36th Scientific Conference

Theme

Nutrition: The Key to Combating Prevailing Health Threats

Programme & Abstracts

7 – 8 September 2021

ZOOM Online Platform

Mead Johnson Nutrition™

SUSTAGEN

Membantu memberikan

Khasiat Optimum*

97%
kanak-kanak suka rasanya**

Tinggi dengan **Vitamin A,B2,B12,C**

Tinggi dengan **Zat Besi, Kalsium, Protein**

23 Nutrien Penting

Membantu Memberi **Khasiat Optimum***

*Dengan hidangan makanan seharian.
**"Sustagen Product Claims Test" diuji pada 100 ibu di seluruh Semanjung Malaysia.

Contents

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12-A, Jalan PJS 8/4, Mentari Plaza, Bandar Sunway,
46150 Petaling Jaya, Selangor.
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Dr Yasmin Ooi Beng Houi

President's Welcome Message

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

On behalf of the Organising Committee, I welcome everyone to the 36th Annual Scientific Conference of Nutrition Society of Malaysia (NSM). Unfortunately with the current on-going COVID-19 pandemic, we have to bring you this annual scientific conference via virtual platform again. Nevertheless, the traditional annual nutrition conference that everyone looks forward to must go on!

As we are all aware, the nation has been under the health threats posed by the double burden of malnutrition for more than three decades. Energy and nutrient deficiencies persist among specific communities, while non-communicable diseases (NCDs) affect wide segments of the population. Although these nutritional problems have received considerable attention, systematic actions to combat them are clearly not adequate. We are still struggling in dealing with the high rates of morbidity and mortality resulting from NCDs.

And for the past year and a half, the country has been hit by yet another health threat: the COVID-19 caused by the coronavirus. This pandemic, which continues to rage across the globe, has highlighted the importance of good nutrition and healthy lifestyle as the key to strengthening immunity so as to combat the pandemic. It has also been established that individuals with underlying NCDs are at an increased risk of more severe COVID-19 complications and mortality, should they become infected. Due to this inter-connected nature of NCDs and COVID-19, it is even more important now for the vulnerable groups and people with underlying medical problems (e.g. NCDs and their risk factors) to pay attention to their health and nutrition. The pandemic should act as a catalyst for us to focus our effort and investment in improving our healthy diet and physical activity.

The whole-of-society approach is now more crucial than ever in tackling NCDs and this new health threat called COVID-19. It is essential for various stakeholders including government agencies, academic institutions, professional bodies and private sectors, as well as the public to collaborate together to systematically implement the identified strategies and action plans. It is even more crucial for all stakeholders to form strategic alliances, and pool together all the required resources to combat nutrition-related problems in the country.

We have therefore chosen "Nutrition: The Key to Combating Prevailing Health Threats" as the theme of the 36th NSM Annual Scientific Conference, to underscore the importance of nutrition as the key to NCDs prevention, strengthening immunity and combating these health threats.

With the COVID-19 pandemic turning into the endemic phase, in which it will eventually be part of our daily lives, health, nutrition and immunity will continue to be importance to everyone. As nutritionists, we should continue to build on this interest and make healthy eating practices and active lifestyle as their way of life in order to prevent problems related to under- and over-nutrition, not just COVID-19.

I hope everyone will make full use of the knowledge sharing put up during the conference and take the opportunity to browse the conference website to view all the conference materials, scientific posters and the virtual booths to make the best of this event.

Lastly, I would like to extend my sincere gratitude to all who have contributed to the successful organisation of this second 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 18th Council Members 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.

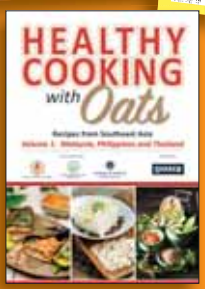
For more information, visit our website:
www.nutriweb.org.my

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

NSM Nutrition Roadshows 2.0

A nutrition promotion programme of the Nutrition Society of Malaysia

"Improving lives through nutrition"

Focusing on

Healthy Eating

Active Living

OBJECTIVES

- to foster community awareness on importance of assessing their nutritional status regularly
- to inspire and empower the community with knowledge and skills in practising healthy eating and active living
- to serve as capacity building and partnership platform for nutritionists in promoting optimal nutritional well-being of Malaysians

2 main approaches and activities…

Community outreach roadshows

- Nutrition screening
- Individualised nutrition advice
- Dissemination of nutrition educational materials
- Cooking demonstration

Online nutrition promotion through social media (i.e. Faccebook, Instagram)

- Ask A Nutritionist series (Live chat session with nutritionists)
- NSM Nutritionist's Kitchen (cooking demonstrations)
- NSM Recipe cards (healthy recipes for family cooking)
- Special Events: NSM Virtual Fun Run/Walk, NSM Recipe Books Giveaway
- Variety of nutrition information (NutriQuote; NutriFun Quiz; other infographic nutrition messages)

Contact us: **nsmroadshows@nutriweb.org.my**

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www.nutriweb.org.my

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

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Acknowledgements

The Nutrition Society of Malaysia gratefully acknowledges contributions from the following to the 36th Scientific Conference:

Major Sponsors

- BENEO-Institute
- Herbalife Nutrition
- Malaysian Palm Oil Board
- Yakult (Malaysia) Sdn Bhd

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- International Life Sciences Institute Southeast Asia Region

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- Malaysia Milk Sdn Bhd (Vitagen)

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, 7 SEPTEMBER, 2021

0845 hrs Signing on to ZOOM platform

OPENING & AWARD OF NSM PRIZES

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

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

KEYNOTE LECTURE
Chairperson: Tee E Siong
President, Nutrition Society of Malaysia

1000 hrs **Nutrition interventions to combat NCDs and COVID-19 health threats – experiences in China**
Yang Yue Xin
Chinese Nutrition Society, Beijing, China

1045 hrs **Break / E-poster Viewing / Exhibitor Page Viewing**

SYMPOSIUM 1 : Nutrition and COVID-19
Chairperson : Mahenderan Appukutty
Vice-President, Nutrition Society of Malaysia

1130 hrs **Dietary practices, physical activity and body weight status among Malaysian adults during Movement Control Orders (MCOs): Preliminary findings from the MyNutriLifeCOVID-19 online survey**
Chin Yit Siew
Department of Nutrition, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia

Digital nutrition and health interventions in preventing NCDs and combating COVID-19
Feisul Idzwan Mustapha
Disease Control Division, Ministry of Health Malaysia

1230 hrs **Lunch Break / E-poster Viewing / Exhibitor Page Viewing**

INVITED LECTURE 1
Chairperson : Mohd Redzwan Sabran
Universiti Putra Malaysia

1330 hrs **Effects of tocotrienol-rich fraction (TRF) on the pulmonary fibrosis drug treatment in rat model**
Sun Guiju
Department of Nutrition and Food Hygiene, School of Public Health, Southeast University, Nanjing, China

SYMPOSIUM 2 : Maternal, Infant and Young Child Nutrition
Chairperson : Norimah A Karim
International Medical University

1415 hrs **Empowering parents and community: Efforts to prevent malnutrition among children**
Zalma Abdul Razak
Nutrition Division, Ministry of Health Malaysia

Micronutrient deficiency and supplementation among women of reproductive age
Loh Su Peng
Department of Nutrition, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia

Complementary foods and milk-based formulas provide excess protein but suboptimal key micronutrients and essential fatty acids in the intakes of infants and toddlers from urban settings in Malaysia
Lee Siew Siew
Global Public Health, Jeffrey Cheah School of Medicine and Health Sciences, Monash University Malaysia

YOUNG RESEARCHERS' SYMPOSIUM
Chairperson : Wong Jyh Eiin
Universiti Kebangsaan Malaysia

1515 hrs **Exploring the norms of eating-out practice among adults in Malaysia**
Lydiatul Shima A, Ainaa Almardhiyah AR, Mohd Razif S, Yeong Yeh L, Yee Cheng K, Bibi Nabihah AH, Nor Hamizah S, Raja Affendi RA and Hamid Jan JM
Nutrition and Dietetics Programme, School of Health Sciences, Universiti Sains Malaysia

1530 hrs **Preschoolers' physical activity and sedentary behaviour in relation to social and environmental factors: A mixed method approach study**

Lee ST, Wong JE, Chan Geraldine KL and Poh BK

Nutritional Sciences Programme & Centre for Community Health Studies (ReaCH), Faculty of Health Sciences, Universiti Kebangsaan Malaysia

1545 hrs **Maternal circadian rhythm, chrononutrition and its association with infant growth during the first 6 months of life: results from MY-CARE cohort study**

Teoh AN, Satvinder K, Nurul Husna MS, Siti Raihanah S, Normina AB, Takahashi M, Lim PJ and Shibata S

Department of Food Science with Nutrition, Faculty of Applied Sciences, UCSI University

1600 hrs **Obese yet undernourished – preoperative nutrition status of breast and colorectal cancer patients**

Wong TX, Wong WX, Chen ST, Ong SH, Shyam S, Nurzarina A, Khairul Hazim H, Raflis RA, Mohana Raj T, Mohd Razali I, Kandasami P and Chee WSS

Division of Nutrition & Dietetics, School of Health Sciences, International Medical University

1615 hrs **Preliminary findings of an online Malaysian young children father mother feeding project: Associations of parental feeding factors and child eating behaviours with body weight status among Malaysian young children aged 6-months to 36-months**

Wong HJ, Nurul Aina Amirah MZ, Nur Fatihah MS, Chin YS, Lim PY and Tan CC

Department of Nutrition, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia

FREE PAPER PRESENTATION 1

Chairperson : Gan Wan Ying, Universiti Putra Malaysia & Snigdha Misra, International Medical University

1630 hrs **Reducing anaemia in 36 weeks pregnant mothers**

Ng S, Hanisah A, Koo SJ, Suzee S, Rohana A, Nor Fadilah MS, Amalina MZA, Norhidayah S and Noorhaida U

Bukit Pasir Health Clinic, Muar District Health Office

1640 hrs **Maternal consumption of dairy products during pregnancy reduces the risk of eczema in infants during the first year of life**

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

1650 hrs **Preliminary observations on the dietary intake of Orang Asli Temiar women during the postpartum period**
Sharifah Zahhura SA, Marina AM, Mohamad Insan L, Nurul Jannah A and Salniza Akmar K
Centre for Research on Women and Gender (KANITA), Universiti Sains Malaysia

1700 hrs **Minerals and trace elements contents in breast milk of Malaysian mothers**
Tan SS, Khor GL, Stoutjesdijk E, Ng KWT, Khouw I, Bragt M, Schaafsma A, Dijck-Brouwer DAJ and Muskiet FAJ
Division of Nutrition & Dietetics, School of Health Sciences, International Medical University

1710 hrs **Parental feeding practices in relation to food neophobia among preschoolers in Terengganu, Malaysia**
Alia Izzati A and Wafa SW
Faculty of Health Sciences, Universiti Sultan Zainal Abidin

1720 hrs **Body image and cardiovascular risk factors among Malaysian adolescents**
Haemamalar K , Hazreen AM and Muzalwana AT
Department of Applied Statistics, Faculty of Administration and Economics, Universiti Malaya

1730 hrs **End of Day 1**

CONFERENCE DAY 2: WEDNESDAY, 8 SEPTEMBER, 2021

0845 hrs Signing on to ZOOM platform

FREE PAPER PRESENTATION 2
Chairperson : Tan Sue Yee, Nutrition Society of Malaysia & Anto Cordelia Vijanth, Universiti Tunku Abdul Rahman

0900 hrs **A whole school approach and NuTeen Intervention Program: Impact on secondary school canteen food environment and psychosocial factors of school canteen operators in Kuala Lumpur**
Shashikala S, Vaidehi U and Mirnalini K
Department of Food Science with Nutrition, Faculty of Applied Sciences, UCSI University

0910 hrs **Consumer knowledge, attitude, and practice (KAP) on supplements in relation to COVID-19 pandemic**
Erika Lumbantobing and Siti Muslimatun
Department of Food Science and Nutrition, Faculty of Life Sciences, Indonesia International Institute for Life Sciences (i3L), Jakarta

0920 hrs **Frequency of home cooking is not associated with diet quality among Malaysian adults during the pandemic**
Chew EWL, Chin SY, Misra S, Tan SS, Yang WY and Num KSF
Division of Nutrition and Dietetics, School of Health Sciences, Faculty of Medicine, International Medical University

0930 hrs **The impact of COVID-19 on the consumption of fruits and vegetables in healthy Malaysian adults**
Lo YL, Cheng SH and Lee SS
School of Biosciences, Faculty of Science, The University of Nottingham Malaysia Campus

0940 hrs **Sugar tax in Malaysia: Food industry's response and adolescents' knowledge and attitude towards this tax**
Ng YY, Shyam S, Don R and Hakim SL
Division of Nutrition and Dietetics, School of Health Sciences, International Medical University

0950 hrs **The effect of germinated brown rice on blood glucose, glycated haemoglobin levels and BMI in patients with type 2 diabetes**
Noor Amiza ZA, Faizul HA, Mohd Radzniwan AR, Nizam B, Zetty Nadia MZ and Nuruliza R
Faculty of Medicine and Health Sciences, Universiti Sains Islam Malaysia

INVITED LECTURE 2
Sponsored by Yakult Malaysia
Chairperson : Mahenderan Appukutty
Universiti Teknologi MARA

1000 hrs **Bile acid is a responsible host factor for high-fat diet-induced gut microbiota alterations in rats: Proof of "bile acid hypothesis"**
Atsushi Yokota
Research Faculty of Agriculture, Hokkaido University, Sapporo, Japan

1045 hrs **Break / E-poster Viewing / Exhibitor Page Viewing**

INVITED LECTURE 3
Sponsored by Herbalife Nutrition
Chairperson : Roseline Yap
Nutrition Society of Malaysia

1115 hrs **Precision nutrition and cardiovascular diseases**
José M Ordovás
Tufts University, Boston, United States of America

SYMPOSIUM 3 : School Child and Adolescent Nutrition
Chairperson : Chin Yit Siew
Universiti Putra Malaysia

1200 hrs **Whole grain consumption among children and adolescents**
Koo Hui Chin
Faculty of Applied Sciences, Tunku Abdul Rahman University College

Dietary patterns and cardiometabolic risks among Malaysian adolescents
Geeta Appannah
Department of Nutrition, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia

Implementation of Malaysia School Nutrition Promotion Programme (MySNPP) during the COVID-19 pandemic – experiences and learnings
Teo Choon Huey
Department of Nutrition, Yong Peng Health Clinic, Batu Pahat District Health Office

1300 hrs **Lunch Break / E-poster Viewing / Exhibitor Page Viewing**

INVITED LECTURE 4
Sponsored by the BENEO-Institute
Chairperson : Megan Chong Hueh Zan
International Medical University

1400 hrs **Blood glucose management as a strategy in influencing metabolic health and immunity**
Goh Peen Ern
BENEO-Institute/BENEO Asia Pacific Pte Ltd

SYMPOSIUM 4 : Physical Activity and Sedentary Behaviour
Chairperson : Poh Bee Koon
Universiti Kebangsaan Malaysia

1445 hrs **Physical activity and health-related fitness in adolescents: The Asia-fit study**
Stanley Sai-chuen Hui
The Chinese University of Hong Kong

Physical activity in women
Selina Khoo Phaik Lin
Centre for Sport and Exercise Sciences, Universiti Malaya

Association between recreational physical activity and colorectal cancer with presence of metabolic syndrome and its components: A multicentric hospital-based case control study in Peninsular Malaysia
Vaidehi Ulaganathan
Faculty of Applied Sciences, UCSI University

POSTER FINALISTS PRESENTATIONS
Chairperson : Satvinder Kaur
UCSI University

1600 hrs **Poster finalists presentation**

PRIZE GIVING CEREMONY AND CLOSING
Chairperson : Mahenderan Appukutty
Vice-President,
Nutrition Society of Malaysia

1630 hrs **Prizes presentation**
- Young Researchers' Symposium
- Undergraduates Poster Competition

1700 hrs **Conference end**

POST-CONFERENCE: THURSDAY, 9 SEPTEMBER 2021

MEET THE PRESIDENT OF NSM*
NSM Council Dialogue Session with University Students

1100 hrs **Opening and message by President NSM**
Nutritionists play key roles in the prevention of malnutrition

1130 hrs **Discussion between student participants and NSM council members**
- Presentation of statements by student representatives
- Sharing by all student participants and council members

1230 hrs **Summary and recommendations**

1300 hrs **End of Meet the President session**

**Session is open only for nutrition students of local universities; separate registration required*

MEET THE EDITOR-IN-CHIEF OF MALAYSIAN JOURNAL OF NUTRITION (MJN)**

1430 hrs **Welcome remarks by President NSM**

1435 hrs **About Malaysian Journal of Nutrition: submission guidelines & determinants of manuscript acceptance**
Speaker: Prof Dr Poh Bee Koon, Editor in Chief, MJN

1500 hrs **Manuscript submission to MJN: common errors to avoid**
Speaker: Dr Roseline Yap Wai Kuan, Managing Editor, MJN

1520 hrs **Questions & Answers**

1530 hrs **End of session**

*** Session is open to all conference participants; separate registration required*

Conference Information

SCIENTIFIC PROGRAMME

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

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

- 7 September 2021: 8.45 am – 5.30 pm
- 8 September 2021: 8.45 am – 5.30 pm

General rules using the ZOOM Platform

Please ensure that you have a strong internet connection.

It is suggested to use a good headset to ensure clear audio.

The Zoom webinar platform will "mute" and turn off "webcam video" of all attending participants by default.

Participants will be able to type in their questions using the Q&A icon. Please do not use the Chat function to post your questions. Due to the limitation of time, only selected questions shall be addressed during any Q&A session.

SCIENTIFIC POSTER EXHIBITION

All scientific posters are available on a section called, "Scientific Posters" in the NSM Conference 2021 Website: https://www.nsmconference.org.my/scientific-posters/

TRADE EXHIBITION

Trade exhibition is available on a section called "Virtual Exhibition" in the NSM Conference 2021 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 and uploaded on the conference website within 14 working days after the Conference (by 1st October 2021). Participants will need to download from the website following the instruction given on the website later. Special certificates will be given to those who participated in the Young Researcher's Symposium, Free Paper Presentation sessions and Poster Exhibitions.

FOR PRESENTERS

Kindly turn on your webcam and unmute yourself when the Chairperson introduces you and invites you to start your presentation, or during the Q&A session. At other times, please turn off our webcam and mute the microphone.

It is suggested that you 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 Secretariat/Panelist members.

NSM Prizes 2021

NSM Postgraduate and Undergraduate Prizes 2021

Two types of NSM Prizes are awarded under the Education Fund of the Nutrition Society of Malaysia, according to the Bye-Laws of the Society. The NSM Postgraduate Prize is awarded for a thesis accepted for a PhD or MSc degree whereas the Undergraduate Prize is awarded for a thesis accepted for a basic/first degree. Each prize comprises a cash award and a certificate, as follows: RM1,000 for a PhD thesis, RM750 for MSc thesis and RM500 for the undergraduate prize.

In 2021, NSM is awarding six Postgraduate Prizes; four for PhD and two for MSc, with a total cash award of RM5,500. Eight undergraduates receive Undergraduate Prizes with a total cash award of RM 4,000. The total cash award for both categories of thesis prizes this year is RM9,500.

