserve food, prolong shelf-life, prevent spoilage, and eliminate the foodborne disease. *Carica papaya* Linn has a short shelf life which lasts for 4-7 days at 25°C and 2 weeks at 12°C, therefore, irradiation can prolong the shelf life of fruits. This study aimed to determine the effect of gamma irradiation on proximate composition, antioxidant content, and activities of non-irradiated and irradiated (3kGy, 6kGy, and 9kGy) of *Carica papaya L.var sekaki* powder. The samples were evaluated on moisture, ash, total available carbohydrate, protein, fat, and crude fibre. Total antioxidant content was determined by using Follin Ciocalteu method for total phenolic content (TPC) and aluminum chloride colorimetric assay for total flavonoid content (TFC) while total antioxidant activities were determined using DPPH radical scavenging assay and ferric reducing antioxidant (FRAP) assay. The result showed protein was significantly reduced after being irradiated at 9kGy but not significant at lower doses (3 and 6kGy) when compared to the non-irradiated sample. Besides, crude fibre was significantly reduced for all irradiated samples. Meanwhile, moisture, ash, total available carbohydrate, and fat were not significantly different when compared between non-irradiated and irradiated papaya. Besides, irradiated papaya at 3kGy exhibited the highest total phenolic content and significant when compared to other samples while non-irradiated papaya exhibited the highest TFC and significant when compared to all irradiated samples. Besides, the non-irradiated papaya also showed the highest DPPH scavenging activity but not significant to the irradiated samples except for the 6kGy sample. The irradiated papaya at 3kGy contributed the highest FRAP reducing power and significantly different compared to other samples. TPC and FRAP scavenging activity were enhanced by gamma irradiation particularly at a lower dose (3kGy). In conclusion, gamma irradiation has not affected proximate compositions except for protein and crude fiber. Moreover, gamma irradiation has markedly increased the antioxidant content (TPC) and activity (FRAP).

E17 Effect of gamma irradiation on proximate composition, antioxidant content, and activities of *Musa paradisiaca Formetypica L. var. nangka*

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Food irradiation is one of the non-thermal food processing methods that can be used to extend the shelf-life of a particular food and the commonly used is gamma irradiation. In this study, banana (*pisang nangka* variety) was used to determine the effects of gamma irradiation on its proximate composition, antioxidant content, and activities. The moisture, ash, crude protein, and crude fat of non-irradiated and irradiated (3 kGy, 6 kGy, and 9 kGy) banana powder were analyzed using AOAC 2000 methods except for total available carbohydrate. The antioxidant ability of the extract was determined by using total phenolic content (TPC), total flavonoid content (TFC), Diphenyl-1-Picrylhydrazyl (DPPH) free radical scavenging assay, and ferric reducing antioxidant potential (FRAP) assay. The proximate composition was not significantly ($p>0.05$) different between non-irradiated and irradiated samples, except for the total available carbohydrate and crude fat content ($p<0.05$). Besides, there was no significant difference of TPC between non-irradiated and all irradiated extracts but it showed a slight increase of TPC in lower doses of irradiation. Irradiated sample extracts at doses 6 and 9 kGy showed a significant decrease ($p<0.05$) in TFC. There was no significant difference ($p>0.05$) in DPPH and FRAP scavenging activities between non-irradiated extract and all irradiated extracts but it showed a slight increase especially at lower doses of irradiated extracts (3 and 6kGy). Overall, gamma irradiation has not affected the proximate composition of banana except for total carbohydrate and crude fat contents. Moreover, the application of gamma irradiation showed increasing in the antioxidant contents and activities of banana, particularly at the lower doses. Gamma irradiation has the potential to be one of the approaches to preserve the fruits and at the same time to maintain or increase the nutrients and antioxidant properties of the fruits.