The recipients for the PhD thesis prize are:

1. **Dr Wirdah Mohamed**
   The effect of F.E.A.T. (Fit, Eat, Active, Training) intervention programme for weight reduction among adults in Masjid Tanah, Melaka
   Supervisor: *Prof Dr Ruzita Abd Talib*
   Co-supervisor(s): *Prof Dr Poh Bee Koon, Dr Nor Farah Mohd Fauzi, Dr Norhayati Ibrahim*
   University: *Faculty of Health Sciences, Universiti Kebangsaan Malaysia (UKM)*

2. **Dr Lee Siew Siew**
   Maternal and neonatal vitamin d deficiency, vitamin D-related gene polymorphism and birth outcomes
   Supervisor: *Assoc Prof Dr. Loh Su Peng*
   Co-supervisor(s): *Assoc Prof Dr Ling King Hwa, Dr Maiza Tusimin, Dr Raman Subramaniam, Dr Kartini Farah Rahim*
   University: *Faculty of Medicine and Health Sciences, Universiti Putra Malaysia (UPM)*

3. **Dr Norliyana Binti Aris**
   Risk factors of vitamin d deficiency and the effects of sunlight exposure and vitamin D supplementation on serum vitamin D level, adiponectin, and cardiometabolic risk factors among adults in Kelantan
   Supervisor: *Prof Dr Hamid Jan Bin Jan Mohamed*
   Co-supervisor(s): *Prof Dr Wan Abdul Manan bin Wan Muda*
   University: *School of Health Sciences, Universiti Sains Malaysia (USM)*

4. **Dr Ng Choon Ming**
   KIDCHEN study: an experiential culinary nutrition education programme to improve nutritional outcomes among children in Kuala Lumpur, Malaysia
   Supervisor: *Asst Prof Dr Satvinder Kaur D/O Nachatar Singh*
   Co-supervisor(s): *Dr Koo Hui Chin (TAR-UC), Dr Roseline Yap Wai Kuan, Assoc Prof Dr Yim Hip Seng*
   University: *Faculty of Applied Sciences, UCSI University*

The recipients for the MSc thesis prizes are:

1. **Eow Shiang Yen**
   Factors associated with autism severity in children with autism spectrum disorder at an autism intervention center in Kuala Lumpur, Malaysia
   Supervisor: *Assoc Prof Dr Gan Wan Ying*
   Co-supervisor(s): *Prof Dr Zalilah Mohd Shariff, Assoc Prof Dr Hamidin Awang, Dr Lim Poh Ying*
   University: *Faculty of Medicine and Health Sciences, Universiti Putra Malaysia (UPM)*

2. **Wong Soon Yee**
   Validation and reproducibility of a calcium and vitamin D Food Frequency Questionnaire (FFQ) among Malaysian pre-adolescent children
   Supervisor: *Prof Dr Winnie Chee Siew Swee*
   Co-supervisor(s): *Dr Ong Shu Hwa, Dr Yang Wai Yew*
   University: *School of Health Sciences, International Medical University (IMU)*

The recipients for the Undergraduate thesis prizes are:

1. **Lai Loke Yee**
   Accuracy of self-reports to assess food intakes among primary school children aged 7-9 years
   Supervisor: *Dr Wong Jyh Eiin*
   University: *Faculty of Health Sciences, Universiti Kebangsaan Malaysia (UKM)*

2. **Nuruljannah Binti Mohamad Nasri**
   Determination of carbohydrate composition in breastmilk and its association with infant's growth and behaviour
   Supervisor: *Dr Nurul Husna Mohd Sukri*
   Co-supervisor(s): *Dr Siti Raihanah Binti Shafie*
   University: *Faculty of Medicine and Health Sciences, Universiti Putra Malaysia (UPM)*

3. **Wan Nurzakirah Binti Wan Abas**
   Association between health literacy, sociodemographic and socioeconomic factors with body mass index (BMI) among secondary school students in Kota Bharu, Kelantan
   Supervisor: *Dr Rohani Ismail*
   University: *School of Health Sciences, Universiti Sains Malaysia (USM)*

4. **Anis Farahin Binti Mat Wahi**
   Validity and reliability of web based interactive dietary assessment tool among university students in UniSZA
   Supervisor: *Dr Mohd Razif Shahril*
   University: *Faculty of Health Sciences, Universiti Sultan Zainal Abidin (UniSZA)*

5. **Oeh Zhe Yee**
   Development and validation of semi-quantitative food frequency questionnaire to assess school food intake and its association with weight status among Aboriginal children in Negeri Sembilan, Malaysia
   Supervisor: *Dr Vaidehi Ulaganathan*
   University: *Faculty of Applied Sciences, UCSI University*

6. **Marissa Maniesewad**
   Assessment of diet quality, physical activity and weight status among students of Program Pendidikan Khas Integrasi (PPKI) in Selangor
   Supervisor: *Ms Sarina Sariman*
   University: *Faculty of Health and Life Sciences, Management & Science University (MSU)*

7. **Chin Yu Qiong**
   Dietary patterns of Malaysian adults: energy, nutrient intakes and environmental impact
   Supervisor: *Assoc Prof Dr Soma Mitra*
   University: *Faculty of Science and Engineering, University of Nottingham Malaysia*

8. **Ng Xin Qian**
   Colonic fermentation of Isomaltulose in healthy Malaysian adults: a single-blind, randomised crossover pilot trial
   Supervisor: *Dr Megan Chong Hueh Zan*
   Co-supervisor(s): *Dr Sangeetha Shyam, Dr Tan Seok Shin*
   University: *School of Health Sciences, International Medical University (IMU)*

NSM Publication Prize 2021

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 2021, two Corporate Members of NSM have supported this initiative, namely Fonterra Brands (M) Sdn Bhd (C 1879) and Herbalife Nutrition (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 Nutrition 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; Promotion of Healthy Eating and/or Physical Activity; 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 2021, 4 applications (with five papers) were received for this category sponsored by Fonterra Brands Sdn Bhd. The Selection Committee decided to award the prize to three applicants, with the following details:

Name of recipient:	***Lee Siew Siew*** [O 2050] Global Public Health, Jeffrey Cheah School of Medicine and Health Sciences, Monash University Malaysia
Publication:	Influence of vitamin D binding protein polymorphism, demographics and lifestyle factors on vitamin D status of healthy Malaysian pregnant women *BMC Pregnancy and Childbirth (2020) 20:714* *https://doi.org/10.1186/s12884-020-03397-7*
Name of recipient:	***Muliana Binti Edi*** [O 2335] Department of Nutrition, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia
Publication:	Inadequate gestational weight gain and exposure to second-hand smoke during pregnancy increase the risk of low birth weight: a cross-sectional study among full-term infants *International Journal of Environmental Research and Public Health* (2021) 18: 1068 *https://doi.org/10.3390/ijerph18031068*

Name of recipient:	***Yong Heng Yaw*** [L 1742] Department of Nutrition, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia
Publication:	Pre-pregnancy BMI influences the association of dietary quality and gestational weight gain: the SECOST study *International Journal of Environmental Research and Publication Health* (2019) 16: 3735. *https://doi.org/10.3390/ijerph16193735*

NSM Publication Prize: Dairy Nutrition

For the year 2021, no application was received for this category sponsored by Fonterra Brands Sdn Bhd.

NSM Publication Prize: Mobility and Musculoskeletal Health and Nutrition

For the year 2021, two 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:	***Koo Hui Chin*** [L 2010] Tunku Abdul Rahman University College
Publication:	Bone health and its positive relationships with body composition in Malaysian schoolchildren: findings from a cross sectional study *Children* (2021) 8(7): 569. *https://doi.org/10.3390/children8070569*

NSM Publication Prize: Functional Foods & Healthy Ageing

For the year 2021, only one application was received for this category sponsored by Herbalife Nutrition. The Selection Committee decided to award the prize to the applicant with the following details:

Name of recipient:	***You Yee Xing*** [O 2556] Dietetics Programme, Faculty of Health Sciences, Univesiti Kebangsaan Malaysia
Publication:	Effects of 12 weeks Cosmos caudatus supplement among older adults with mild cognitive impairment: A randomized, double-blind and placebo-controlled trial *Nutrients* (2021) 13(2): 434. *https://doi: 10.3390/nu13020434*

NSM Publication Prize: Promotion of Healthy Eating and/or Physical Activity

For the year 2021, one application was received for this category sponsored by Herbalife Nutrition. The Selection Committee decided not to award the prize to this applicant.

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

For the year 2021, no application was received for this category sponsored by Herbalife Nutrition.

NSM Publication Prize: Soya protein and Health Benefits

For the year 2021, no application was received for this category sponsored by Herbalife Nutrition.

NSM Young Researchers' Symposium Prizes 2021

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

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

Prizes for 2021, totalling RM1,100 are provided by International Life Sciences Institute (ILSI) Southeast Asia Region.

NSM Poster Competition Prizes 2021

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
7 Consolation Prizes of RM50 each

Prizes for 2021, totalling RM800 are provided by International Life Sciences Institute (ILSI) Southeast Asia Region.

Announcements
NSM Publication Prizes 2022

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 2019-2022, 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 37th Scientific Conference of the Nutrition Society of Malaysia in 2022. Winners shall be invited to attend the ceremony 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 applications shall be announced in 2022; do check out in Nutriweb.

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 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 2018 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 September 2021

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 2019-2022, 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 37th Scientific Conference of the Nutrition Society of Malaysia in 2022. Winners shall be invited to attend the ceremony 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 applications shall be announced in 2022; do check out in Nutriweb.
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:

      i. Name
      ii. NSM membership number
      iii. Address of work place
      iv. 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 deadline stated.

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 2018 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 September 2021

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 2019-2022, 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 37th Scientific Conference of the Nutrition Society of Malaysia in 2022. Winners shall be invited to attend the ceremony 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 applications shall be announced in 2022; do check out in Nutriweb.
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:

       i. Name
       ii. NSM membership number
       iii. Address of work place
       iv. 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 deadline stated.

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 2018 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 September 2021

4. Health Benefits of Dietary Fibre

Members of the Nutrition Society of Malaysia (NSM) are invited to apply for the NSM Publication Prize: Roles of Dietary Fibre in Health.

Objective:

To encourage and promote local research publications in the field of Roles of Dietary Fibre in Health.

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 Nutrition.

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 37th Scientific Conference of the Nutrition Society of Malaysia in 2022. Winners shall be invited to attend the ceremony 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 applications shall be announced in 2022; do check out in Nutriweb.
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 the roles of dietary fibre in human health in the context of the 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 2018 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.

3 September 2021

5. Promotion of Healthy Eating and/or Physical Activity

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

Objective:

To encourage and promote local research publications in the field of Functional Foods and 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 Nutrition.

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 37th Scientific Conference of the Nutrition Society of Malaysia in 2022. Winners shall be invited to attend the ceremony 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 applications shall be announced in 2022; do check out in Nutriweb.
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 and healthy ageing in the context of the 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 2018 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.

3 September 2021

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 to Enable a Healthy Lifestyle Change.

Objective:

To encourage and promote local research publications in the field of Community Support to Enable a Healthy Lifestyle Change.

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 Nutrition.

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 37th Scientific Conference of the Nutrition Society of Malaysia in 2022. Winners shall be invited to attend the ceremony 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 applications shall be announced in 2022; do check out in Nutriweb.
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 Community Support to Enable a Healthy Lifestyle Change in the context of the 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.

3 September 2021

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 Nutrition.

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 37th Scientific Conference of the Nutrition Society of Malaysia in 2022. Winners shall be invited to attend the ceremony 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 applications shall be announced in 2022; do check out in Nutriweb.
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 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 2018 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.

3 September 2021

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 10 posters put up by undergraduates shall be awarded cash prizes!

Poster Presentation

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

A01 Association between maternal factors with children's health-related quality of life (HQOL) among households living in People's Housing Program (PHP) Klang Valley, Malaysia
Asrawati Awalina A, Norhasmah S and Zalinda Z

A02 Nutritional status and quality of life among Malaysian elderly who practise Qigong
Cheong ST and Wong JE

A03 Association of dietary glycemic index and dietary glycemic load with body fat among aboriginal children in Negeri Sembilan
Chieng GWN, Vaidehi U, Silambarasi K, Eng ZYE, Lim LS, Tay JL, Divanirsh D, Tan LX and Oeh ZY

A04 Dietary Inflammatory Index and obesity among aboriginal primary school children in Negeri Sembilan
Eng ZYE,Vaidehi U, Lim LS, Grace Chieng WN, Tay JL, Dianirsh D, Tan LX, Oeh ZY and Silambarasi K

A05 Factors associated with sedentary behaviour among university students
Farah Raihana G and Hazizi AS

A06 Associations between socio-demographic, body mass index, body image perception, physical activity and sleep quality with mental health among university students in Universiti Putra Malaysia
Farrah Haliny K and Noraida O

A07 Factors associated with disordered eating among undergraduate students of Universiti Putra Malaysia during movement control order
Irdina Farahani S, Jun Hao L and Zulfitri Azuan MD

A08 Nutritional related factors and its association with delayed sputum smear conversion among Pulmonary Tuberculosis Patients in Kota Kinabalu, Malaysia
Khalid M, Zaleha MI, Halim I, Julaidah S and Firdaus MH

A09 Knowledge, attitude and practices on malnutrition among caregivers of the post discharge older adults in Klang Valley
Khoi ZY and A. Siti Nur'Asyura

A10 Darkness and screen light exposure: Its role in psychosocial factors among pregnant women in Kuala Lumpur
Kok EY, Chew WL and Satvinder K

A12 Healthy eating index and abdominal obesity among aboriginal children in Negeri Sembilan
Lim LS, Ulaganathan V, Kuralneethi S, Eng ZYE, Chieng GWN, Tay JI, Devindran D, Tan LX and Oeh ZY

A13 Association between body image dissatisfaction and eating disorder among UCSI University students
Low KKW and Shashikala S

A14 Association between community and consumer food environment with Body Mass Index (BMI) status among adolescents aged 13 to 17 years in Sandakan, Sabah
Mohammad Noor Hisham H and Nurzalinda ZZ

A15 Association between stress level, sleep quality and eating behaviours among university students
Ng JJ and Shashikala S

A16 An online survey of association of sociodemographic factors and nutritional status with type 2 diabetes risk among a sample of Malaysian adults
Ng PW, Barakatun Nisak MY, Chiang WL and Farah Yasmin H

A17 Assessment of availability of sport facilities and recreational resources in a state of Penang
Ng YH and Foo LH

A18 The associations of knowledge on nutrition, attitude on gestational weight gain, cultural beliefs (food taboos) practice with gestational weight gain among Malay pregnant women in Malaysia
Nor Ashiqin R and Zalbahar N

A19 The relationship of food vlog viewing on social media with food cravings among youths
Nor Atikah Aina NA and Sameeha MJ

A20 Psychosocial factors as mediators to the relationship between food security status and academic performance among undergraduate students in Universiti Putra Malaysia
Nor Syaza Sofiah A, Norhasmah S and Sabri MF

A21 Socio-demographic characteristics, nutritional knowledge, and perception of Front-of-Pack labels among university students
Norsyahiera Atika Z

A22 Factors associated with stunting among 2- to 5-year-old urban poor children living in low cost-flats at Kuala Lumpur
Nur Aida Aryani MR, Nurafiqah A and Gan WY

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B40 Healthy food choices in school canteen: psychosocial factor of secondary school students in Malaysia
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C03 Comparative antioxidant contents, antioxidant activity, and mineral contents of fresh and fermented leaves of Cleome gynandra
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C18 Nutritional composition and antioxidant activities of selected popularly consumed local and imported herbs
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C19 Total phenolic content, total flavonoid content and antioxidant capacity of 80% ethanol and water extract from white mulberry (Morus alba) fruits, leaves and stems
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D02 The effects of taste sensitivity and repeated taste exposure on children's intake and liking of a bitter vegetable
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E02 Food safety and hygiene knowledge, attitude and practices among food handlers at food factories in Pontian, Johor during COVID-19
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E03 Sensory evaluation of castella cake made with isomaltulose
Ho SJY, Tan SS, Shyam S and Megan CHZ

E04 Nutritional and fatty acid profiles in beef patty formulated with brown rice and rice bran oil
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E05 Sodium caseinate edible film incorporated with Bifidobacterium breve M-16V
Lam B and Liew PP

E06 Development and sensory evaluation of burnt cheesecake made with sucrose and isomaltulose
Lee JP, Tan SS, Shyam S and Megan CHZ

E07 Physicochemical properties of Kelulut honey adulterated with different percentages of rice syrup
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E08 Determination of anti-nutrients content before and after heat treatment in selected underutilised leguminous plants in Malaysia
Nurul Amira HN and Norhaizan ME

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*IMO: Institute of Medicine of the National Academies, USA.

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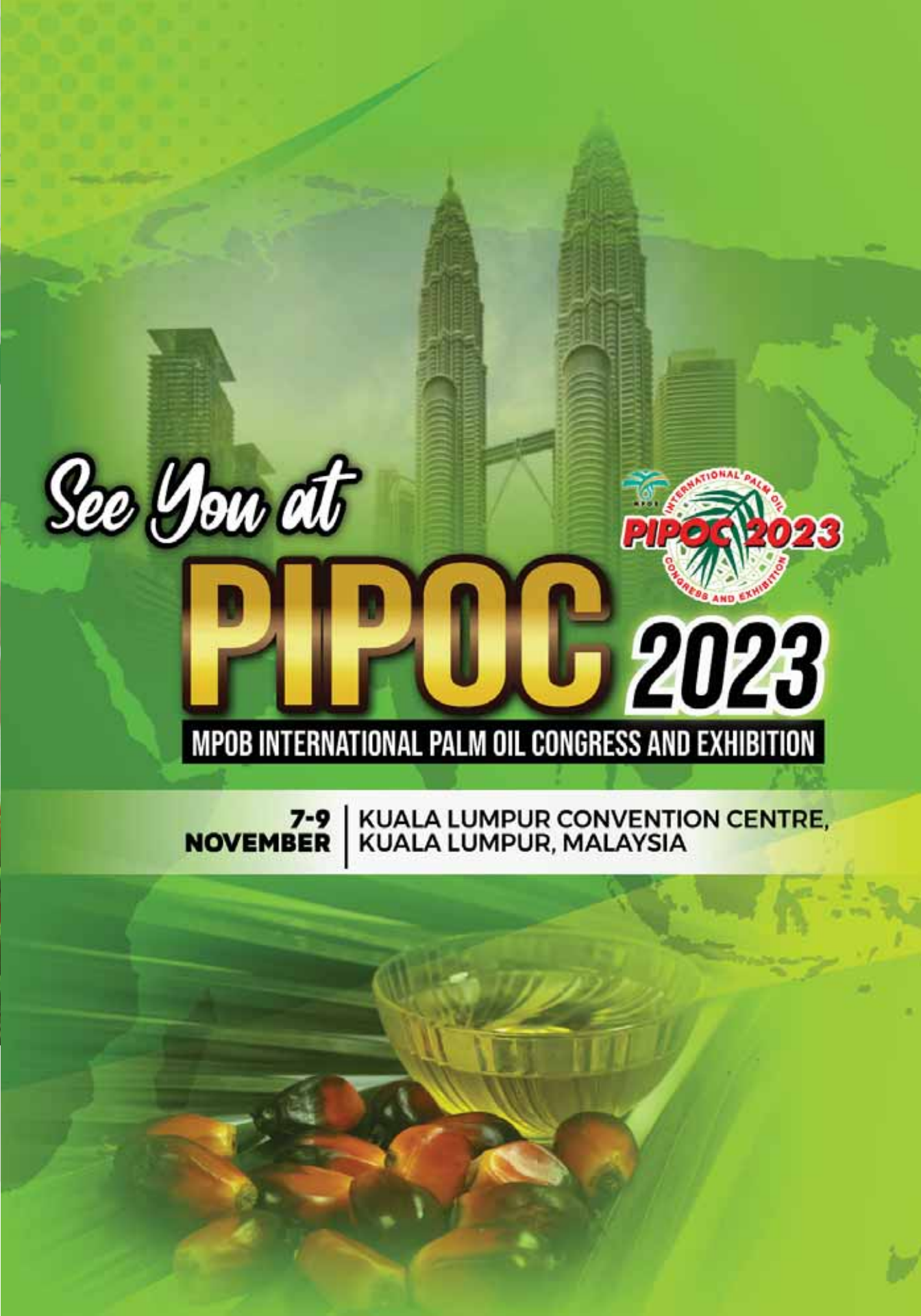
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Abstracts

Keynote Lecture

Nutrition interventions to combat NCDs and COVID-19 health threats – experiences in China

Yang YX

Chinese Nutrition Society

Nutrition and health care are the most efficient and cost-effective ways to prevent chronic diseases. This report summarizes the China's nutrition policy environment and governance, implementation and actions of a series of food and nutrition policies, standards and regulations for nutrition labelling, actions specific to reduction of salt, fat, and sugar, as well as actions and measures of nutrition related chronic diseases prevention and control. At present, dietary related chronic diseases accounts for more than 70% of the total disease are become the main causes of death of Chinese people. Such as cardiovascular and cerebrovascular diseases, the prevalence of hypertension among Chinese residents over 18 years old is 25.2%, and dyslipidemia is 40.4%; About 42% of adults and 16% of children and adolescents in China are obese or overweight. Even more worrying is these chronic diseases prevalence is continue rising.