E18 Physicochemical, sensory and antioxidant properties of persimmon (*Diospyros kaki* L.) leaves cookies

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This study was conducted to investigate the physicochemical, sensory, and antioxidant properties of persimmon (*Diospyros kaki L.*) leaves cookies. Three types of persimmon cookies were prepared: (1) persimmon leaves powder (PLP) cookies; (2) PLP with defatted rice bran (DRB) cookies; and (3) PLP low-sugar cookies with DRB. All types of cookies were formulated with different PLP concentrations (0%, 2.5%, 5.0%, and 7.5%). Physicochemical and sensory properties, consumer acceptance, total phenolic content (TPC), ferric reducing antioxidant power (FRAP), and diphenylpicrylhydrazyl (DPPH) radical scavenging activity were determined. Based on the results, incorporation of PLP has improved the fibre, protein, and ash contents of the cookies. Moreover, 7.5% PLP low-sugar cookies with DRB showed the highest TPC, FRAP, and DPPH scavenging activities. However, these readings

decreased from Day 0 until Day 14. The overall acceptability score of all PLP cookie types decreased with the increase of PLP, but most consumers were "somewhat interested" to buy these functional cookies. In conclusion, PLP, in addition to DRB, has shown to improve the nutraceutical properties of the cookies, but the flavour needs to be further modified to suit consumers' sensory preference.

E19 Sensory evaluation in determining consumers' acceptability of rice straw mushroom crackers mixed with herbs and spices

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Crackers are known to be one of the popular types of junk food that is highly consumed due to the appetising appearance, aroma, taste and crispness. This research was carried out to develop the acceptable and healthy crackers by using rice straw mushroom (*Volvariella volvacea*) with the mixture of different formulations of herbs and spices. The combination of rice straw mushroom (*Volvariella volvacea*) and mixture of herbs and spices known to produce better nutritional quality of crackers and would be highly preferred in a matter of producing healthy snacks. In this study, the crackers were develop and analysed in term of sensory attributes and overall acceptance. The crackers tested comprised of six different formulations which mainly formulated from mixture of herbs and spices which are cinnamon, ginger, onion, garlic, turmeric and holy basil. 35 panelists were randomly selected to evaluate the acceptability in term of sensory attributes of the newly developed crackers of six different formulations. Consequently, no significant difference in appearance and aroma of all crackers formulations were observed, which made it equally acceptable to the panelists. The sensory evaluation also revealed significant difference ($p<0.05$) in term of taste, crispness and overall acceptance of the crackers. F6 was found to be highly acceptable with respect to sensory characteristics especially in term of appearance, taste and crispness. The outcome of this research can be used as valuable information for the development of healthy snacks as a good substitute to junk foods.

E20 Glycemic response of white rice using rice cooker and draining method

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Rice is a staple food consumed by 3.5 billion people around the world, mainly the Asia Pacific Regions that includes Malaysia. About 48.3% of Malaysian's consume white rice. White rice has a high glycemic index (GI) compared to brown rice and whole grains. GI is used to measure the impact of carbohydrate to the blood glucose level. Consumption of high GI food elevates the blood sugar level and stimulates beta cells to produce more insulin to regulate blood glucose level. A decrease in beta cell stimulation can impact the blood glucose and insulin level hence contributing to type 2 diabetes mellitus (T2DM). With

the increasing prevalence of diabetes mellitus, in a country with rice as staple food, we intend to explore a recommended cooking method of either rice cooker or draining that can ease the problem as the effect of these two cooking method on the postprandial glycemic response of white rice has not been reported. This study aimed to investigate the glycaemic response to white rice cooked using the rice cooker and draining method among Malaysian adults. To study the postprandial glycemic response, a total of 16 healthy adults were recruited in this study. Subjects were required to consume 2 reference foods (white bread and glucolin drink) and 2 test foods [white rice-cooked using rice cooker method (RC) and draining method (DR)]. Capillary blood was collected at 7 different time points (0, 15, 30, 45, 60, 90 & 120 mins) post consumption. A Reflotron Plus system was used for blood glucose analysis. Postprandial glycemic respond was obtained from blood glucose response curve (iAUC). Results shows there were no significant differences in mean iAUC (p=0.411), mean peak of postprandial blood glucose level (p=0.295), mean time taken to reach peak postprandial blood glucose level (p=0.646) and the mean GI of white using the rice cooker and draining method was (p=>0.005). However, the draining method had a higher iAUC, postprandial blood glucose level, time taken to reach peak postprandial blood glucose level and GI of white rice compared to the rice cooker method. Overall, there was no difference in cooking the rice using both the cooking method. However, rice cooker method may be preferable as compared to draining method for better glycaemic management.

E21 Palm mid fraction raise postprandial glucose dependent insulinotropic polypeptide (GIP) level compared to shea butter

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Palm mid fraction (PMF) and shea butter (SB) have been used widely as cocoa butter equivalent for chocolates and confectionary products. Both PMF and SB have different melting characteristics that may affect postprandial gut hormone and satiety response. We aim to study the postprandial effects of PMF and SB fats on gut hormone markers and satiety levels. A randomised, double-blind crossover orthogonal Latin-square design was used in this postprandial challenge. A total of 36 healthy adults participated in the feeding intervention. Each subject received 3 experimental meals prepared with ~ 50 g of PMF, SB and oleic acid rich fat (as control) respectively in the form of muffin. A visual analogue scale (VAS) was used for the measurement of satiety levels. We found that both PMF and oleic acid rich diets exert similar and higher postprandial GIP but differed from that of a SS diet ($p<0.05$). No differences were observed on plasma GLP-1, PYY, ghrelin and VAS across the 3 test diets. Our study suggests that the positional distribution of triglycerides with either palmitic, stearic or oleic acid at the sn-1 and -3 positions as present in PMF, SB and oleic acid rich fats plays an important role in affecting postprandial gut hormone and satiety response.

E22 Nutritional, sensorial and technological characteristics of synbiotic yogurt drink enriched with prebiotic inulin

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In recent years, global demand for functional foods grew tremendously due to the rising trend of health-conscious consumers. Driven by increased awareness of probiotic products, consumption of yogurt drink is gaining popularity across all age groups. In the present study, we aimed to assess sensorial, nutritional and technological properties of synbiotic yogurt drink enriched with prebiotic inulin. Sensory analysis, proximate compositions, viscosity, viable count and DPPH radical scavenging activity were examined in control (without inulin) and 3 variants of inulin-supplemented synbiotic yogurt drink, namely F1 (4%, inulin), F2 (4.5% inulin) and F3 (5% inulin). Evaluated by 75 consumer panels on 9-point hedonic scales, F3 showed significantly ($p<0.05$) higher overall acceptability (5.79±1.94) compared to control. In addition to lower calorie content (36.52 kcal/100 ml), nutritional and technological properties of F3 [total dietary fibre content (4.03±0.04 g/100 ml), viscosity (28±6.93 cP), viable count (87.00±4.00 x 10^6 CFU/ml *S. thermophilus*; 14.67±3.51 x 10^6 CFU/ml *L. bulgaricus*) and antioxidant activity (50.40±1.80%)] were significantly ($p<0.05$) improved compared to control. Remarkably, the new formulation complied with nutrient criteria for Healthier Choice Logo Malaysia in addition to meeting requirements for "low fat" and "high dietary fibre" contents according to Malaysia Guide to Nutrition Labelling and Claims. Hence, we conclude that 5% inulin improved nutritional and technological characteristic in synbiotic yogurt drink without compromising consumers' acceptance.

Group F: Experimental Nutrition

F01 Anti- thrombolytic activity of zingerone against high fructose diet induced non-alcoholic steatohepatitis in rat model

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Zingerone, an active compound of ginger and derived from the activation of gingerol has shown many pharmacological and biological properties such as anti-inflammatory, anti-diabetic, anti-lipolytic, anti-diarrhoeic, antimicrobial and anti-spasmodic. The present study was done to evaluate the anti-thrombolytic activity of zingerone against high fructose diet induced rat models. Male Wistar rats were randomly divided into 4 groups: group 1 was fed with standard pellet and water; group 2 was fed with normal pellet, Zingerone of 100 mg/kg body weight of rats and water; group 3 was fed with fructose enriched diet (40%) and fructose drink (20%); and group 4 was fed with fructose enriched diet (40%), fructose drink (20%) and zingerone of 100 mg/kg body weight of rats. Coagulation parameters and thrombus evaluation in liver were done to investigate the effect of zingerone as anti-thrombolytic agent. The high fructose enriched diet group showed thrombus formation and elevated prothrombin time and activated partial thromboplastin time. Treatment with zingerone has reversed the metabolic changes by reducing the thrombus formation in the liver and also by reducing the prothrombin time, activated partial thromboplastin time within the normal range. Hence zingerone may have antithrombolytic activity *in vivo* in rat liver NSAH and hence further investigation is needed to understand the mechanism of action.