Recent national healthy policies, such as "Outline of the Healthy China 2030 Plan" and "Healthy China Action Plan (2019–2030)," sets a series of actions and goals that point out direction to China's nutrition policy improvement in the next decade. China has carried out a series of actions to reduce salt, fat, and sugar intake for achieving a healthy diet. Such as the "Guidelines for Salt Reduction in China's Food Industry," put forward the phased goals and strategies to achieve salt reduction in the food industry. The revision of labeling regulations, and the labeling specification for healthier choice in prepackaged food "Front-of-Pack" research, are expected to realize the embodiments of the reduction of salt, oil, and sugar intake. Further improvements and efforts on nutrition diet and the control of chronic disease risk factors are essential for in depth policy support.

In addition, since covid 19 impact all-over the world, China has been committed to fighting covid 19 in many aspects. Dietary also a method not only to treat recovery patient but also maintain and enhance the body immune system in order to resist virus infection. Chinese Nutrition Society published dietary guideline Covid-19 version to guide people how to maintain a balance diet during the city restriction time. The challenges and prospects of nutrition policies and actions pave a path for future policy-making and chronic diseases prevention to successfully achieve Healthy China 2030.

Dietary practices, physical activity and body weight status among Malaysian adults during Movement Control Orders (MCOs): Preliminary findings from the MyNutriLifeCOVID-19 online survey

Chin YS [1,2], ***Lim PY*** [3], ***Nor Baizura MY*** [4], ***Appukutty M*** [5] ***and Chan YM*** [2,4]

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The numbers of daily confirmed COVID-19 cases and deaths have continued at increasing trend despite Malaysia being under certain forms of movement control orders (MCOs) over the past one year. Although the lockdown is necessary to prevent further spread of the disease, prolonged home confinement during COVID-19 pandemic could have led to dramatic changes in lifestyle behaviours of the population and subsequent changes in body weight and overall health status. The MyNutriLifeCOVID-19 study, that aimed to determine the nutrition and lifestyle changes, were conducted at two phases of MCOs, namely MCO 1.0 and MCO 2.0. A total of 1,337 Malaysian adults participated in the Phase I of the study (Year 2020: MCO 1.0), while 1,401 Malaysian adults participated in the Phase II of the study (Year 2021: MCO 2.0) during COVID-19 pandemic. The data on dietary practices, physical activity, body weight status and perceived health status before and during the COVID-19 lockdowns were self-reported by the respondents via a set of standardized online questionnaire. A majority of the respondents were females and Malays, while respondents of Phase II of the study (34.5±11.0 years) were slightly younger than those from Phase I of the study (36.3±11.3 years). Although majority of the respondents from both phases of the study perceived no difference in their health status during MCOs, more respondents perceived changes in their health status during MCO 2.0 as compared to MCO 1.0 (Better health: Phase I: 14.5%; Phase II: 16.1%; Poorer health: Phase I: 8.3%; Phase II: 11.6%). Body weight and body mass index (BMI) were comparable between respondents from Phase 1 and II of the study before MCO. Findings from both phases of the study showed significant changes of their body weight during MCOs, whereby more respondents at Phase II of the study (42.4%) reported that their body weight had increased during lockdowns while 37.1% of the respondents from the Phase I of the study reported no weight changes during lockdowns (χ^2=60.9, p<0.001). In addition, dietary practices and physical activity were found to be different between Phase I and Phase II of the study. However, both dietary practices and physical activity were consistently associated with body weight changes for both phases of the study. In summary for this preliminary study, Malaysian adults experienced changes in their dietary practices and physical activity during MCOs, which were associated with significant body weight changes. Considering overweight and obesity problem was prevalent even before lockdowns, health care professional, namely nutritionists and dietitians, should not neglect the influence of lockdowns whereby healthy lifestyle promotion should be implemented to Malaysians to reduce risks associated with increased body weight.

Digital nutrition and health interventions in preventing NCDs and combating COVID-19

Feisul Idzwan M

Disease Control Division, Ministry of Health Malaysia

Optimising determinants of health is key in battling NCDs – the greatest challenge for health systems around the world in the next half a century, at least. Now more than ever, we spend most of our time with one digital interface or another. This has led to a proliferation of interests in using digital solutions to determine and alter our daily behaviours, hoping to ultimately lead to healthier lifestyle choices.

COVID-19 has provided a unique opportunity to amplify this trend. Whilst the task ahead is massive and complex, we need to remind ourselves of three crucial things – one, applying what we already know about human behaviour; two the bigger picture of our health ecosystem; and three, that these interventions must not further widen existing disparities. These three lessons will help empower us to successfully navigate ourselves through the right path in our endeavours.

Invited Lecture 1

Effects of tocotrienol-rich fraction (TRF) on the pulmonary fibrosis drug treatment in rat model

Lu YF and Sun GJ

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In December, 2019, reports emerged from Wuhan, China, of a severe acute respiratory disease caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). By the end of April, 2020, over 3 million people had been confirmed infected, with over 1 million in the USA alone, and over 215 000 deaths. The spread of the epidemic is not even over today. The major risk factors for severe COVID-19 are shared with idiopathic pulmonary fibrosis (IPF), namely increasing age, male sex, and comorbidities such as hypertension and diabetes. Which contributes to more articles starting to think about the potential link between COVID-19 and pulmonary fibrosis. Pulmonary fibrosis is a multifaceted disease with high mortality and morbidity, and it is commonly nonresponsive to conventional therapy.

We explore the possible discourse of tocotrienol rich fraction (TRF) and carotene against the prevention of bleomycin (BLM)-instigated lung fibrosis in rats through modulation of TGF-β1/Smad pathway.

Lung fibrosis was persuaded in Sprague-Dawley rats by a single intratracheal BLM (5mg/kg) injection. Then, these rats were treated with TRF (50 ,100 and 200 mg/kg/D), Carotene (10 mg/kg/D) and TRF (200 mg/kg/D) c combined with Carotene (10 mg/kg/D) for 28 days. The normal control rats provided saline as a substitute of BLM. The lung function and biochemical, histopathological, and molecular alterations were studied in serum, bronchoalveolar lavage fluid (BALF), and the lungs tissues.

TRF and carotene treatments significantly restored BLM-induced alterations in antioxidant and anti-inflammatory function. The treatment appeared to show a pneumoprotective effect through upregulation of antioxidant status, downregulation of inflammatory cytokines and MMP-7 expression, and reduction of collagen accumulation (hydroxyproline). TGF-β, Smad2, Smad3, Smad7 and α-SMA expression was upregulated in BLM-induced fibrosis model, while the increased expression levels were significantly and dose-dependently downregulated by TRF (50, 100 and 200 mg/kg/D) treatment in the high probability. We demonstrated that TRF and carotene ameliorates BLM-induced lung injuries through inhibition of apoptosis and induction of TGF-β1/Smad pathway. The histopathological findings also revealed that TRF and Carotene treatment significantly ameliorated BLM-induced lung injury.

The present results showed the ability of TRF and carotene to restore the antioxidant system and to inhibit oxidative stress, proinflammatory cytokines and TGF-β.

Symposium 2: Maternal, Infant and Young Child Nutrition

Empowering parents and community: Efforts to prevent malnutrition among children

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Children need a supportive environment to ensure their optimal growth. Normal growth is a sign of good health and well-being in children. Therefore, routine growth monitoring is essential to detect any abnormality in early childhood and prevent malnutrition. A successful response to malnutrition requires a life course approach involving the whole community in various ways, not just health. However, parents' knowledge and skills in managing child's nutrition and health are crucial in addressing this issue. Few initiatives implemented by the Ministry of Health Malaysia and various stakeholders will be highlighted in the presentation.

Micronutrient deficiency and supplementation among women of reproductive age

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Women's micronutrient requirements are an area of great interest because meeting the required status before, during, and after pregnancy is essential in reproductive health. Various micronutrient deficiencies often exist among women of reproductive age, especially in low- to middle-income countries, including Malaysia. In this presentation, we will discuss some widespread micronutrient deficiencies common among women of reproductive age. Improvements in diet quality are essential to address these issues. However, dietary

supplements and/or food fortification could help meet requirements for women at risk of deficiencies. Various forms of supplementation, either single or multiple-micronutrients have been recommended especially for pregnant women because of the evidence of impact on pregnancy outcomes. Here, we provide an overview of some research using various dietary supplements and their outcome on micronutrient status.

Complementary foods and milk-based formulas provide excess protein but suboptimal key micronutrients and essential fatty acids in the intakes of infants and toddlers from urban settings in Malaysia

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This study determined the intakes of complementary foods (CFs) and milk-based formulas (MFs) by a total of 119 subjects aged 6–23.9 months from urban day care centers. Dietary intakes were assessed using two-day weighed food records. Intake adequacy of energy and nutrients was compared to the Recommended Nutrient Intakes (RNI) for Malaysia. The most commonly consumed CFs were cereals (rice, noodles, bread). The subjects derived approximately half of their energy requirements (kcals) from CFs (57±35%) and MFs (56±31%). Protein intake was in excess of their RNI requirements, from both CFs (145±72%) and MFs (133±88%). Main sources of protein included meat, dairy products, and western fast food. Intake of CFs provided less than the RNI requirements for vitamin A, thiamine, riboflavin, folate, vitamin C, calcium, iron, and zinc. Neither CF nor MF intake met the Adequate Intake (AI) requirements for essential fatty acids. These findings indicate imbalances in the dietary intake of the subjects that may have adverse health implications, including increased risk of rapid weight gain from excess protein intake, and linear growth faltering and intellectual impairment from multiple micronutrient deficiencies. Interventions are needed to improve child feeding knowledge and practices among parents and child care providers.

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Young Researchers' Symposium

Exploring the norms of eating-out practice among adults in Malaysia

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Eating-out is a common occasion in almost all countries including Malaysia, but this frequent practice may affect human health. In Malaysia, data on eating-out is limited. This study aimed to assess the proportion of eating out, to assess the association between socio-demographic factors and eating patterns and to compare energy and nutrients intakes between people eating-out and eating-in. This cross-sectional study was conducted among 100 adults aged 30 to 70 years old. Three-day food diaries were used to collect data on dietary intake. Eating-out is defined as eating foods prepared outside the home. Respondents who eat outside for at least one meal per day, for two or three days were considered as those who frequently practice eating-out. A total of 84% of our respondents eating-out had significantly higher sodium intake than those who eat at home (2933.56 mg/day vs. 2165.00 mg/day, p=0.025). Foods and drinks that were mostly consumed outside are *nasi lemak*, *roti canai*, rice, *ayam masak kicap*, vegetable soup, *tomyam*, rice vermicelli soup (*mee-hoon soup*), hot *teh-o*, iced tea and orange juice. Occupation (p=0.004) and location type (p=0.001) were associated with eating-out. Government and semi-government population (61%) and urban population (57%) had a higher percentage of eating-out compared to eating at home (19% and 12% respectively). More than two-thirds of our respondents were eating-out and this habit is related to poor diet quality with excessive intake of sodium. More interventions are needed to improve diet quality of the overall eating-out behaviour among targeted population.

Preschoolers' physical activity and sedentary behaviour in relation to social and environmental factors: A mixed method approach study

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High physical activity and low sedentary behaviour are important for childhood development and well-being. These behaviours have not been extensively investigated among preschoolers in Malaysia. Using mixed-method approach, this study aims to determine preschoolers' physical activity and sedentary behaviour, and related social and environmental factors. The study was conducted in two phases. In Phase I, in-depth interviews conducted among 20 parents and 8 teachers of preschoolers revealed that the main motivators of active play were support from parents, peers and teachers. Barriers to being active were availability of screen equipment and lack of playground safety, while screen time was influenced by parental media practices. In Phase II, 230 children aged 4 to 6 years were recruited. Physical activity and sedentary behaviour were assessed using Actical accelerometers, while screen time and sleep pattern were parent proxy-reported. On average, children spent 5.5±1.4 hours/day, 1.0±0.4 hour/day, 6.8±1.1 hours/day, 3.0±1.5 hours/day and 9.5±1.3 hours/day, respectively, on total physical activity, moderate-vigorous physical activity (MVPA), sedentary behaviour, screen time and sleep. Only 6.5% preschoolers met all three MVPA, screen and sleep guidelines. Multivariate regression model showed that parental inability to support children in active play (β=-5.5; 95%CI: -9.7, -1.2) and children's

body constraints (β=-5.7; 95%CI: -10.3, -1.0) reduced MVPA. Paternal modelling reduced sedentary behaviour (β=-35.0; 95%CI: -54.3, -15.7) while children who preferred screen activities more than active play had increased screen time (β=20.5; 95%CI: 3.9, 37.2). The mixed-method approach guided deductive (quantitative) and inductive (qualitative) research strategies; hence, an in-depth comprehensive understanding of the influence of social and environmental factors on preschoolers' physical activity and sedentary behaviour is achieved. In conclusion, social factors particularly parental support and parenting practices are important in shaping preschoolers' physical activity and sedentary behaviour. These findings will be useful for designing effective programmes that aim to inculcate active lifestyle among young children.

Maternal circadian rhythm, chrononutrition and its association with infant growth during the first 6 months of life: Results from MY-CARE cohort study

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Disrupted circadian rhythm due to shift work, transmeridian travel and sleep disorder has been linked to higher risk of adverse birth outcomes. However, the impact of maternal circadian rhythm on infant growth is underexplored. This prospective cohort study aimed to determine circadian rhythm during pregnancy and its association with chrononutrition and infant growth during the first 6 months of life among 168 healthy primigravidas. A subsample (n=70) provided salivary samples at 4 time-points over 24h for melatonin and cortisol assay. Morningness-Eveningness Questionnaire (MEQ) and Pittsburgh Sleep Quality Index (PSQI) were used to assess the chronotype and sleep quality of pregnant women, respectively. The components of chrononutrition including meal timing, frequency, eating window, breakfast skipping, night eating, and macronutrient distribution were assessed using a 3-day food record. Infant's anthropometric data was collected at 1, 3, and 6 months from clinic record. Eveningness was significantly associated with breakfast-skipping during the second (*OR*=0.910, *p*=0.010) and third trimester (*OR*=0.879, *p*=0.003). Breakfast-skipping predicted a flatter diurnal cortisol slope only during the second trimester (β=0.308, *p*=0.019). Higher energy intake during the earlier part of the day from 7:00-11:00h (β=-0.502, *p*=0.004) and 12:00-15:00h (β=-0.376, *p*=0.039) was significantly associated with a lower mean melatonin level across the day during the third trimester. Overall, a reduced Δchange in mean melatonin level across gestation was associated with greater Δchange in eating window (β=-0.525, *p*<0.001). In the adjusted mixed model, eveningness and reduced Δchange in total melatonin secretion across gestation were significantly associated with a lower weight-for-age Z-score from 1 to 6 months of age (*p*=0.003 and *p*=0.047). Findings suggest that suboptimal chrononutrition characteristics was associated with maternal chronotype and reduced melatonin secretion across gestation, which may reduce infant weight gain in the first 6 months of life. Maternal circadian rhythm, particularly melatonin may have important implication on infant growth.

Obese yet undernourished – preoperative nutrition status of breast and colorectal cancer patients

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The incidence of cancer is increasing in Malaysia. A total of 48,639 new cancer cases was reported in 2020 and cancers were amongst the top five causes of deaths locally. Despite being overweight or obese upon diagnosis, studies showed that following the trajectory of the disease and surgery, these patients exhibited weight loss and malnutrition, which pose risk of postoperative complications and poor disease prognosis. Therefore, this study aims to assess the preoperatively nutritional status robustly, including handgrip strength and body composition of patients. A cross sectional study among 91 patients diagnosed with breast or colorectal cancer were recruited from 2 tertiary government hospital. Preoperative nutritional status was determined based on the AND/ASPEN criteria which included body mass index, weight change, fat mass, muscle mass and handgrip strength. Handgrip strength was measured using hand dynamometer. Body composition was determined using multifrequency bioelectrical impedance analysis. The dietary intake was collected using diet history over 1 week. The study found that 51% of patients were overweight or obese based on their BMI. However, 65% of patients were classified as moderate to severe malnutrition fulfilling at least 2 criteria using the AND/ASPEN tool. Moreover, 29% of patients reported significant weight loss, 90% of patients present with low skeletal muscle index below the cut off values and 7% had sarcopenic obesity. About 79% of the patients reported daily energy intake below 25kcal/kg and 90% of the patients reported daily protein intake below 1.2g/kg. Preoperatively, these patients were at risk of malnutrition given the high prevalence of significant involuntary weight loss, sarcopenic obesity and poor dietary intake, despite the high BMI. These results provide greater understanding on the nutritional status among this population and warrant the importance of optimizing perioperative nutrition care.

Preliminary findings of an online Malaysian young children father mother feeding project: Associations of parental feeding factors and child eating behaviours with body weight status among Malaysian young children aged 6-months to 36-months

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Parental feeding practices may affect child's eating behaviour and body weight status. Limited information is available about its association in Malaysian young children family settings. The objective of this study was to determine the associations of parental feeding factors and child eating behaviours with body weight status (body mass index-for age Z-score

(BAZ) among Malaysian young children aged 6 months to 36 months. An online cross-sectional survey involving both father and mother of healthy full-term children from intact families (n=379) was conducted between March to June 2021. Feeding Coparenting Scale and Feeding Practices and Structure Questionnaire for infants and toddlers were validated and the Children Eating Behaviours Questionnaire were used in this study. Data analysis was performed using IBM SPSS version 26. The present study shows that the prevalence of overweight (BAZ>2SD) was 4.0%, possible risk of overweight (BAZ>1SD) was 10.7%, thinness (BAZ<-2SD) was 6.0% (M=-0.30, SD=1.23). Pearson correlation analyses showed that birth weight (r=0.265, p<0.01), birth length (r=0.186, p<0.01), weight-for-age Z-score (WAZ) change between latest measurement and at birth (r=0.55, p<0.01), paternal weight (r=0.129, p<0.05), maternal weight (r=0.138, p<0.05), and two food avoidant behaviours, namely satiety responsiveness (r=-0.144, p<0.05) and slowness in eating (r=-0.123, p<0.05) were significantly correlated with BAZ. Multiple linear regression results showed that rapid WAZ change between the latest measurement and at birth (B=0.847, 95% CI=0.729, 0.965, p<0.001) and higher birth weight (B=1.850, 95% CI=1.506, 2.194, p<0.001) significantly predicted higher BAZ. In conclusion, birth weight and rapid weight gain between the latest measurement and birth were associated with body weight status among Malaysian young children. Future studies are recommended to include further investigation of the predictors associated with rapid weight gain. A longitudinal study with a larger sample size should be considered to determine the cause-effect relationship.

Free Paper Presentation 1

Reducing anaemia in 36 weeks pregnant mothers

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High prevalence of anemia among pregnant mothers is a worrying problem and this can affect both mother's and baby's health. Anemia trend among 36 weeks pregnant mothers in Muar district has increased from 5.2% (2016) to 7.7% (2018). Muar District Health team has developed a QA project to overcome anemia among pregnant mothers. The standard for the quality intervention is to reduce the percentage of anemia among 36 weeks antenatal mothers to below 7.0%. A cross sectional survey was done in all health clinics in Muar district from January 2018 to December 2020. To evaluate the efficacy of the QA project, the level of anemia knowledge, attitude and practices among anemic pregnant mothers and the level of knowledge among health personnel was conducted using the Investigation Form from MOH QA Anemia Manual. Phase one of QA involved verification of anemia data (January - March 2018) while phase two investigated the contributing factors of anemia among pregnant mothers (September 2018 - December 2019) and phase three involved improvement measures to be done (January 2019 – December 2020). The findings showed data management was <100% (phase 1) while the knowledge level among health personnel was <80% and less nutritional knowledge related to anemia among antenatal mothers (phase 2). Intervention involved anemia record management and anemia line listing, anemia prevention education (flyers and cooking demos) for health personnel and pregnant mothers and anemia management prevention flow chart (Anemia chop, Pharmacology

Intervention Table, QA Anemia Intervention Table). From the intervention, anemia among 36 weeks antenatal mothers was reduced from 7.7% (2018) to 6.5% (2020). Health personnel knowledge increased for the excellent category from 3.7% to 70.7%. Antenatal mothers' knowledge and practice for prevention of anemia also increased. In short, Muar District Health QA project has succeeded to reduce the percentage of anemia among antenatal mothers. Continuous intervention with improvements needed to maintain the achievement.

Maternal consumption of dairy products during pregnancy reduces the risk of eczema in infants during the first year of life

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This study aims to determine the association between maternal consumption of dairy products during pregnancy and the risk of eczema in infants during the first year of life. In this prospective cohort study, 380 mother-child pairs were recruited from selected government health clinics in Selangor and Kuala Lumpur. Data on maternal intake during the third trimester of pregnancy were assessed with a semi-quantitative food frequency questionnaire. Infants' allergic outcomes were assessed at 3, 6, and 12 months of age based on parental reports. The mean dairy products consumption of the mothers was 1.18±0.82 serving/day. About 27.4% of the infants had eczema during the first year of life. After adjustment for confounding variables, results from the multivariable generalised linear mixed model showed that higher maternal intake of dairy products was significantly associated with a decreased risk of infantile eczema (*OR*=0.67, 95% CI=0.47-0.96). This study suggests that higher consumption of dairy products during pregnancy may be protective against childhood eczema. While birth cohorts assessing the role of maternal intake during pregnancy on allergic outcomes in developing countries is scarce, more studies are needed to confirm the findings observed in the present study before dietary recommendations can be made.

Preliminary observations on the dietary intake of Orang Asli Temiar women during the postpartum period

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Following the pattern of other societies in Malaysia, the Orang Asli Temiar women had to follow a set of food restrictions after delivering their babies. During this critical period, the women are only allowed to consume a certain kind of food and usually, restricted foods

are essential in the diet. A study found that these women had to follow the food restriction for one to two weeks. Nevertheless, this restriction was ignored if they deliver their babies in hospitals. The present study aimed to determine the dietary intake of Temiar women during the postpartum period while they were recuperating in JAKOA transit and when they were back home in their village. The study involved a group of 11 Temiar women aged between 20 to 36 years old. Their weight and height were measured during the first visit. The 24-hour dietary recall was collected at two distinct periods: (1) within 5-10 days after delivery and (2) within 20-30 days of the postpartum period. Overall, 54.5% of the mothers have normal weight, 27.3% were overweight and 18.2% of the mothers were obese. Most of their nutrient intake did not meet the nutritional requirements for lactation women. In conclusion, nutritional deficiencies may arise during this postpartum period which will affect not only mothers but also infants.

Minerals and trace elements contents in breast milk of Malaysian mothers

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Breast milk provides the necessary nutrients for the growth and development of infants and young children. Breast milk composition differs from mother to mother due to the differences in dietary intake. This study determined the nutrient composition of breast milk collected from a sample of 20 Malay mothers with infants aged between 2 to 5 months. Breast milk samples were obtained by using a Philips Avent single electric breast pump to express the milk. Each mother provided three samples of breast milk of 25ml at fortnightly intervals. The breast milk samples were collected in sterile tubes and placed on ice and stored in -80°C freezer until analysed using the ICP-MS. This presentation reports on the contents for sodium, chloride, calcium, phosphorus, magnesium, zinc, potassium, selenium, iodine and iron. The results revealed a relatively high concentrations of sodium, zinc and iodine and relatively low potassium, magnesium and iron contents, compared to published results elsewhere. The presentation will discuss the dietary implications of the results of this study.

Parental feeding practices in relation to food neophobia among preschoolers in Terengganu, Malaysia

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Food neophobia is considered a behavioral trait closely linked to adverse eating patterns and reduced dietary quality, which have been associated with increased risk of obesity and non-communicable diseases. There is a link between food neophobia with parental feeding practices as the structuring of dietary intake of the children still highly depends on their parents, however there is a lack of articles and research conducted in Malaysia regarding food neophobia. Therefore, the aim of this study is to determine the association between parental feeding practices and food neophobia among preschoolers in Terengganu, Malaysia.

This study was a cross- sectional study carried out among preschoolers in Terengganu. A total of 135 mothers of 5- to 6-year old children (*M*=5.6 years; 55% girls) completed a questionnaire online about food neophobia and feeding practices. Child food neophobia was measured using the Child Food Neophobia Scale (CFNS) that consists of 10 items where high mean scores of food neophobia indicate a high level of food neophobia. Meanwhile, the Comprehensive Feeding Practices Questionnaire (CFPQ) was used to measure parents' feeding practices that consists three controlling subscales (pressure, restriction for health, and restriction for weight), seven autonomy promoting subscales (environment, encourage balance and variety, teaching about nutrition, monitoring, modeling, involvement and child control) and two using food for non-nutritive purposes subscales (emotion regulation and food as a reward). Higher scores represent using more of those feeding practices. The cross-sectional associations between total CFNS score and CFPQ score were examined via simple linear regression test. The results show that 64.4% of the preschoolers experienced food neophobia. Among autonomy promoting feeding practices, parents that provides a healthy food environment and being a role model to their children's food intake were associated with decreased in children's food neophobia. However, child control practice was associated with increased in children's food neophobia. Our study shows that when the parents allow the child to control his or her eating behavior and parent-child interactions, it will increase the child's food neophobia. Results highlight the need for interventions to educate parents on feeding practices to overcome food neophobia in their children.

Body image and cardiovascular risk factors among Malaysian adolescents

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Adolescents is a crucial moment in life cycle where they go through rapid biology, physiology, and psychological changes that could influence body image perception. Data analysis from cross-sectional data set of MyHeart study was conducted. The MyHeART study recruited students aged 17 years old from 15 government schools (8 urban and 7 rural). Body Image was measured using Stunkard Figure Rating Scale and Body Mass Index (BMI) was classified based on International Obesity Task Force (IOTF) classification. Cardiometabolic risk were assessed using blood biomarkers namely fasting plasma glucose (FPG), triglyceride (TG), low density lipoproteins (LDL), high density lipoproteins (HDL) with blood pressure (BP). Of 1021 respondents, 54.2 % and 45.8% of them have accurately and misperceived their body image. By sex, 19.5% of male respondents (overestimation: 19.2%; underestimation: 0.3%) and 26.3% of female respondents (overestimation: 23.0%; underestimation: 3.3%) misperceived their body image. Overall, about 45.3% among those who were in normal weight and 75.6% among those who were underweight have significantly overestimated their body image, $p<0.0001$. It appears, male adolescents had lower odds of having reduced HDL (*AOR*: 0.62, CI: 0.40-0.92) meanwhile two times higher odds of having elevated blood pressure (*AOR*: 2.00; CI: 1.08-3.72) as compared to female respondents. A future comprehensive study is strongly recommended to investigate the causal relationship of body image and cardiometabolic risk from adolescents to adulthood.

Free Paper Presentation 2

A whole school approach and NuTeen Intervention Program: Impact on secondary school canteen food environment and psychosocial factors of school canteen operators in Kuala Lumpur

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Canteen operators are the key person deciding the quality of food provision to school students and teachers. A healthy school canteen guideline by MOH is a public health strategy to support the development of healthy dietary behaviours in school students. The aim of this study was to evaluate the effect of the NuTeen intervention on secondary school canteen food environment and psychosocial factors of school canteen operators in Kuala Lumpur. A quasi-experimental study design was used and 4 schools were selected randomly. The canteen intervention was developed following the guidelines for Accreditation of Healthy Cafeteria (*Kafeteria Sihat*) by the Ministry of Health. The psychosocial factors examined among the canteen operators were nutrition knowledge, self- efficacy and barriers to change eating habit.Canteen operators in the intervention group significantly improved their nutrition knowledge and consistently decreased over the time among the canteen operators (F=12.34, p<0.001). The intervention showed no effect on self-efficacy among canteen operators. Barriers to change eating habit among the canteen operators in the intervention schools significantly reduced after the intervention (F=3.445, p<0.001). The multivariate analysis showed that overall the intervention decreased the nutritional knowledge by 52% (adjusted β=-0.52, 95%CI=-0.12; -0.88), knowledge on food and nutrients by 60% (adjusted β=0.60, 95%CI=0.11; 0.77) and knowledge on diet and health by 0.79% (adjusted β=0.79, 95%CI=0.01; 0.99). The intervention showed no significant effect for overall self-efficacy to maintain healthy lifestyle. There was a significant reduction by 44% in barriers to change eating habit among canteen operators (adjusted β=-0.44, 95%CI=-0.0; -0.66). Upon the intervention, the score of *Kafeteria Sihat* evaluation criteria increased and the canteen meet the requirement for the accreditation in the intervention schools. In conclusion, the current finding suggests a scale up of a multi-strategic intervention among canteen operator to increase implementation of a school healthy canteen policy based on Management Guide for Healthy School Canteen of Malaysia.

Consumer knowledge, attitude, and practice (KAP) on supplements in relation to COVID-19 pandemic

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Vitamins and minerals are essential micronutrients required in minimal amounts by the human body. To meet the nutrient requirement, some people might need to enhance their

micronutrients intake by taking supplements. However, supplements are not intended to replace a balanced diet. Nowadays, the awareness of living a healthy lifestyle is increasing. Especially during COVID-19 pandemic, people are trying to enhance their immune system by consuming supplements. The objectives of this study were to assess consumer knowledge, attitude, and practice about supplements and to assess the practice of supplement intake before and during COVID-19 pandemic. The study was a cross-sectional study conducted online using google form, distributed to 494 adults (age 20 – 55) living in Jakarta, Bogor, Depok, Tangerang, and Bekasi (JaBoDeTaBek) and Bandung. The data was analysed by descriptive analysis and chi-square using IBM SPSS Statistics 20. The results showed 37.4% consumers had very good knowledge and 50.9% consumers had adequate attitude. Supplement intake increased during COVID-19 pandemic compared to before. Moreover, 45.0% consumers changed their practice of supplement consumption to be better and 48.1% consumers remained their good practice of supplement consumption during COVID-19 pandemic. The practice was not associated with knowledge but associated with attitude of the respondents ($p<0.05$). In conclusion, the knowledge and practice of the consumers towards supplements were already good, but their attitude should be increased.

Frequency of home cooking is not associated with diet quality among Malaysian adults during the pandemic

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During the COVID-19 pandemic, frequency of home cooking has been increasing as more time is spent at home. Previous studies have shown association between frequency of home cooking, body weight status and diet quality. There is limited information on the frequency of home cooking, body weight status and diet quality of Malaysians, especially during the pandemic. This study aimed to determine the association of frequency of home cooking, body weight status and diet quality of Malaysian adults during the pandemic. A cross-sectional study was conducted using online questionnaires, among 100 Malaysian adults aged between 18 to 59 years old. Information on sociodemographic data, anthropometry measurements and meal pattern were collected from the subjects. A two-day 24-hour dietary recall was being carried out via video call. Fisher's Exact test was used to analyse the association between frequency of home cooking and body weight. One-way ANOVA was used to test the association between frequency of home cooking and diet quality. It was found that the frequency of home cooking has increased from 19.0% to 41.0% and the body weight status has no significant difference ($p>0.005$) during the pandemic compared to before. The overall diet quality the subjects was poor (48.8%) during the pandemic. There was no significant association between frequency of home cooking, body weight status and diet quality during the pandemic ($p>0.05$). However, education level ($p=0.022$) was inversely proportional to frequency of home cooking. Age ($p=0.003$), gender ($p<0.001$), ethnicity ($p=0.005$) and marital status ($p<0.001$) were also associated with body weight status. Among all the food groups, frequency of home cooking was associated with only "meat, poultry and eggs" ($p=0.049$). The results suggested that frequency of home cooking might not have an impact on body weight status and diet quality. However, further studies are needed to validate the findings.

The impact of COVID-19 on the consumption of fruits and vegetables in healthy Malaysian adults

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The COVID-19 pandemic has negatively impacted the eating behaviours of the people especially fruits and vegetable intake. Fruits and vegetables are rich in vitamins and minerals, which are well known for strengthening the immune system. As limited research was conducted between the relationship of COVID-19 and fruit and vegetable intake, this study aims to assess the daily intake of fruits and vegetables among Malaysian adults during the COVID-19 outbreak, perceived changes in intake, as well as factors associated with the changes in intake. A cross-sectional study was conducted through online platforms and a total of 506 participants were recruited. Semi food-frequency questionnaires were used to assess participants' fruit and vegetable intake. Socio-demographics information and knowledge, attitude and practices (KAP) of fruits and vegetables and COVID-19 were collected. All statistical analyses were performed using SPSS. Results showed that the majority of participants (99.8%) did not achieve the recommended five servings per day, in which they consumed an average of 0.84 servings of fruits and vegetables per day. 46.4% of participants reported no changes in intake compared to before the outbreak. The analysis showed that fruits and vegetables intake were associated with physical activity level, knowledge, and beliefs of foods that may prevent/cure COVID-19. Binary logistic regression identified two significant risk factors of daily fruit and vegetable intake namely, being a non-Chinese (*AOR*=1.905, 95% CI=1.114 – 3.257) and having good practices scores (*AOR*=2.543, 95% CI=1.611 – 4.015). In conclusion, the study found a low daily intake of fruits and vegetables. The findings suggested that nutritional interventions are necessary to improve awareness on consuming more fruits and vegetables to improve overall health.

Sugar tax in Malaysia: Food industry's response and adolescents' knowledge and attitude towards this tax

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High sugar-sweetened beverage (SSB) consumption is implicated in the development of obesity and related disorders, especially among adolescents. Thirty-seven percent of Malaysian adolescents consume SSB daily. The success of Malaysian Sweetened Beverage Excise Duty (SBED) introduced as a tool to tackle this public health concern on July 1, 2019, is dependent on industry and consumer response to it. Therefore, we aimed to evaluate: (i) food industry's response to SBED and (ii) Malaysian adolescent's knowledge and attitude regarding this tax. We evaluated the actions taken by food industry by

comparing before (June 2018) and after SBED (August 2019) changes in (i) price, (ii) sugar content and (iii) available packaging sizes. The list of taxable SSB products (*n*=251) was obtained from the Ministry of Health (MOH) Malaysia. SBED knowledge and attitude of adolescents was assessed in a cross-sectional survey of 156 adolescents (aged 16 to 19 years) enrolled in pre-university programmes at the International Medical University (IMU), Kuala Lumpur. Overall, significant decreases in mean (*SD*) SSB sugar content 1.85±3.05 g/100ml and increases in price RM0.07±0.11/100ml were observed one-year post introduction of SBED. Only 14 SSBs (8%) had smaller packaging size available post-SBED. Among the respondents surveyed, only 28% were aware of SBED and the level of knowledge of SSB-disease link was moderate (average score= 67%). Fifty six percent of the respondents viewed the tax positively. To summarise, food industries have responded to the SBED in Malaysia by increasing the price of SSBs and have reformulated the SSBs to be healthier by decreasing the sugar content with minimal reductions in SSB packaging size. Adolescents in this study supported SBED as a public health initiative, but awareness that SBED was implemented in Malaysia was low. Campaigns to improve awareness on SSBs health effects and SBED implementation will be useful among Malaysian adolescents who are major SSB consumers.

The effect of germinated brown rice on blood glucose, glycated haemoglobin levels and BMI in patients with type 2 diabetes

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Diabetes is a global public health issue with significant morbidity and is recognized as an important cause of mortality. Especially in Asia where it is endemic, the consumption of white rice (WR) is thought to play an important factor. Based on preliminary findings on the positive effects of brown rice on diabetes, we hypothesized that the consumption of high fibre and nutrient dense germinated brown rice (GBR) might have positive effects on glucose parameters. Using quasi experimental design, 16 patients who were diabetic and on standard treatment were recruited to 6 weeks on WR diet or GBR diet separated by a 2 weeks washout period in a crossover design. In the GBR diet, subjects were instructed to substitute daily consumption of WR with GBR. Body mass index (BMI) and blood samples were collected 4 times (in study weeks 0, 6, 8 and 14) for fasting blood glucose and glycated haemoglobin (HbA1c) determination. No significant difference in BMI and levels of FBG and HbA1c were noted before consumption of the WR diet or the GBR diet. Neither WR diet nor GBR diet showed statistically significant difference of changes in BMI, FBS and HbA1c levels for 6 weeks. However, there was a small arithmetic reduction (0.68%) of mean HbA1C levels after consuming the GBR diet for 6 weeks and the difference was close to significance (p=0.078). These preliminary findings indicate that GBR may have positive effect on blood glucose control and with further larger scale work may be used as functional food in the control of diabetes.