F02 Profortil prevents some of the leptin-induced adverse effects on sperm in *Sprague-Dawley* rats

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Serum levels of leptin, an adipocyte derived hormone, correlate positively with the amount of adipose tissue in the body. Excessive levels of leptin can have a detrimental effect on the male reproductive system and could be involved in obesity-associated infertility in the male. Exogenous leptin administration to rats has been shown to have adverse effects on sperm count and morphology; possibly involving the PI3K pathway and increased oxidative stress. This study therefore, investigated the effects of Profortil, a drug used in the treatment of male infertility, on leptin-induced effects on sperm parameters in rats. Four groups of adult *Sprague-Dawley* rats were administered once daily with either normal saline, or leptin (60 µg/kg/day, *i.p.*), or Profortil (50 mg/kg/day), or leptin and Profortil together. Leptin and Profortil were given for 2 and 3 weeks respectively. At the end of the treatment, total sperm count, fraction of sperm with abnormal morphology, serum testosterone, CYP17a1, CYP19a1, 17βHSD, 8-OHdG and total antioxidant capacity (TAC) were determined. Sperm count was significantly lower but the fraction of sperm with abnormal morphology and 8-OHdG concentration were significantly higher in leptin-treated rats. Profortil seem to have prevented the leptin-induced decrease in sperm count. It also prevented leptin-induced increase in 8-OHdG. Fraction of sperm with abnormal morphology in leptin+Profortil-treated rats was slightly lower than that in leptin only treated rats. No significant differences were seen in the concentrations of testosterone, CYP17a1, CYP19a1, 17βHSD and TAC between the four groups. In conclusion, it appears that Profortil at a dose of 50 mg/kg/day, reduces oxidative stress, as indicated by lower levels of 8-OHdG, and prevents some of the leptin-induced adverse effects on sperm. Clearly, its role in preventing leptin-induced adverse effects in sperm requires further investigations.

F03 Synergic effect of vitamin D supplementation and PARP inhibitors on TNBC cell line proliferation

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Triple-negative breast cancer (TNBC) has a high mortality rate with aggressive proliferation and metastasis and a lack of effective therapeutic options. Some poly (ADP-ribose) polymerase inhibitors (PARPi) such as Talazoparib, have been tested in patients with metastatic breast cancer. However, the side effect of using the effective therapeutic dose is a concern. Evidence exists about Vitamin D's regulatory effect on cell junction molecules' formation and degradation in some cancer cells, which affects cell viability. The present study's objective was to investigate the synergic effect of Vitamin D (Calcitriol) and Talazoparib on MDA-MB-468, a TNBC cell line. The cell line proliferation was assessed using the MTT test and determined by the dose-response curve. The range of concentration was 2x dilution of Talazoparib (between 200 µM to 0.01 µM) and 10x dilution of Calcitriol (ranged 10 µM to 0.001 µM). The cells were treated with the combination of Calcitriol and Talazoparib based on the IC50, which was obtained in this study. The IC_{50} of Calcitriol alone and Talazoparib alone was 0.3623 µM 0.3049 µM, respectively. The synergic effect of 0.001 µM Calcitriol and Talazoparib reduced the IC50 of Talazoparib to 0.02102 µM. In conclusion, even the proliferation of MDA-MB-468 was inhibited by both Calcitriol and

Talazoparib alone, the synergic effect of vitamin D with Talazoparib had an inhibitory effect on MDA-MB-468 proliferation in a lower dose of Talazoparib.