Invited Lecture 2

Bile acid is a responsible host factor for high-fat diet-induced gut microbiota alterations in rats: Proof of "bile acid hypothesis"

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It has been reported that gut microbiota is involved in the metabolic disease development especially on a high-fat diet (HFD). Much work has been done on the elucidation of the causal relationship between HFD-induced gut microbiota alterations and host pathophysiology. However, mechanisms underlying HFD-induced gut microbiota alterations remain unclear. Previously, we showed that bile acid (BA) is a host factor that regulates the composition of gut microbiota in rat cecum as BA generally exhibits bactericidal activity. Based on this finding, we hypothesized that BA is responsible for HFD-induced gut microbiota alterations as BA excretion increases in response to HFD intake (bile acid hypothesis). Here, we show the proof of this hypothesis using a rat model fed either HFD (230 g lard per kg diet) or cholic acid (CA) (0.5 g CA per kg diet). In HFD-fed group, concentration of total BA including highly bactericidal deoxycholic acid (DCA) in cecum significantly increased after 8 weeks, accompanying dysbiosis of cecal microbiota with increased Firmicutes/Bacteroidetes ratio. OTU (operational taxonomic unit) analysis revealed that abundance of 69 OTUs (amounting to 62% of the cecal microbiota of the control diet-fed rat) showed positive or negative correlation with total BA concentration in cecum. The bacterial isolates from HFD-fed group showed significantly higher resistance to DCA in Firmicutes than in Bacteroidetes. Then, top 12 abundant OTUs that showed positive or negative correlation were selected each from Firmicutes and Bacteroidetes (total 24 OTUs) and were matched with their corresponding OTUs in rats fed CA for 8 weeks. Comparison of the alterations of the relative abundance of each OTU between the two diet groups revealed that 19 out of 24 OTUs (amounting to ~51% of the cecal microbiota of the control diet-fed rats) altered in the same direction (increase or decrease) in both diet groups. It was concluded that these results clearly proved the "bile acid hypothesis".

Invited Lecture 3

Precision nutrition and cardiovascular diseases

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About 70 years ago, Ancel Keys proposed the "diet and heart hypothesis." The concept was simple: a diet rich in saturated fat and cholesterol was associated with elevated blood cholesterol; elevated blood cholesterol was associated with coronary heart disease; therefore, a diet high in saturated fat and cholesterol was associated with CHD. The hypothesis' simplicity and logic propagated the concept, both in the research environment and in the popular press. However, not everybody embraced this hypothesis, which has been continuously contested.

Why something so simple, as the relation between diet and cardiovascular diseases (CVD), got so complicated?

Because we are complicated, as shown by the enormous interindividual variability and low intraindividual reproducibility observed in every intervention study, irrespective of this being with diet or drugs or behavior. Moreover, food is complicated. For example, foods with the same composition provide different energy per serving depending on the matrix. Moreover, there is increasing interest in the food "dark-matter." All those thousands of potentially functional compounds, still unknown to us, could be potentially the key that will help us to understand how what we eat affects our health.

In the '80s, the ability to detect genetic variants gave birth to another simple hypothesis: variability in genes is responsible for the variability in diet response. The testing of this hypothesis applied to CVD has resulted in over 1000 publications. However, the immense majority have investigated gene-diet interaction related to CVD risk factors, and less than 30 published studies have targeted CVD events. The findings are promising, but for the most part, have not been replicated, and they have been reported in observational studies. The Predimed study, in which 7447 participants, free of CVD at baseline, were randomized to either a low-fat diet or a Mediterranean diet, is among the few intervention studies describing gene-diet interactions for CVD events, as shown by research involving the LPL and TCF7L2 genes. An important message from the Predimed findings is that the Cardiovascular benefits from the right gene-diet combination materialize even in older adults with high CVD risk. Suggesting that it is never too late for CVD prevention if one uses the right approach.

So far, most researchers have been investigating what people eat. Still, it is also important to examine the impact of when we eat, and this may be highly relevant for CVD that has been shown to have circadian and seasonal rhythmicity. In this regard, we have demonstrated that genetic variants at the circadian *CLOCK* gene modulate the relation between diet and CVD events.

However, after decades of focusing on gene-diet interactions, precision nutrition has grown to incorporate additional techniques and modulators, such as epigenetics, metabolomics, microbiome, aging, biological sex, lifestyle, chronobiology, co-existing diseases, drugs, taste, smell and the environment. Given the resulting huge increases in data collected, we must adopt new approaches to query and analyze these Big Data sets, such as Artificial Intelligence. This combination of data and analytical tools will pave the way to precision nutrition and successful nutrition-based CVD prevention and therapy.

Symposium 3: School Child and Adolescent Nutrition

Whole grain consumption among children and adolescents

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Several lines of evidence have constantly showed that inclusion of whole grains in the diet may prevent several chronic diseases. Although much of the research has been conducted

in adult population, it is thought that children and adolescent populations may also benefit from whole grains intake. In spite of these recognized health benefits, whole grains intake still fall below the recommended levels in almost all countries worldwide, including children and adolescents from Malaysia, Italy, France, United states of America, United Kingdom, Australia and Ireland, based on the data reported by nationally representative dietary surveys. Public health bodies in several countries are attempting to increase population-wide habitual consumption of whole grains. The efforts focus on (1) a global definition of whole grain, (2) whole grain application-food policy, (3) sustainability of whole grain, (4) best practices for public-private partnerships and communication; as well as (5) economic evaluation of increased whole grain intake. The whole grain initiative aims to increase consumption of whole grains cannot be limited to one or two stakeholders, but must be addressed using the combine efforts of all parties involved in the food supply chain. Ever since recommendations to increase whole grain consumption are part of dietary guidelines around the world, numerous new products based on varying contents of whole grains have become available. The diversity of whole grains as a group of raw materials, as well as the range of different food processes used and the variety of products available in the marketplace, makes it difficult to estimate intakes of whole grains with high precision in research studies. Thus, we have developed, validated and tested the reliability of a whole grain food frequency questionnaire specifically to assess whole grain intake in Malaysian children. Besides, when countries set specific recommendations for whole grains intake, the authorities should take great care not to promote whole grain processed foods with a high sugar and salt content. Recently, researchers have expressed concern that the overzealous use of processed whole grains products in children and adolescent population, could compromise their nutritional status. Research showed that children with the highest intake of whole grain also have the highest intake of sugar. This could attenuate any subsequent health benefits and reduce intake of certain essential nutrients. Findings of one of our study showed that children who consumed higher whole grain tend to reduce the fat intake; however, it would also reduce the essential fatty acid intakes. Future collaboration may be conducted between industry, government and universities to promote essential fatty acids-rich foods and whole-grain food, although not to promote processed whole-grain foods with a high sugar and salt content in children and adolescent population.

Dietary patterns and cardiometabolic risks among Malaysian adolescents

Geeta A

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While growing evidence suggesting that dietary patterns of adolescents tend to be of poor quality, this was not sufficiently assessed in relation to the manifestation of cardiometabolic risks in Malaysia. This along with queries and concerns of most number of parents, researchers and policy makers on the aspects of diets of children including adolescents for optimal development as well as to prevent early manifestation of cardiometabolic risks, and what aspects of Western diets are unfavourable to overall health are often raised. Identification of dietary patterns that are explicitly linked to cardiometabolic health in adolescence may have important implications for timing interventions, key aspect of dietary factors and public health policies aimed at preventing future cardiovascular diseases.

We cross-sectionally examined dietary patterns using two distinct techniques; reduced-rank regression (RRR) and a pre-determined dietary index namely the Malaysian Healthy Eating Index (HEI) in a total of 336 adolescents aged 13 years. These adolescents were recruited from randomly selected public secondary schools in three southern states of Peninsular Malaysia including Negeri Sembilan, Melaka and Johor. Besides dietary assessments, various other information including anthropometric, biochemical and parental factors

were collected. Prior to the analyses of dietary patterns, dietary information obtained using the MyUM food frequency questionnaire was merged into 14 food groups based on their nutrient profiles and culinary usage. Since RRR identifies a linear combinations of weighted food intake, that is, food groups by explaining much of the variation in a set of response variables that are hypothesised to be linked to the outcome of interest, we have included four dietary factors for higher cardiometabolic risks – dietary energy density (DED), fibre density, percentage of energy from total fat and added sugar. The RRR analysis derived a dietary pattern characterised by food groups high in added sugar, fibre and DED, and low in fat. Food groups that were notable to the identified dietary pattern included sugar-sweetened beverages, fruits, sweets.

On the other hand, scores of Malaysian HEI was calculated based on the adherence of consuming seven food groups (in serving sizes), percentage of energy from total fat and sodium intakes (in mg) as described in Malaysian Dietary Guidelines for Children and Adolescents, 2013. Each adolescents in this study received scores for both the dietary patterns; a weighted z-score for RRR dietary pattern and total Malaysian HEI score (in %; 100% being the highest). An increasing score for both of these dietary patterns indicated greater adherence to the identified dietary patterns, respectively. For instance, increasing score for RRR dietary pattern indicated greater adherence to 'high sugar, high fibre, high DED and low fat' dietary pattern whereas an increasing score for Malaysian HEI indicated an overall 'healthy' dietary pattern. The associations between adherence to the identified dietary patterns and various cardiometabolic risk factors including overweight/obesity, abdominal obesity, dyslipidaemia, elevated levels of fasting blood glucose, low-density lipoprotein (LDL), triglycerides, serum insulin and insulin resistance, and low levels of high-density lipoprotein (HDL) were assessed using logistic regression models.

The mean(SD) age of the study adolescents was 13.5(0.3) years and predominant by females (68%), those from rural areas (54%) and Malay ethnic group (87%). The prevalence of being overweight or obese and having dyslipidaemia was 32% and 24%, respectively. The overall diet quality of the adolescents was rather poor (49%), with a greater percentage of males were found to have low dietary quality score compared to females (56% vs. 39%; $p<0.05$). After adjusting for sex, school location, maternal education, physical activity, dietary misreporting and BMI z-score, adolescents with greater adherence to the 'high sugar, high fibre, high DED and low fat' dietary pattern were significantly associated with higher odds of having dyslipidaemia (*OR*=2.7; 95%CI: 1.3, 5.6) and elevated LDL levels (*OR*=1.9; 95%CI: 1.0, 3.5) compared to those with the least adherence. No significant associations were observed between the adherence to the Malaysian HEI and any of cardiometabolic risks.

The 'high sugar, high fibre, high DED and low fat' dietary pattern identified using RRR was significantly associated dyslipidaemia and elevated LDL levels among adolescents in this study. The lack of significant associations found for the Malaysian HEI could be due to the fact that it did not comprise the intakes of added sugar as in sugar-sweetened beverages, chocolates and sweets, which appeared to be the key features of the RRR dietary pattern. Further prospective studies are needed to strengthen the role of a dietary pattern explained by food intakes high in sugar and energy density in the development of cardiometabolic risks in young people in order to design effective health interventions.

Implementation of Malaysia School Nutrition Promotion Programme (MySNPP) during the COVID-19 pandemic – experiences and learnings

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Malaysia School Nutrition Promotion Programme (MySNPP) has been developed to provide nutrition knowledge and supportive environment to encourage children to practise healthy eating. The objective of this presentation is to share the experiences and learning points from the MySNPP for primary school children in Batu Pahat District, Johor during the school closures arising from the COVID-19 pandemic.

The MySNPP consisted of two main components: (1) to deliver nutrition education to the children by trained teachers using the Good Nutrition Key to Healthy Children (GNKHC) module and (2) to provide healthy meal to the children by trained canteen operator during school recess at the school canteen. The original plan was to conduct training of trainers to the school teachers and canteen operators. However due to COVID-19 pandemic and school closures, these trainings were postponed. It was recognised that providing nutrition education to school children during the lock-down is important as this will help to improve their immunity during pandemic. In order not to add burden to teachers for their online classes, nutrition education component was delivered by trained nutritionist using the GNKHC with modifications on the interactive activities that suit to online platform during school holiday. Teachers are also invited to participate in this programme.

A total of six schools were being approached, and two schools consented to participate in the nutrition education component via online platform at home during school holiday in June 2021. A total of six teachers and 112 Standard Three children participated in a four-day online nutrition education programme during school holidays. Informed consent of teachers and parents of the children were collected through Google Forms. Before school holiday started, all the teachers and children received the GNKHC education kits and education materials. Leaflets for parents were passed together to all children whereby an online nutrition education talk was delivered by nutritionist to all parents after their children completed the online nutrition education sessions. The children's body weight and height were measured by trained nutritionist at schools prior to school holiday. The programme feedback from teachers, parents and children were collected through Google Form after the programme.

Out of 112 children who agreed to attend the four-day online programme during school holiday, 93.1% of the children had full attendance by completing four-day programme, while 6.9% of the children completed three days of the programme. All the teachers rated the programme as satisfactory (100.0%); they strongly agreed (100.0%) that the module was easily understood and interesting. Most of the children (92.1%) liked all the topics in the GNKHC module; 97.2% of the children understood the content of the GNKHC module and 93.5% of the children liked the online GNKHC sessions. A total of 89 parents (79.5%) attended the nutrition education talk and gave positive feedback on MySNPP.

Although there were challenges in conducting the MySNPP in school during COVID-19 pandemic, the involvement and support of school authorities, parents and children played major roles in the success of the online nutrition education component of MySNPP. Various experiences and learning points were gained, particularly from the different type of interactive games for primary school children and education talk to parents. The education module is relevant and important for school children and their teachers and parents and can be implemented virtually during COVID-19 pandemic. Nutrition education implementation needs to be creative and adapt to the current situation. We highly recommended this module to be rolled-out to all Malaysia primary school.

Invited Lecture 4

Blood glucose management as a strategy in influencing metabolic health and immunity

Goh PE

BENEO-Institute/BENEO Asia Pacific Pte Ltd

Consuming a healthy diet is a powerful tool in managing blood glucose levels and supporting better immune health. High blood glucose in diabetes not only damages the body's organs, it also weakens the immune system, making it harder to fight off infections. Recent evidence shows that the combination of elevated blood glucose and COVID-19 leads to more severe infection outcomes and greater rates of mortality. Compounding this problem, most of the foods we eat in Asia tend to be medium to high glycaemic, leading to higher than desired blood glucose profiles.
The food industry can play an important role by providing more low glycaemic options to replace high glycaemic carbohydrates in foods and beverages. Importantly, choosing the right ingredients based on the strength of the scientific evidence matters when it comes to supporting healthy eating.

BENEO's contribution towards better metabolic and immune health is by offering innovative, evidence-based prebiotic chicory root fibres and carbohydrates with particular health benefits, namely Palatinose™ (isomaltulose) and isomalt, to food manufacturers for improving their recipes and also enabling them to target specific consumer groups.

Chicory root fibres are one of the few scientifically-proven prebiotics. They are special nutrients for the gut microbiota that positively influence their composition and activity, thereby conferring numerous health benefits. These benefits include improved overall digestive health, blood glucose management, metabolic health, and also strengthening of the body's inner defence to support immune health.

Other ingredients that contribute to healthier blood glucose levels and hence immune health are Palatinose™ and isomalt. Palatinose™ is a slow-release, low glycaemic carbohydrate that provides a lower and more balanced blood glucose and insulin profile. At the same time, it supplies the carbohydrate energy needed to go through the day. Isomalt, a polyol, is an ingredient used in sugar reduction and sugar-free applications. It has a negligible impact on blood glucose and insulin levels.

By supporting a stronger immune system and better metabolic health, taking care of our blood glucose levels through the diet is key in staying healthy now and in the future.

Symposium 4: Physical Activity and Sedentary Behaviour

Physical activity and health-related fitness in Asian adolescents: The Asia-Fit Study

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The present study aimed to investigate and compare physical activity (PA) and health-related fitness in Asian adolescents, as well as examine the associations between meeting PA guidelines and attaining fitness standards. A sample of 12,590 adolescents (M_{age}=13.63 years, *SD*=1.01) from eight Asian metropolitan cities, including Bangkok, Hong Kong, Kula Lumpur, Seoul, Shanghai, Singapore, Taipei, and Tokyo, completed measurements of PA, five field-based health-related fitness tests, and covariates. The fitness test scores were further classified into Healthy Fitness Zone (HFZ) or Needs Improvement Zone (NIZ). Results showed that adolescents' levels of PA and fitness components differed by cities. Shanghai adolescents were the most physically active and highest in handgrip strength, whereas Tokyo adolescents were highest in aerobic fitness and muscular endurance. City differences were also found in proportions of meeting PA guidelines and achieving the HFZs of aerobic capacity, muscular fitness, and body composition. After controlling covariates, meeting PA guidelines positively associated with being in the HFZs of aerobic and muscular fitness, but the association was not significant with being in the body composition HFZ. In conclusion, there was a large variation in PA and health-related fitness in adolescents across the eight Asian cities. Asian adolescents achieving PA guidelines were more likely to be in the HFZ of aerobic and muscular fitness. Future longitudinal research is recommended to investigate changes in objectively-measured PA and fitness and gain better insights into their relationships.

Physical activity in women

Khoo SPL

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The link between regular physical activity and physical and psychological health has been well documented. Individuals of all ages can gain an array of physical, psychological, social, and emotional benefits from physical activity. Even moderate amounts of physical activity can lead to improvement in bone, functional and cognitive heath and cardiorespiratory fitness as well as prevention of chronic diseases such as coronary heart disease, high blood pressure, metabolic syndrome, diabetes, depression, some types of cancer (breast and colon), and osteomuscular diseases. Health benefits appear to be proportional to amount of activity, therefore any increase will be beneficial. The World Health Organization recommends that adults participate in at least 150 minutes of moderate-intensity aerobic activity each week, or at least 75 minutes of vigorous-intensity aerobic activity, or an equivalent combination of both to gain health benefits. A failure to meet these recommendations and a sedentary lifestyle could result in a decrease in life expectancy and increased burden of disease. Despite the well-established benefits of physical activity,

the World Health Organization estimates that more than a quarter of the world's adult population do not do enough physical activity. And compared to men, a higher percentage of women are insufficiently active. Women face various social and environmental barriers to participation in physical activity. This presentation will highlight the benefits of physical activity for women, participation rates, as well as barriers and facilitators faced by women.

Association between recreational physical activity and colorectal cancer with presence of metabolic syndrome and its components: A multicentric hospital-based case control study in Peninsular Malaysia

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Physical activity has favourable effect on many metabolic and cardiovascular risk factors that constitute or are related to the metabolic syndrome (MetS) as well as the development of certain cancers. This study aims to determine the association between different types of physical activities and risk of colorectal cancer (CRC) among patients with MetS. This is a multicentric hospital-based case control study that included 140 histologically confirmed and newly diagnosed CRC cases and 280 healthy and cancer free controls. MetS was assessed based on International Diabetes Federation criteria. All data was analysed using SPSS version 23. Engagement with recreational physical activities reduces the odds of CRC risk by 57.8% (*OR*=0.426, 95% CI=0.27, 0.664). The recreational physical activity reduces the odds of CRC risk by 67.7% among patients with MetS (*OR*=0.323, 95% CI=0.143, 0.727). Across all components of MetS, recreational physical activity reduces the odds of CRC risk by 55.5% among patients with abdominal obesity (*OR*=0.445, 95% CI=0.234, 0.848), by 60.4% with hypertension (*OR*=0.396, 95% CI=0.219, 0.718), by 53.5% with low HDL-cholesterol (*OR*=0.465, 95% CI=0.251, 0.863), by 57.5% with high triglycerides (*OR*=0.426, 95% CI=0.200, 0.903) and by 66.8% with hyperglycaemia (*OR*=0.332, 95% CI=0.166, 0.666). Work-related or travel-related physical activities as well as total physical activity intensity had no association with CRC or the presence of Mets. It is important to increase recreational physical activity recommendations and raise awareness in the population about the health benefits of PA to reduce CRC risk by controlling the incidence of MetS.

Poster Presentations

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

A01 Association between maternal factors with children's health-related quality of life (HQOL) among households living in People's Housing Program (PHP) Klang Valley, Malaysia

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Health-related quality of life children covered various aspects of children's personal development including the physical, psychosocial and the overall quality of life that can described the general health of the children. The objective of this study was to identify the association between maternal factors; mother's age, level of education, employment status, level of nutrition knowledge, general health status through self-reported of chronic diseases and depression status with children's HQOL. A cross-sectional study was conducted involving 315 pairs of mother and children aged seven to 12 years old living in PHP Klang Valley, Malaysia. HQOL of the children was measured using the Paediatrics Quality of Life (PEDs-QL), depression status was measured using Patient Health Questionnaire-9 (PHQ-9) and the remaining factors using set of demographic questionnaire and all the data obtained through face-to-face interview with the mothers. Bivariate and multivariate analysis were conducted to assess the association of the factors with HQOL of the children. Majority of the children (85.4%) was categorised in very good status of HQOL and the remaining 14.3% was categorised in good and fair HQOL level. Chi-square analysis was conducted and out of these factors, only level of education was significantly associated with HQOL of the children (χ^2=4.497, p<0.05). Next, binary logistic regression was further explored and three maternal factors; level of education, employment status and age (p<0.25) were included in this analysis. From the logistic, level of education significantly remained to act as a potential factor to child HQOL (*OR* 1.89; 95 CI 1.89 – 14.9). Increasing in level of mother's education was associated with increased in HQOL of children. Mother plays an important role as they are the primary caregiver that hold the responsibility towards children's overall health status. Thus, improvement in mother's education might helped mother to have a better understanding in addressing any potential risk that might influenced children's quality of life.

A02 Nutritional status and quality of life among Malaysian elderly who practise Qigong

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Qigong is an ancient Chinese exercise that combines the principles of meditation, breathing techniques and slow body movements. It provides many health benefits to its practitioners

such as improving body balance, quality of life and blood pressure control. This cross-sectional study aims to assess nutritional status and quality of life among elderly who practise Qigong in Ipoh, Perak. Elderly aged 60 years who practised Qigong at least 3 times a week for a minimum of two years were recruited from parks, courts and fields in Ipoh, Perak. Nutritional status and quality of life were assessed using a Self-Mini Nutritional Assessment (Self-MNA) and 20-Item Short Form Health Survey (SF-20) via paper questionnaires and online questionnaires. A total of 151 subjects (104 females, 47 males) with an average age of 69.9±6.5 years participated in this study. Based on their measured and self-reported body weight and height, their mean body mass index was normal (23.3±3.3 kg/m^2). On average, subjects in this study practised Qigong for 412±214 minutes per week. The subjects reported normal nutritional status with a mean Self-MNA score of 12.1±1.6. The reported quality of life was good, with SF-20 scores ranging from 73.9±15.9% to 99.2±5.1%. Significant gender differences were found in the mental health score and bodily pain score ($p \leq 0.05$). In conclusion, the elderly who were regular Qigong practitioners in this study had normal nutritional status and good quality of life.

A03 Association of dietary glycemic index and dietary glycemic load with body fat among aboriginal children in Negeri Sembilan

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Foods with high glycemic index and high glycemic load absorbed faster by our body and resulted in high glycemic response, which promoted fat oxidation and higher fat storage. The objective of this study was to determine the association between dietary glycemic index and dietary glycemic load in relation to body composition measures of aboriginal children in Negeri Sembilan. This was a cross-sectional study conducted in three Aboriginal primary schools in Negeri Sembilan which involved 286 Aboriginal children. Semi-quantitative food frequency questionnaire was used to assessed their food consumption. DietPLUS software was used to obtain GI and GL of foods and all the data was analysed using IBM SPSS Statistics software. The prevalence of obesity was 21.5%. The prevalence of obesity was higher among the children aged 10-12 years old compared to 7-9 years old (86.1% and 13.9%; χ^2=0.072, p=0.003). The proportion of high GI (Q4) was high among employed aborigines' parents (60% and 40%; χ^2=9.970, p=0.019). There were significant positive but weak correlation between body fat percentage and total glycemic index (r=0.181, p=0.032) and total glycemic load (r=0.167, p=0.047) of fruit group. Based on the data analysis, dietary advocations should concentrate on enhancing intakes of fruits with low GI and GL in order to prevent the accumulation of body fat.

A04 Dietary Inflammatory Index and obesity among aboriginal primary school children in Negeri Sembilan

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The Dietary Inflammatory Index (DII) is used as a dietary tool to quantitatively assess the inflammatory potential of an individual's diet. The rate of obesity among Malaysian children is increasing across the decades. Numerous epidemiological studies had been conducted and consistently showed a positive association between DII and obesity among the adults but few studies had been conducted among the children. This research aims to examine the association between the DII and prevalence of obesity among the aborigine children in Negeri Sembilan. It is a cross-sectional study that included 160 primary school aborigine children. DII scores were calculated from dietary data collected using a semi-quantitative food frequency questionnaire (SFFQ). The WHO BMI-for-age (BAZ) (5-19 years old) reference was used to categorize the weight status of the subjects into normal (-2SD to 1SD), overweight (>+1SD), and obese (>+2SD). The statistical software IBM SPSS v.20 was used to analyze the data. Based on the results, 52.5% were male children and, 66.3% of the children age between 7 to 9 years old. The overall DII score range from -3.72 (most anti-inflammatory) to 3.67 (most pro-inflammatory), with a mean score of -1.15. A total of 40% of them were categorized as overweight and obese, 54.4% categorized as normal weight and 5.6% as thinness. The total DII score was associated with age group (p=0.04), household size (p<0.05), and household income (p=0.02). The BAZ is only associated with household income (p=0.02). Results obtained from binary logistic regression showed that DII (both as categorical and continuous) was not associated with obesity (all p>0.05). The result remained insignificant even after adjustment for age category, household size and parental employment status. When DII were analyzed as categorical, the adjusted odds ratios (a*OR*) for T2 is 1.90 (0.67-5.37) and T3 is 1.38 (0.44-0.48), whereas when DII was analyzed as a continuous variable, the a*OR* was 1.11 (0.84-1.48). In conclusion, there is no significant association between DII and obesity among the aborigine children in this study, however, taking into account the influence of diet on inflammation and health outcomes, intervention programs are needed to improve the diet quality (towards anti-inflammatory) to improve the nutritional status of the aborigine children.

A05 Factors associated with sedentary behaviour among university students

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A past study has claimed that a high prevalence of sedentary time was found among young people especially university students and this issue becomes more concerning when further studies have proved that engaging too much time in sedentary behaviour can adversely affect health. The objective of this study is to determine the factors associated with sedentary behaviour among students in the Faculty of Engineering, Universiti Putra Malaysia. The questionnaires were distributed online by using google form. A socio-demographic questionnaire, Past-Day Adults' Sedentary time (PAST-U) questionnaire, Global Physical Activity Level (GPAQ), Pittsburgh Sleep Quality Index (PSQI) and Depression, Anxiety, and Stress Scale (DASS-21) questionnaire were used in the study. A total of 122 respondents were included in this study by using simple random sampling. The finding highlighted that 54.1% of the respondents were women and 45.9% were men with mean age of 22.02±1.10

years. Majority of the respondents were Malay (80.5%), and fourth-year students (42.6%) of the Aerospace Engineering program (33.6%). Most of their mother and father have tertiary education levels with 57.4% and 65.6% respectively. Around 41.0% of them were from B40 families with an average family income of RM10221.18±1.75 monthly. Majority of respondents (96.7%) were reported living in an urban area with 3.65±1.75 siblings. A total of 34.4% respondents were having a moderate level of depression, while 43.3% were found dealing with extremely severe anxiety. The body mass index (BMI) indicates more than half of the respondents (69.7%) had a normal body weight and only a few respondents (19.7%) were reported to have a good quality of sleep. Meanwhile, 36.1% of the respondents were practicing a moderate physical activity level. A high prevalence of sedentary time was shown in this study whereas 89.3% of the respondents were reported to engage with sedentary activity for more than 7 hours per day. Overall, the finding indicates that time spend on sedentary activity was 12.45±4.721 hours a day. Age (r=0.347; p<0.008), family income (r=0.293; p<0.028), depression (p<0.003), and physical activity level (p<0.039) were associated significantly with sedentary behaviour. In conclusion, the prevalence of sedentary behaviours among engineering students in this study was high and factors such as age, family income, depression, and physical activity were related to sedentary behaviour. Thus, this situation urged for appropriate intervention programs as well as the nutritional approach in order to reduce the risk of certain avoidable diseases and at the same time improving the quality of life among youth.

A06 Associations between socio-demographic, body mass index, body image perception, physical activity and sleep quality with mental health among university students in Universiti Putra Malaysia

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COVID-19 pandemic affected one's mental health and this include university students. Mental health problems among university students became one of the global main issues. There is limited study on factor associated with mental health among university student during this COVID-19 pandemic. Therefore, this study aimed to determine the associations between socio-demographic, body mass index, body image perception, physical activity and sleep quality with mental health among university students in Universiti Putra Malaysia. This is a cross-sectional study with a total sample of 130 students aged 18 to 25 years old. The respondents were recruited through a multistage sampling. An online self-administered questionnaire was used to collect the data on socio-demographic characteristics, weight and height, body image perception (Body Shape Questionnaire-8C, BSQ-8C), physical activity (Global Physical Activity Questionnaire, GPAQ), sleep quality (Pittsburgh Sleep Quality Index, PSQI), and mental health which was accessed using 21-items Depression Anxiety Stress Scale (DASS-21). Majority of the respondents were female (76.2%), Malay (78.5%), in second year of study (28.5%), from low income family (59.2%) and stayed with parents during COVID-19 pandemic (57.7%). Results showed 44.6% of respondents had depressive symptoms, 56.9% had anxiety symptoms and 29.2% had stress symptoms with severity mild to extremely severe. Body mass index (r=0.205, p<0.05), body image perception (r=0.538, p<0.01), and sleep quality (r=0.460, p<0.01) were significantly associated with depression subscale. Meanwhile, body image perception (r=0.449, p<0.01), and sleep quality (r=0.450, p<0.01) were significantly correlated with anxiety subscale. Stress subscale was significantly correlated with body image perception (r=0.473, p<0.01) and sleep quality (r=0.492, p<0.01). Socio-demographic characteristics and physical activity were not correlated with depression, anxiety and stress. Affected students should

be helped and referred to professional health practitioner to ensure they able to overcome with these problems and remains healthy during this pandemic.

A07 Factors associated with disordered eating among undergraduate students of Universiti Putra Malaysia during movement control order

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Movement Control Order (MCO) during COVID-19 pandemic has resulted in significant dietary and lifestyle changes to our daily living. However, the impact of MCO on dietary behaviors and lifestyles among Malaysian university students remain unknown. This study aimed to determine the prevalence of disordered eating and its associated factors among university students in UPM during MCO. This was a retrospective, cross-sectional study conducted among 290 undergraduate students in UPM recruited via virtual snowball sampling method. Disordered eating behaviors, sleep quality and psychological distress were assessed using validated scales: Eating Attitude Test (EAT-26), Pittsburgh Sleep Quality Index (PSQI) and 21-item Depression Anxiety Stress Scale (DASS-21), respectively. Meanwhile, self-developed questionnaires adopted from the literature were used to gauge social media usage and fear of COVID-19. Factors associated with disordered eating were determined using chi-square test and independent t-test. The prevalence of disordered eating among UPM undergraduate students during MCO was about 25.5%, with a greater proportion observed in students who were Malay (p=0.024), non-science courses (p =0.003), heavy usage of Twitter (p=0.049), and those who had a greater level of depression (p=0.006), anxiety (p=0.006), stress (p=0.039) and sleep disturbance (p=0.035). However, no significant associations (all p>0.05) were found between disordered eating behavior with age, gender, place of living during MCO, monthly pocket money, usage of different social media platforms (i.e., Facebook, Instagram, Youtube & Tiktok), other components of sleep quality (i.e., subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, use of sleeping medication, daytime dysfunction) and fear of COVID-19. Disordered eating during MCO is prevalence among undergraduate students in UPM. Prevention and intervention strategies including the emphasis of mindful eating and stress management are essential to address this issue.

A08 Nutritional related factors and its association with delayed sputum smear conversion among Pulmonary Tuberculosis Patients in Kota Kinabalu, Malaysia

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Tuberculosis (TB) control system aims to control disease spread, and the most effective way to prevent transmission is to cure patients with smear-positive pulmonary TB (PTB), which is highly contagious. Conversion of sputum smear indicates the patient's response to therapy and the TB treatment program's efficiency. This study aims to determine nutritional-related factors contributing to the delayed conversion of sputum smears at the end of the intensive TB therapy phase. This cross-sectional study was carried out on patients with smear positive PTB patients treated in the five TB treatment canters in Kota Kinabalu, Sabah, Malaysia, from June 2019 to February 2020. Logistic regression models were used to assess the association of sociodemographic characteristics, clinical variables, nutritional status, and dietary intake with the delayed conversion of sputum smear. Thirty-five (13.9%) patients were identified as having delayed sputum conversion. Multiple logistic regression analysis found that PR1 Manggatal (a*OR*: 10.20, 95% CI:3.30-31.46), no directly observed therapy, short-course (DOTS) supervisor (a*OR*: 17.21, 95% CI:3.02-98.05), advanced Chest X-ray finding (a*OR*: 7.46, 95% CI: 1.31-42.59), high total white cell (TWC) (aOR: 6.05, 95% CI:1.99-18.42), high urea (a*OR*: 7.74, 95% CI: 2.06-29.12), anaemia (a*OR*: 6.26, 95% CI:1.67-23.478), low vitamin A intake (a*OR*: 1.01, 95% CI:1.00-1.01) and low vitamin C intake (a*OR*: 1.03, 95% CI:1.00-1.06) were having significant results. The sputum conversion rate among TB patients in this study was satisfying. To improve the sputum smear conversion rate, we need to increase the percentage of DOTS supervisors and early detection of PTB to prevent advanced PTB during diagnosis. Future studies should evaluate the mechanisms in which high urea is associated with delayed sputum conversion. Nonetheless, TB patients of rural residence warrant special attention. Nutritional referral and support for those who are needed may be beneficial.

A09 Knowledge, attitude and practices on malnutrition among caregivers of the post discharge older adults in Klang Valley

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Population aging is a global social phenomenon. Older adults with many-sided care are vulnerable to nutritional risk often need transition care. Transition care involves handover of patient information, communication between health care professionals and the caregiver as well as transfer responsibility. The development of transition malnutrition care programs is still not clearly established in Malaysia. Therefore, this cross-sectional study aimed to determine the knowledge, attitude and practices on malnutrition among caregivers of the post-discharge older adults in Klang Valley. A total of 55 caregivers with a mean age of 34.78±13.46 years old participated in this study. A self-administered questionnaire was used to obtain information on the socio-demographic background of both caregivers and older adults, the knowledge, attitude and practices on geriatric malnutrition prevention and management. The mean duration of caregiving of caregivers was 2.76±1.36 years. The mean age of the older adults was 71.45±10.17 and the majority of the older adults (*n*=39, 70.9%) had more than 1 complication upon admission to the hospital in the past 1 year. The majority of the caregivers (56.4%) had moderate knowledge on geriatric malnutrition prevention and management, a moderately positive attitude toward transition care (3.42±0.99), and relatively low practices (29.33±9.38 from a scale of 63). This study highlights that caregivers have lack adequate knowledge on less evident aspects of malnutrition such as the nutrient requirement and actions to prevent and improve malnutrition and thus were not sufficient to promote good practices in caregiving. The transition malnutrition care guideline is needed to provide information on the roles and responsibilities of each entity within the Transition Care Programme. Future studies are suggested to focus on

cause and effect on transition malnutrition care as well as the readiness and expectation of caregivers on transition malnutrition care education.

A10 Darkness and screen light exposure: Its role in psychosocial factors among pregnant women in Kuala Lumpur

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Light exposure at abnormal timings has been associated with the disruption of circadian rhythm which causes the elevation of depression, anxiety, and stress (DAS) among pregnant women. This study is part of a prospective observational study among the MY-CARE cohort to determine the association of light exposure with psychosocial factors among pregnant women. A total of 117 pregnant women in their second trimester were recruited from government clinics and answered self-administered questionnaires for light and psychosocial factors assessment. The average duration in hours for sunlight exposure was 3.45±1.75, low intensity artificial light was 0.90±1.80, high intensity artificial light was 4.91±1.80, darkness was 7.51±1.81, while screentime was 6.75±4.68. Results showed that longer hours in darkness were associated with lower anxiety scores (r=-0.341, p<0.001) while longer hours in indoor natural light was linked with higher anxiety scores (r=0.236, p=0.014). Median DAS scores (6.00, 6) were lower in total darkness as compared to exposure to screen light in darkness (10.00, 10) from 12 a.m. to 3 a.m. (p=0.034). Stress scores were significantly different at 3 a.m. to 6 a.m. (p=0.046) between darkness (median score 6.00, IQR=8) and screen light in darkness (median score 10.00, *IQR*=11). Similarly, significant difference was observed in anxiety scores at 3 a.m. to 6 a.m. (p=0.024) between darkness (median score 6.00, *IQR*=6) and screen light in darkness (median score 11.00, *IQR*=13). Multiple linear regression showed that longer hours in darkness resulted in lower total DAS scores (β=-1.498, p=0.039). In conclusion, longer period in darkness had positive effect in psychosocial factors while screen light in darkness causes elevated DAS levels. Future studies can be conducted to explore the role of environmental light with hormonal levels among pregnant women and its implication to fetal programming.

A12 Healthy eating index and abdominal obesity among aboriginal children in Negeri Sembilan

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Healthy Eating Index (HEI) is one of the commonly-used indicators for assessing dietary quality. Better dietary quality is known to be protective towards obesity however there is a continuing need to examine the relationship between the HEI and abdominal obesity especially among aboriginal children. This study aims to determine the relationship between HEI and abdominal obesity among aboriginal children. An analytical cross-sectional study was conducted among primary school aboriginal children aged 7-12 years old in Negeri Sembilan and their respective parents. The HEI score (HEIs) and HEI component scores (HEIcs), were calculated based on diet data from Semi-quantitative Food Frequency Questionnaire (SFFQ). Waist circumference (WC) was obtained and compared to WC percentiles chart and cut-off points to determine the abdominal obesity status. All data was

analysed using SPSS. The prevalence of abdominal obesity among aboriginal children was 18.7%. According to HEI, 49% of children had diet that requires improvement (ΣHEIs<80). Girl was significantly associated with abdominal obesity (χ^2=4.192, p=0.041). Children aged 10-12 years old have significantly larger waist circumference (t=-6.641, p<0.001); higher HEIcs for legumes (t=-2.378, p=0.020) and dairy (t=-3.586, p<0.001). Compared to girls, boys have significantly higher HEIcs for meat, poultry and eggs (t=0.424, p=0.003). The ΣHEIs (t=-2.008, p=0.046) and HEIcs for fruit intake (t=-2.259, p=0.025) was significantly higher in children from family with household size >5 members. Children lived with single parents had significantly higher HEIcs for fruits (t=4.360, p<0.001), meat, poultry and eggs (t=2.845, p=0.005) and fish and seafood (t=5.027, p<0.001); but significantly lower HEIcs for legumes (t=-0.363, p=0.013). Temuan children had significantly higher HEIcs for cereal (t=0.558, p=0.036) and legumes (t=2.751, p<0.001) whereas Semelai/ Jakun (t=0.019, p<0.001) children had significantly higher HEIcs for meat, poultry and eggs. No significant relationship was observed between waist circumference and HEIs. HEI provide comprehensive assessment of diet quality; however, not in relation with abdominal obesity among aboriginal children. Longitudinal studies are needed to evaluate whether HEIs predicts risk of abdominal obesity among aboriginal children.