F04 Safety assessment of a novel plant-based milk alternative from kenaf (*Hibiscus cannabinus* L.) seeds through acute oral toxicity study

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Kenaf (*Hibiscus cannabinus* L.) seeds have been discovered to possess the ability to produce milk-like solution when soaked seeds were grounded with excess water, just like soybean milk (SM). Kenaf seed milk (KSM) can be further processed into innovative food products like tofu, milk beverage and cream cheese. However, for human consumption, safety evaluation of this novel plant-based milk is necessary. Toxic effects such as poor absorption of essential nutrients and impaired metabolism caused by plant seeds are often associated with their antinutritional factors that particularly present in seed hulls. In this study, biological effects from KSM consumption were investigated using an *in vivo* model through acute toxicity study. Comparisons to SM were also made. The study was carried out at a single test dose of 9.2 ml/kg of body weight and the treatment resulted in no sign of toxicity including mortality after 14 days of observation. Rats presented normal behavior, physical appearance and physiological state. Hematological parameters (red blood cell, hemoglobin, packed cell volume, mean corpuscular volume, mean corpuscular hemoglobin concentration, white blood cell, neutrophils, lymphocytes, monocytes, eosinophils and platelets) were not significantly affected ($p>0.05$). Serum biochemical analysis revealed that KSM consumption induced a significant reduction ($p<0.05$) in total protein level, but still within the normal range. Liver weight also significantly decreased ($p<0.05$). Nonetheless, other vital organs were not significantly influenced ($p>0.05$). Overall, there are no major toxic effects of acute KSM consumption. Thus, there is the potential of developing KSM as a novel plant-based milk alternative. This is the first study to report on *in vivo* biological effects following consumption of seed milk derived from kenaf seeds. Further investigations including 28-day and 90-day repeated dose oral toxicity studies, and a clinical trial are warranted to declare safe long-term KSM consumption.

F05 Cytotoxicity assessment of Ceri Terengganu and Kuini extracts against cancer cell lines

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Nowadays, food and natural ingredients have been connected to specific health benefits, from prevention of particular cancers to reduction of blood cholesterol and new branded food products with explicit health claims have also been introduced in the market. Ceri Terengganu (*Lepisanthes fruticosa*) and Kuini (*Mangifera odorata*) are some of the indigenous fruits available in Malaysia, known as *Buah Nadir.* Though these fruits are known to be a non-seasonal fruit species which produce fruits throughout the year, yet they are still underutilised. Preliminary studies showed that these fruits have gained attention due to its

high antioxidant value. The objective of the study is to access the potential of these fruits extract on cell lines (normal and cancer cell lines) by using MTT assay. Results evaluated from these four extracts (by methanol extraction) revealed that these extract does not inhibit the growth of normal cell line used in this study (MRC5. VERO and 3T3), but affecting the growth of selected cancer cell lines. Extract of kuini kernel demonstrated a promising result on HepG2, MCF-7 and CRL1739 cell lines, where the IC50 are 18.5 µg/ml, 22.5 µg/ml and 22 µg/ml, respectively. Whereas immature ceri Terengganu extracts showed cell growth inhibition on HepG2 and MCF-7 cell lines with IC50 37.5 µg/ml and 27.5 µg/ml, respectively. From this cytotoxicity assessment, it was proven that some part of these fruit have a potential anticancer activities against selected cancer cell lines. Exploring the molecular mechanism underlying the *in vitro* anticancer effects of these extracts on cancer cell lines would be an interesting adventure as we are currently moving towards the discovery and development of neutraceuticals and functional foods era.

F06 Antiulcer activity of *Spirulina platensis* and golden kiwifruit extracts on indomethacin-induced gastric ulcer in rats