A13 Association between body image dissatisfaction and eating disorder among UCSI University students

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The prevalence of eating disorders has become widespread and continues to rise throughout the last two decades which results in severe comorbidities that have substantial impact on the quality of an individual's life. The aim of this study was to identify the association of eating disorder, body image dissatisfaction and weight status among UCSI University students. A cross-sectional study was conducted through online platforms such as Facebook, WhatsApp and UCSI Course Networking platform. The questionnaires used in this study were Eating Attitude Test (EAT-26) and Body Shape Questionnaire (BSQ-34). Anthropometry measurements taken were weight and height. There were a total of 185 students and majority of the participants were female Chinese (63.8%) with age range of 18-25 years old. Most students had normal BMI (21.4±3.8) with a total of 93 students (50.3%) with normal BMI, 39 students (21.1%) were underweight, 26 students (14.1%) were overweight and 27 of them (14.6%) were obese. The mean score for BSQ-34 was 105.45±18.34 with 34 respondents (18.4%) of them marked high concern with their shape, 46 respondents (24.9%) showed moderate concern with shape, 40 respondents (21.6%) have mild concern with shape and lastly only 65 respondents (35.1%) with no concern with shape. More than half of the respondents had body concern which leads to body image dissatisfaction. The mean score of EAT-26 obtained was 15.45±9.95 and there was no significant gender difference associated with body image dissatisfaction and eating disorder were found in this study. The results showed no correlation between body image dissatisfaction and eating disorder (r= -0.878, p=0.851). In conclusion, majority of the participants had lower risk or no risk of eating disorders but they have mild body image satisfaction levels. Further research can be done including other variables that influence body image dissatisfaction among University students.

A14 Association between community and consumer food environment with Body Mass Index (BMI) status among adolescents aged 13 to 17 years in Sandakan, Sabah

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This study aimed at determining the association between the community food environments (Distance of food outlets, number of food outlets within residential area), and consumer food environment (Price of food items in the food outlets, availability of healthy food items in the food outlets) with Body Mass Index (BMI) status among adolescent aged 13-17 years old. Measurement data on the weight and height of 203 adolescents who lived in Sandakan (82 boys, 121 girls) were obtained from the self-reported questionnaire via Google Form and the BMI was classified using the Classification of BMI-for-age (z-score) for children aged above 5 years old. Quantum Geographic Information System (QGIS) was performed to determine the distance and number of food outlets within 1000 m radius from the adolescent residential address. Besides, the validated observational tools (Nutrition Environment Measures Survey for Stores (NEMS-S) and Nutrition Environment Measures Survey for Restaurants (NEMS-R)) were used to identify the scores of prices and availability of healthy food items in the food outlets. Chi-square of Independence and Pearson Moment Correlation test were conducted to examine the association between the distance of food outlets from residential area, numbers of food outlets (none or more than one outlet), price of food items in the food outlet scores, availability of healthy food items in the food outlet scores with BMI-for-age of the adolescents with adjustment for age, gender, ethnicity, parental monthly household income, parental educational level, and parental BMI status. As a result, it showed that the majority of the adolescents BMI-for-age was categorized as normal (70.4%), followed by overweight (27.6%) and thinness (2.0%). Besides, there was no significant association between the distance of food outlets from residential areas with BMI status of the adolescents, except for restaurants (p=0.04) and fast foods (p=0.006). Moreover, there is no significant association between the numbers of food outlets within the 1000m residential area with BMI status of the adolescents, except for the convenience store (p=0.004), fast food outlets (p=0.000) and restaurant (p=0.000). Both price and availability of food items in the food outlets had significant positive correlation with BMI status of the adolescents. The study suggests that limiting the number of fast-food outlets and restaurants in residential areas could have a significant effect in reducing the prevalence of overweight and obesity among adolescents. Most important, lower prices and higher availability of healthy food items in the food outlets were associated with better BMI status.

A15 Association between stress level, sleep quality and eating behaviours among university students

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Transition into university life is a critical period for young adults, where they gain independency and experience some substantial life changes. They are making their own decisions in food choices, sleeping time and social activities, which may indirectly influence their health. This study was carried out to investigate the relationship between stress level, sleep quality and eating behaviour among university students in Malaysia. The study was conducted among 172 Degree university students (122 females, 50 males),

aged 18-25 years. The self- administered questionnaire was created in Google Form and distributed to participants via online using convenient and snowball sampling method. Perceived Stress Scale (PSS-10), Pittsburg Sleep Quality Index (PSQI), and Dutch Eating Behaviour Questionnaire (DEBQ) were used to determine stress level, sleep quality and eating behaviour of students respectively. Majority of the participants were Chinese female students with a mean age of 21.77±1.691. The mean total PSS score of the participants was 20.74±5.324. The sleep quality of the participants was generally good with a mean global PSQI score of 6.21±2.920 and the mean of the DEBQ score was found to be 85.59±18.42. A significant gender difference found in eating behaviour among individuals (t=2.048, p=0.042). There was a weak significant positive correlation between eating behaviour and stress level (r=0.207, p=0.007), but not significant for sleep quality. Prevalence of stress among students was 78.5% and students have fairly good sleep quality. In conclusion, students tend to have abnormal eating behaviours when they were experiencing higher stress level and this may negatively affect their health consequently. Stress management intervention and healthy diet programs should be implemented in university to increase the health awareness among university students.

A16 An online survey of association of sociodemographic factors and nutritional status with type 2 diabetes risk among a sample of Malaysian adults

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The prevalence of undiagnosed diabetes in Malaysia had increased over the past decades. Therefore, it is important to evaluate T2DM risk for earlier prevention of T2DM. This cross-sectional study aimed to determine T2DM risk and its associated factors among a sample of Malaysian adults. This online survey used a self-administered questionnaire to assess sociodemographic factors and self-reported anthropometric measurements. The Singapore Short Diet Screener and Finnish Diabetes Risk Score questionnaire (FINDRISC) were used to assess dietary intake and T2DM risk score. A total of 191 respondents (49 males, 142 females) with a mean age of 30±9 years old participated in this study. About 39.2% of the respondents had elevated T2DM risk, with 4.7% had high risk. Also, 46.1% of the respondents had a family history of diabetes. Percentages of respondents with overweight, obesity and abdominal obesity were 20.4%, 13.6% and 30.4% respectively. The mean energy intake of respondents was 1384 kcal/day. The mean carbohydrate intake of respondents exceeded the recommended intake while the mean fat, total dietary fiber and food group intakes were lower than recommended. T2DM risk was significantly associated with increasing age (r=0.325, p<0.001), being female (p=0.001), of Malay ethnicity (p<0.001), being married (p<0.001), increasing household income level (r=0.158, p=0.029), having family history of diabetes (p<0.001), increasing weight (r=0.526, p<0.001), increasing BMI (r=0.631, p<0.001), abdominal obesity (p<0.001), decreasing bread, cereal and cereal products intake (r=-0.177, p=0.019), decreasing non-starchy vegetable intake (r=-0.164, p=0.023), increasing fats and oils intake (r=0.156, p=0.031), increasing tea and coffee intake (r=0.307, p<0.001), seldom/never eating at other restaurant (p=0.030) and used palm oil for home-cooked food (p=0.011). The risk factors identified in this study require attention from the healthcare professionals to prevent the high-risk population from developing T2DM in the next 10 years.

A17 Assessment of availability of sport facilities and recreational resources in a state of Penang

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The association between the build environment and the sport engagement is showed to be promising on maintaining general and optimal general health outcomes for all populations. To fill this research gap, the pattern and availability of sport facilities and recreational resources were accessed based on districts in Penang. Sport facilities and recreational resources in Penang were collected mainly using Google Maps and Google Street View, and recreational resources were classified according to the area measured in QGIS. The relationship between the availability of sport and recreational resources, and population size were determined using SPSS software. A total of 1609 facilities, comprised 16 sport facilities and 7 recreational resources were collected from five (5) districts in a state of Penang. Of these sport facilities and recreational resources, about 88.6% are considered as public-based, whereas about 11.4% were owned by private-based organizations. Sport and recreational facilities in public setting tended to be 8 times higher compared to private-owned facilities, with ratio of 8:1. In general, recreational resources (61.0%) had found to be higher than the total sport facilities (39.0%) in all districts in Penang. There were 84.3% of sport facilities and recreational resources located in urban areas of Penang, while 15.7% located in rural areas. For service population ratio, one facility served for 527 to 1490 individual. A significant positive association between the sport facilities (r=0.802, p<0.01) and recreational resources (r=0.756, p<0.01), and total population sizes was found in the present study, regardless of the districts assessed. Central Seberang Perai has recorded the highest numbers of total and public-based sports and recreational facilities located in urban areas. The availability of sport facilities and recreational resources were significantly and proportionately related to the total residents in Penang, but the types of sport facilities available varies across five districts in Penang.

A18 The associations of knowledge on nutrition, attitude on gestational weight gain, cultural beliefs (food taboos) practice with gestational weight gain among Malay pregnant women in Malaysia

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Gestational weight gain (GWG) is defined as the difference between the last available antenatal weight and pre-pregnancy weight. Excessive and inadequate GWG are associated with multiple chronic diseases and complications. There are mixed findings on several factors that were found to contribute to GWG status. Hence, this cross-sectional study aimed to determine the associations between knowledge on nutrition, attitude on gestational weight gain, cultural beliefs (food taboos) practice and GWG among Malay pregnant women in Malaysia. A set of self-administered questionnaire that assess sociodemographic background, knowledge on nutrition, attitude on GWG, cultural beliefs (food taboos) practice during pregnancy as well as self-reported anthropometry data on pre-pregnancy BMI and total GWG were completed by respondents. All the data were analysed using IBM

SPSS Statistics. A total of 100 pregnant women with a mean age of 29.95±4.76 years, mean parity of 1.27±1.16 and mean gestational age of 38.58±0.82 weeks, were recruited in this study. A total of 51.0% of the respondents had abnormal pre-pregnancy BMI, which 38.0% were overweight and obese and 13.0% were underweight. Meanwhile, most of the respondents were classified as having inadequate gestational weight gain (44%), followed by excessive gestational weight gain (29%). Majority of the pregnant women had good knowledge on nutrition (78.0%), negative attitude towards GWG (91.0%) and did practice on food taboos during their pregnancy (50.0%). However, results showed that there were significant correlations between parity (r=-0.292, p=0.003), pre-pregnancy BMI (r=-0.246, p=0.014) and attitude on weight gain (r=-0.284, p=0.004) with GWG. Intervention programs that advocating on normal pre-pregnancy BMI and positive attitude towards weight gain during pregnancy are recommended among pregnant women to improve their total GWG status. Thus, this study provided the policy makers and healthcare professionals a better view of planning of future intervention.

A19 The relationship of food vlog viewing on social media with food cravings among youths

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The high usage of social media by the youths and the rise of unhealthy food advertisement in this current era has become one of the contributors to the high prevalence of obesity problems worldwide. Previous study found that food advertising was associated with the youth obesity. Eating problems occur when most of the foods reviewed made by influencers in vlogs are mostly unhealthy foods. The objectives of this study were to evaluate the current level of social media usage among youths, identified factors of food cravings among youths after watching food vlogs and to determine the relationship between the uses of social media with food cravings among youths. This study was a cross-sectional study conducted among youths aged 15 to 30 years old who study or live around Kuala Lumpur and Selangor. These youths need to have Instagram or Youtube social media accounts. Four food vlog videos with the highest number of followers and viewers were selected based on the rating showed in Socialblade and Hypeauditor websites. These food vlog videos were combined into a 9 minutes video. Participants were requested to watch the video before answering a set of questionnaires given via Google Form. Overall, the results showed that the usage of social media among youths was high (3.15±0.76). Factors influencing food cravings were psychological and cognitive factors such as food images and influencer's reaction. There was a moderate positive relationship (p<0.05) between the use of social media among youths with food cravings after watching the food vlogs. In conclusion, food vlogs is one of the strategies employed by influencers and food companies to influence youths to eat unhealthy food. Stricter regulation and legislation are needed by the authorities to control the promotion of unhealthy food on social media and encourage influencers to promote more healthy foods.

A20 Psychosocial factors as mediators to the relationship between food security status and academic performance among undergraduate students in Universiti Putra Malaysia

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Empirical evidences suggested that the increasing number of food insecurity become a threat to students' well-being and success. It is crucial to prevent food insecurity in order to produce a quality and productive future nation. The phenomenon of food insecurity, if not treated, could give big loss to nation due to its consequences which include psychosocial health and academic success. Therefore, this study aims to determine the potential mediators on the relationship of food security status and academic performance through psychosocial health (stress, anxiety and depression) among undergraduate students in Universiti Putra Malaysia (UPM). This cross-sectional study was conducted among participants (n=663) involving seven randomly selected faculties in UPM. An online self-reported questionnaire was used, comprised of socio-demographic backgrounds, 10-item U.S Adult Food Security Survey Module and Depression, Anxiety and Stress Scale (DASS-21) and Cumulative Grade Point Average (CGPA) for academic performance. Results indicate that majority of respondents were female (63.6%), Malay (68.5%), single (96.2%), not working part-time (94.9%), living inside campus (82.7%), financial aid recipient (91.4%) and had CGPA less than 3.75 for academic performance (88.6%). About 62.8% reported to have experienced food insecurity. The prevalence of stress (34.5%), anxiety (77.3%) dan depression (40.1%) was reported among respondents. Linear regression reveals that food security status associated with anxiety (B=0.288, SE=0.136, p<0.05), depression (B=0.460, SE=0.126, p<0.05) and GCPA (B=-0.018, SE=0.004, p<0.05) but not stress (B=0.207, SE=0.132, p>0.05). In the mediation analysis using PROCESS SPSS macro, it was found that food security status has an indirect effect on academic performance through anxiety and depression but not through stress. The result suggests that higher institutions especially student's affair division and counselling unit play important role considering organizing psychosocial health management session as an alternative to improve academic performance besides diminish food insecurity among students.

A21 Socio-demographic characteristics, nutritional knowledge, and perception of Front-of-Pack labels among university students

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Front-of-Packaging (FOP) is a summary of Nutrition Information Panel (NIP). It uses interpretational aides, such as interpretative words, colours and symbols to guide and attract consumers in using FOP. The usage of FOP may help the consumers to make informed decisions when purchasing foods in order to have a healthy diet that will reduce risk of diet-related diseases such as, obesity, hypertension, and diabetes. However, there is lack of evidence conducted locally related to the sociodemographic characteristics, nutritional knowledge and perceptions of FOP among university students. The objectives of this study were to determine the sociodemographic characteristics, nutritional knowledge,

and perception of front-of-pack labels among university students. This is a cross-sectional study involving 151 subjects from International Medical University (IMU) students. Participants were given a set of questionnaires which were adopted and modified based on a previous study. The results from this study show that majority of the respondents reported that they have "good" nutritional knowledge. About 68% of the respondents reported that they did not use FOP during food purchases, nevertheless, they understood the messages of FOP. There is weak correlation between the nutritional knowledge and the perceptions of consumers towards FOP. Though the nutritional knowledge of the University students is good, yet they did not use the FOP to make healthier choices. The university students should be made aware of making healthier choices by using the FOP.

A22 Factors associated with stunting among 2- to 5-year-old urban poor children living in low cost-flats at Kuala Lumpur

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Stunting remains a public health concern. There are increasing concerns that low-income families in urban are particularly vulnerable to stunting. Therefore, this study aimed to determine the factors associated with stunting among urban poor children aged 2 to 5 years old living in low-cost flats at Kuala Lumpur. A total of 52 children (48.1% males and 51.9% females) with their mothers participated in this study. Information on sociodemographic characteristics, breastfeeding practice, food insecurity, second-hand smoke exposure and anthropometry data were completed by the mothers using an online questionnaire. Findings showed that stunting prevalence in children aged 2 to 5 years old in this study was 28.8%. Female children (p=0.020), mothers with short stature (p=0.023), fathers who smoked (p=0.025) and children who exposed to second-hand smoke (p<0.001) showed higher risk of becoming stunted. However, there were no significant associations between ethnicity, parental marital status, parental education level, monthly household income, father's height, birth weight, breastfeeding duration and food security with child stunting (p>0.05). Immediate and appropriate interventions targeted at urban poor children are needed, particularly in addressing second-hand smoke exposure. Family member who smoke is encouraged to quit smoking to maintain a smoke-free home environment that is beneficial to the nutritional and health status of children.

A23 Food security status and its coping strategies among households who received The Lost Food Project (TLFP) products in selected low-cost public housing area in Klang Valley

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The Lost Food Project (TLFP) is a non-profit organization who continuously working on their strategic plan in combating the food insecurity problem by distributing food surplus to low income households within Klang Valley. The objective of this study is to determine the associations with food security status and its coping strategies among households who received TLFP products in selected low-cost public housing areas in Klang Valley. A convenience sampling was carried out for this cross-sectional study and it involved a

total of 88 participants. A set of questionnaires was prepared, and the participants were interviewed either by phone, face-to-face or self-administered questionnaire. An independent sample *t*-test was used to compare the means of coping strategies score between food secure and food insecure households. Meanwhile, chi-square was used to determine the association between socioeconomic background, nutrition knowledge and food security status of households who received TLFP products. The prevalence of food insecurity among households in this study was 59.1%, and most of the participants have moderate (37.5%) and good (27.5%) nutrition knowledge. The majority of the participants were satisfied, felt that TLFP products were useful and significant towards their households; with 72.7%, 88.7% and 86.4%, respectively. The mean Malaysian Coping Strategies Index (MCSI) score was 20.40±19.82, with the most applied coping strategies were 'using less expensive food', 'allocating money to buy staple and less preferred food' and 'reducing the number of meals eaten in a day. Food insecure households with the mean MCSI score of 26.95±22.13 tend to adopt more coping strategies to mitigate the food insecurity problem compared to those food secure households with the mean score of 11.29±11.06. Moreover, the study also showed that households who rent their house (χ^2=7.593, p= 0.006), low household income (χ^2=4.910, p=0.027) and high monthly food and drinks expenditure (χ^2=9.208, p=0.011) were associated with the food security status among TLFP recipients. The study concluded that lower household income, higher food and drinks expenditure and those who rent the house have negative impacts on household's food security status. Thus, the situation forced them to applied more food-related coping strategies, in which could give impact towards their diet quality. Further research should be conducted on the effectiveness of TLFP in helping them to improve Malaysian's food security status.

A24 Factors associated with body mass index among students in engineering major of public university in Selangor

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Prevalence of overweight and obesity has always become a concern in the world and recent data shows that the prevalence has increased among young adults. However, studies among young adults, especially among university students, are still limited. Therefore, this study was carried out to assess the factors associated with body mass index (BMI) among university students. A total of 284 participants aged 18 to 29 years from the Faculty of Engineering and Built Environment of University Kebangsaan Malaysia participated in this cross-sectional study but only completed data from 274 participants were analysed. Data collected including participants' height and weight that were based on self-reported, participants' socio-demographic (age, gender, date of birth, ethnicity, year and course of study, family income and household number), psychological (stress, depression and anxiety) and lifestyle (sedentary behaviour, physical activity, smoking status and sleep quality). In this study, results showed that most of the participants, 63.9% (n=175) were Malay, 32.1% (n=88) first year students and 55.5% (n=152) of participants were from the M40 group of family income. Results also showed 8.4% (n=23) of the participants were overweight and obese respectively. There were significant correlations between family income and physical activity with BMI (r=-0.227; r=-0.273; p<0.001). There was also a significant mean difference between course of study with BMI (F=3.426; p=0.009) which showed that mean±SD of BMI was highest among Mechanical Engineering students (25.59±5.32 kg/m^2). The mean of BMI was higher (23.58±3.99 kg/m^2) among current/never smoke group compared to current smoker (22.10±3.73 kg/m^2). Sleep quality also showed a significant association with BMI classification (χ^2 = 19.485; p<0.001) which indicated that the percentage of good sleepers were higher among overweight (81.6%) and obese (65.2%) participants. No significant association was observed between age, gender, ethnicity, depression, anxiety, stress and

sedentary behaviour with BMI and BMI classification. This prevalence of overweight and obese was quite high among participants of this study. Health awareness and intervention programs should be done to prevent overweight and obesity among this group population, particularly during this current pandemic situation.