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Non-steroidal anti-inflammatory drugs (i.e. indomethacin) used as painkillers are accompanied with serious adverse effects in upper gastrointestinal tract and small intestine, which mainly cause peptic ulcers. Therefore, this research aimed to investigate the effects of *Spirulina platensis* (SP), golden kiwifruit flesh (KF) and its peel (KP) extracts individually or combined (SFP) against indomethacin-induced gastric ulcer in rats. The HPLC quantitative analysis revealed that chlorogenic, protochatechuic and caffeic acids were the predominant phenolic acids and catechin was the predominant flavonoid in SP, KF and KP, respectively. Experimental rats were then classified as GI (normal group); ulceration was induced in GII (positive group), GIII, GIV, GV, GVI, and GVII groups by a single oral administration of indomethacin (30 mg kg^{-1} body weight). KF, KP, SP, and SFP extracts were orally administrated at a dose of 30 mg kg^{-1} bw as TPC equivalent to ulcerated rats groups GIII, GIV, GV, and GVI, respectively. Lansoprazole (30 mg kg^{-1} bw, as reference drug) was given to group GVII. After two weeks, ulcer index (UI), protection index (PI %), vitamin B_{12}, iron and hemoglobin (HB) levels were determined. Results indicated that intragastric administration of indomethacin induced linear hemorrhages and ulceration craters in the mucosal layer with a significant increase of UI, which was significantly attenuated by SP, KF, KP, and SFP extracts when compared with group GII. SP group recorded the highest PI (80.79%) when compared with Lansoprazole group (74.86%). Administration of indomethacin significantly reduced vit. $B_{12,}$ iron and HB levels compared to GI. However, KF, KP, SP, and SFP extracts increased plasma vit. B_{12} by 33, 26, 10 and 46%, respectively. Indeed, Lansoprazole did not significantly improve vit. B_{12} level as observed in group GVII. In addition, iron and HB were significantly increased by the administration of SP and KF compared to GII group. All given extracts were markedly attenuated the serum levels of malondialdehyde, reduced glutathione, and superoxide dismutase. Thus, these data suggested that SP, KF, KP and SFP extracts have a gastroprotective potential against indomethacin-induced gastric ulceration and the antioxidative and anti-inflammatory properties are probable mechanisms.

F07 The effect of taking instant vegetable cereal on blood enzymatic antioxidant in aged rats

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Instant vegetable cereal is a nutritious food for elderly which is rich in minerals and antioxidants. It was formulated from red amaranth, corn, barley and pineapple using drum dryer. This study was carried out to determine the antioxidant content in instant vegetable cereal and its efficacy in increasing antioxidant content in blood serum. Antioxidant actitvity were determined using three different methods [2,2-diphenyl-1-picrylhydrazil (DPPH), ferric reducing antioxidant power (FRAP) and ferrous ion chelating (FIC)]. While for antioxidant content in blood serum, blood from twelve rats aged 10-12 month old (429.4±15.2 g) were collected and analysed for glutathione reductase (GR), glutathione peroxidase (GPx) and superoxide dismutase (SOD). Treated rats (n=6) were given 3.1 g/kg instant vegetable cereal by incorporating the sample in feed, while control rats were taking normal feed for 28 days. Antioxidant assay of the sample showed a high radical scavenging (DPPH) activity with 91.69±0.54% and ion chelating activity (FIC) up to 90.24±0.52%, while ferric reducing power was at 0.67±0.02 mg $FESO_4$ Eq/100g. Serum antioxidant content in rats treated with instant vegetable cereal were higher as compared to the control group in GR (24.71±2.39 nmol/min/ml) and GPx (322.19 nmol/min/ml), while SOD level in treated rats were at par with control group. Instant vegetable cereal is a nutritious food that rich in antioxidant and provenly improved blood antioxicant level in aged rats. Therefore this nutritious food is suitable for aged group citizen as daily intake meal in maintaining their health status.

F08 Subacute oral toxicity of spiced heritage drink and its low-sugar version in *Sprague-Dawley* rats

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The traditional botanical formula of spiced heritage drink (SHD) consists of 18 culinary spices, and medicinal herbs are ceremonially served as a refreshment or tonic in Southern Johor, Malaysia. A low-sugar version (LSH) was developed to cater to the needs of diabetic and weight-conscious consumers. Here we assessed its subacute toxicity and functional properties for safety and potential therapeutic information. Both SHD and LHS were administered to female rats at 3 dosages: 1.25 mL/kg (low-dose), 2.5 mL/kg (medium-dose), 5.0 mL/kg (high-dose) for 4 weeks. Clinical signs, mortality, body and organ weights, and food intake were monitored. Blood samples were collected for fasting blood glucose and hematological assessments. Subacute treatment of SHD and LHS had no significant effects on clinical signs or food intake in the animals. Still, it showed a significantly low body weight gain than the control ($p<0.05$). Measurement of hematological parameters revealed significant increments in WBC, lymphocytes, and granulocyte counts ($p<0.05$) in SHD treatment groups. Hb and RBC counts were significantly increased in both treatment groups of SHD and LHS. However, the changes were considered physiologically to be normal for rats and were not severe. Our data provide scientific evidence on the safety of SHD and LHS for potential development as functional drinks for weight management and anemia.

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