A25 Associations of socio-demographic factors, parental height, feeding practices and child eating behaviours with stunting among children aged 6 to 36 months in Malaysia

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Stunting can be defined as the condition whereby the child's height is too short for their age. Stunting in early life can have an impact on a child's cognitive, physical, psychosocial, and affective development. This cross-sectional study aimed to determine the associations of socio-demographic factors, parental height, parental feeding practices, and child eating behaviours with stunting among children aged 6 to 36 months in Malaysia. A total of 244 children and their parents from all states in Malaysia (50.8% boys and 49.2% girls), with a mean age of 15.56±8.46 months, were recruited through local government health clinics and social media groups that comprised parents. A set of online self-administered questionnaire on socio-demographic characteristics, infant and young child feeding (IYCF) practices, and child eating behaviours were completed by the parents of the children. Height of both father and mother were self-reported, and the child's height was acquired from their health record books. Results showed that the prevalence of stunting was 16.4% (Boy: 18.5%; Girl: 14.2%). Further, a higher percentage of short fathers (with height less than165cm) were associated with a higher prevalence of children that were stunting (53.1%) as compared to normal height fathers (14.4%) (x^2=4.421, p<0.05), whereby average height of fathers in the present study was 170.46±7.13cm. However, height of mother was not significantly associated with stunting among children (x^2=2.258, p=0.323). Bivariate analyses also showed that no significant associations between socio-demographic factors with stunting. No significant associations were found in terms of infant and young child feeding (IYCF) indicators and stunting. In conclusion, 16.4% children were stunted, and height of father was associated with stunting among children. Future studies need to explore more variables related to fathers to determine the factors associated with stunting in Malaysian children.

A26 Factors associated with anaemia among Orang Asli children aged 2 to 6 years old in Negeri Sembilan

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There is limited data available on anaemia status of the Orang Asli (OA) pre-school children. The aim of this cross-sectional study was to determine the factors associated with anaemia among OA children aged 2 to 6 years old in Negeri Sembilan. This study included 264 OA children (50.9% boys and 49.1% girls) with a mean age of 4.04 years (*SD*=1.21 years) and their mothers from 14 OA villages in Negeri Sembilan. Mothers were interviewed to obtain information on sociodemographic background, food security, sanitation and hygiene status as well as dietary intake of their child. Anthropometry measurements were measured. Capillary blood haemoglobin level was used to determine anaemia status of both OA children and mothers. Children were screened for parasitic infection using

stool samples. Data collection was conducted from April 2015 to January 2016. Findings showed that 21.6% and 38.3% of the children and mothers were anaemic, respectively. Approximately 28%, 34.9%, 6.4% and 35% of the OA children were underweight, stunted, wasted, and infected by parasites, respectively. Moreover, 8% of the mothers were stunted, 58.9% had abdominal obesity, and 61.7% were overweight and obese. Those OA children who were stunted (x^2=5.75, p=0.017), infected by parasites (x^2=8.35, p=0.004), low father's educational level (x^2=9.50, p=0.023), mothers with anaemic (x^2=12.95, p<0.001), not wearing sandal or shoes outside the house (x^2=7.82, p=0.005), not using soap during hand washing (x^2=5.88, p=0.049), did not achieve recommended intake for energy intake (x^2=6.04, p=0.014), Vitamin A (x^2=4.61, p=0.032), and iron intake from diet (x^2=5.66, p=0.017) were at risk of developing anaemia. In conclusion, good nutritional status as well as hygienic and sanitation status play important roles in determining haemoglobin level of OA children. There is a need to implement appropriate nutrition intervention to reduce anaemia problem among OA children.

A27 Factors associated with level of physical activity during Covid-19 among university student in UiTM Shah Alam

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This cross-sectional study aimed to determine the factors associated with level of physical activity during COVID-19 among undergraduate student aged 18-26 years. A sample of 171 students from Universiti Teknologi Mara Shah Alam (n=171; 37 males; 134 females) participated in this study. The respondents were selected by using a simple random sampling among students of the Faculty of Applied Sciences. A self-administered online questionnaire was used to gather information regarding their socio-demographic characteristics (age, gender, ethnicity), psychosocial factors (social support, level of stress, anxiety, and depression), environmental factors (home safety), sedentary lifestyle and physical activity level. Pearson Correlation analysis was performed to determine factors associated with physical activity levels. The majority of respondents (61.4%) were classified as having a low physical activity, followed by vigorous (28.7%) and moderate physical activity (9.9%). The findings of Pearson Correlation showed that there was a significant association between family support (r=0.247, p=0.001) and physical activity level. While there were no significant association between friend support (r=0.147, p=0.055), stress (r=-0.36, p=0.641), anxiety (r=-0.49, p=0.527), depression (r=-0.023, p=0.767), home environment (r= 0.010, p=0.899) and sedentary lifestyle (r=0.082, p=0.283) with physical activity levels. This study showed that family played important role and associated with physical activity level during this COVID-19 pandemic.

A28 Assessment of knowledge of mothers on stunting: A survey in Perak Tengah

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Stunting has negative consequences not only for the child's physical growth, but also for his or her cognitive performances. Stunting can be caused by a various cause, including inappropriate child feeding due to a lack of awareness about feeding babies and toddlers which can be avoided by mothers who are the primary caregivers for their children. This

study aimed to assess the level of knowledge among mothers regarding feeding infants and young children in relation to stunting problem. This was a cross-sectional study involving 106 mothers aged more than 18 years who lived in Perak Tengah district. The state of knowledge regarding infant and child feeding was evaluated using the knowledge section of the Food and Agriculture Organization (FAO) nutrition-related Knowledge, Attitude and Practice (KAP) questionnaire. Their total score was summed up and categorized into poor, moderate and high level of knowledge. Majority of the respondents scored higher level of knowledge which was 95.3% (n=101) while the other 4.7% (n=5) scored moderate level of knowledge. The findings demonstrated that there was a significant difference (p<0.05) in terms of knowledge level between secondary school and higher education among the mothers. Stunting knowledge among mothers 75.5% (n=80) were having a higher level of knowledge while the other, 24.5% of the mothers (n=26) were having a moderate level of knowledge. In conclusion, despite the higher prevalence of mothers who scored higher level of knowledge, it is still important for a mother to learn about this as the knowledge regarding feeding infants and children is very important to be acknowledged among mothers in prevention of nutritional problems in our country.

A29 A survey on the knowledge of proper breastfeeding practice and the existence of galactagogue food in habitual diet: A comparison between health science and non-health science female students

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Stunting is one of the silent pandemics that has affected 21.3% of the world population aged below 5 years. Breastfeeding is one of the practices that contributes to the reduction in rate of stunting prevalence. Food that contains galactogenic properties can be the alternatives to stimulate breast milk supply and prevent early cessation of breastfeeding. Hence, this study intended to assess and compare the level of knowledge among IIUM health and non-health sciences female students on the proper breastfeeding practice and the existence of galactagogue food in the routine dietary intakes. This was a cross-sectional study involving 110 IIUM female students where 54 of them were health science and 56 of them were non-health science students. Self-administered questionnaires were adapted from previous studies as research instruments. The results of the study indicates that on overall, 50% (n=55) of the respondents had poor knowledge on breastfeeding practice followed by 23.6% (n=26) of them categorised as having intermediate level of knowledge. Only 26.4% (n=29) of them met the mark of having high level of knowledge. Meanwhile, 63.6% (n=70) of the respondents were having poor knowledge on galactagogue food, 21.8% (n=24) in the group with intermediate knowledge and only 14.5% (n=16) met the knowledge score of higher level of knowledge. Among the respondents, the health science group (7.65±0.329) demonstrated significantly (p<0.001) better knowledge scores of breastfeeding practices compared to the non-health science group. Meanwhile, there is no significant difference for knowledge score on the galactagogue food, despite non-health science female students (4.70±2.456) attaining higher scores than health science female students (4.15±2.736). Prior exposure to accurate breastfeeding knowledge should be increased among female university students to ensure they are well-prepared for their motherhood journey and carry out proper breastfeeding practices in future.

A30 Associations of socio-demographic characteristics, parental feeding practices and child eating behaviors with rapid weight gain among Malaysian children aged 6 to 24 months

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Rapid weight gain is defined as a z-score change greater than 0.67 in weight-for-age between two different ages in childhood. Parental feeding practices and child eating behaviors may play a role in rapid weight gain. Previous researches have linked rapid weight gain in early childhood to the development of overweight and obesity. To date, there has not been a published study on socio-demographic characteristics, parental feeding practices, child eating behaviors, and their associations with rapid weight gain among Malaysian children aged 6 to 24 months. Thus, this cross-sectional study aimed to determine the associations of socio-demographic characteristics, parental body weight status and their feeding practices, and child eating behaviors with rapid weight gain among Malaysian children aged 6 to 24 months. A total of 214 children and their parents participated in this study. Information on socio-demographic characteristics, parental body weight status and feeding practices and child eating behaviors were completed by the parents. The Infant and Young Child Feeding (IYCF) Practices Questionnaire was used to assess the parental feeding practices. Child eating behaviors were assessed by the Children Eating Behavior Questionnaire (CEBQ). The parents' weight and height, as well as the weight of their children, were reported. The parents' current BMI and weight-for-age z-score changes (between birth and current age during data collection) were calculated. On a side note, this study provides an insight into the high prevalence of rapid weight gain among children which was 20.1% (Boys=19.6%, Girls=20.6%). Results showed that the educational level of mothers (x^2=4.326, p=0.038) and slowness in eating (r=-0.175, p=0.010) were significantly associated with rapid weight gain of the children. There were 76.7% of tertiary educational level mothers have rapid weight gain children. No significant associations of parental feeding practices and weight status with rapid weight gain. In conclusion, one in five of the children had rapid weight gain, whereby educational level of mothers and slowness in eating were associated with rapid weight gain. Future study is suggested to include other factors such as energy intake and bottle-feeding frequency that may be associated with rapid weight gain of young children.

A31 The associations of infant's health characteristics, feeding practices and lactation management with growth among infants with stridor

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Stridor is identified as an upper airway obstruction symptom that can vary in severity, with the prevalence of 78.5% that is caused by laryngomalacia in Malaysia. Disturbance in breathing, sucking and swallowing of infants with stridor during feeding could affect their growth. This study aims to determine the associations of infant's health characteristics,

feeding practices and lactation management with growth among infants with stridor referred to Otorhinolaryngology Department of Hospital Serdang and Hospital Ampang. A total of 153 mother-child dyads with child mean age of 3.14±1.2 years participated in this study. The consented secondary data were accessed through the hospital system (e-His) to collect data on infants' health characteristics and growth, while an interviewer-administered questionnaire was done with mothers through phone calls on data related to feeding practices and lactation management. Growth was calculated for weight gain rates (kg/week) and weight-for-age (WAZ) at 18 months. Nutritional status data shows that 95.4% were normal, while others were underweight (1.3%), severely underweight (0.3%) and possible growth problems (2.6%). The mean weight gain rate from weight at first referral for stridor up to the weight when the stridor resolves was 0.10±0.04 (kg/week). There were significant associations between all infant's health characteristics (e.g. birth outcomes, duration and severity of stridor) and WAZ, except age (r=-0.083, p=0.312). Feeding practices were significantly associated with WAZ except for the onset of cup feeding, while exclusive breastfeeding duration (r=-0.173, p=0.03) and age stopped breastfeeding (r=0.179, p=0.03) were significantly correlated with weight gain rates. For lactation management, only holding position (p=0.05) was associated with infant growth. Future research should focus on multifactors intervention including lactation management (such as holding and feeding positions) to assist feeding problems that can lead to non-exclusive feeding or faltering growth, specifically for mother-infants with stridor.

A32 The anthropometric changes across the years in university students who observed Ramadan fasting during semester period

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The objective of this study was to compare the anthropometric measurements (weight, height, and waist circumference) of university students before, during and after the Ramadan fasting period. It was hypothesised that Ramadan fasting on campus would have caused participants to lose weight. Observations were made when Ramadan coincided with semester period in the years 2009, 2019 and 2021. The 2021 study was conducted during the Movement Control Order for covid-19 mitigation. For each year, a random sample of students who observed the fast were recruited for this cross-sectional study. Participants (n=159) included university students from Universiti Malaysia Sabah who were aged 19 to 27 years (2009: 21 females; 2019: 8 males, 61 females; 2021: 10 males, 59 females). All participants observed the fast in Kota Kinabalu in all three studies. Most participants identified as Malay (52.1%), indigenous Sabahan (23.3%), and Muslim (87.3%). In each study, participants recorded their weight, height, and waist circumference for 1 week before Ramadan, during Ramadan and 1 week after Ramadan. For the three studies, there were slight decreases in weight and waist circumference during Ramadan, and slight increases in weight and waist circumference after Ramadan; however the differences between the three periods were statistically insignificant (p<0.05). The increase in weight one week after Ramadan might be due to the feasting week where there is usually an increase in number of meals, snacks and drinks during the first week of Syawal. Fasting during the Covid-19 pandemic did not produce a different pattern in anthropometric changes in before, during and after Ramadan compared to fasting outside of pandemic despite the lack of Ramadan bazaars in Sabah during the pandemic. In the 12 year time difference from the first to the third study, females' weight increased significantly (2009: 50.3±7.9kg; 2019: 58.1±13.6kg;

2021: 54.6±11.0kg; p=0.025). In conclusion, there were no significant changes in weight and waist circumference due to changed eating habits for those observing Ramadan on campus. These findings suggest that energy balance was probably not significantly different between before, during and after Ramadan. Further analysis on total energy intake and physical activity could be conducted in the future.

A33 Associations between vitamin D-related factors (dietary, supplement usage and sun exposure level) and haemoglobin concentration among female students in Universiti Putra Malaysia (UPM)

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Vitamin D deficiency has been shown to lead to reduced iron absorption due to the upregulation of hepcidin hormone resulting in anaemia. However, it remains unclear whether dietary, vitamin D supplement intakes and sun exposure level are associated with haemoglobin (Hb) concentration. This cross-sectional study was carried out to investigate the associations between those factors and Hb concentration among 155 female students aged 19-26 years (22.40±1.34). A set of questionnaires was used to determine the socio-demographic characteristics and anthropometric measurement were performed. Dietary vitamin D intake and supplement usage were determined using the Food Frequency and Lifestyle Questionnaire whilst sun exposure level (SEL) was determined using a SEL questionnaire and reported as Sun Exposure Index (SEI). Hb concentration was assessed using HemoCue© Hb 201+ Analyzer and anaemia was defined using WHO cut off points of <12g/dl. Pearson and spearman correlation were used to determine the associations between vitamin D-related factors and Hb concentration where appropriate with level of significance set at p<0.05. Anaemia prevalence was 38.7%, with a mean±SD Hb concentration of 12.10±1.38 g/dl. Mean±SD dietary and supplemental vitamin D intakes were 8.10±5.08µg/day and 13.56±6.38µg/day, respectively. SEL/week was 2.08±1.11 hours with BSA fraction of 0.30±0.22 and SEI of 2.50±1.46. The study found associations between dietary vitamin D intake (r=0.28, p=0.01) and vitamin D supplement use (r=0.40, p=0.019) with Hb concentration. However, no significant association was observed between the SEL, BSA fraction and SEI with Hb concentration, which may be due to the fact that the SEL and SEI were considered low in overall. This study demonstrates that increased in dietary and supplements vitamin D consumption led to improved Hb concentration but warrants further investigations.

A34 An online survey of sociodemographic factors and nutritional status of women with and without a history of gestational diabetes mellitus in Malaysia

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Gestational diabetes mellitus (GDM) is a disease that affects up to 28% of pregnant women globally. Malaysia is not spared from these issues, with a prevalence rate of 18.3%. Previous

studies showed inconsistent findings regarding the association of a history of GDM with sociodemographic factors, obstetric history, nutritional status, and type 2 diabetes mellitus (T2DM) risk among women with and without a history of GDM. The current COVID-19 pandemic limits the collection of data as it is harder to conduct face-to-face interviews. Therefore, this study aimed to compare sociodemographic factors, obstetric history, nutritional status and T2DM risk among women with and without a history of GDM in Malaysia through an online survey. A comparative cross-sectional study was conducted among 69 subjects (mean age: 38.5±8.3 years, mean BMI: 25.4±5.1 kg/m^2). A self-developed questionnaire was generated to assess the sociodemographic factors, anthropometry data, and obstetric history. Singapore Diet Screener was used to assess the food intake, and Finnish Diabetes Risk Score (FINDRISC) was used to assess T2DM risk. The proportion of women with a history of GDM was 37.3%. Women with a history of GDM were significantly younger at the current age (p=0.001) and age during last pregnancy (p=0.003) and had a lower monthly household income (p=0.022). They had lower sugar (p=0.001), total fibre (p=0.034), non-starchy vegetable (p=0.001), legume and legume products (p=0.029), and fruits (p=0.001) intakes, as well as had less tendency to ask for low sugar beverages and had a higher T2DM risk (p=0.001) than women without a history of GDM. Modifiable risk factors such as food intake and dietary behaviour deserve closer attention by healthcare providers. Therefore, nutritional education should focus on women with a history of GDM as they are at a high risk of developing future T2DM.

A35 Nutritional status, iron status and cognitive performance in children from Ranau, Sabah

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The objective of this study was to investigate cognitive performance, blood haemoglobin levels, helminthic infestations in children aged 6 months to 12 years in the district of Ranau, Sabah which is home to the UNESCO World Heritage Site. It is well established that low blood haemoglobin levels were associated with less optimum cognitive performance. Eligible participants and their parents from eight villages: Nalapak, Perancangan, Kauluan, Pinawantai, Kiwawoi, Toboh Baru, Tamalang and Lingkudau were invited to participate. Informed consent was obtained prior to their participation. A total of 157 participants provided anthropometric measurements and dietary data, out of which 30 participants (19%) also provided one finger prick haemoglobin measurement and one stool sample. Cognitive performance was assessed using a Draw-A-Person-Intellectual-Ability Test for children which was conducted online due to covid-19 mitigation considerations. Findings showed that 20% of children had BMI-for-age <-2SD (thinness), 15.6% overweight and 17.3% obese. They were more study participants who were thin, overweight, and obese compared to a nationally representative study of Malaysian children (Nik Shanita *et al*., 2018). A preliminary analysis of food group intake showed that all children consumed fruits and vegetables, rice, meat/poultry/fish every day. Mean haemoglobin was 11.6±1.4g/dL, which was on the lower range for young children. Higher haemoglobin levels showed a positive trend with better cognitive performance, however the association was not statistically significant (r_s=0.22, p=0.243). 100% of participants were infected by *Ascaris lumbricoides* and 20% by hookworms. Future work will involve other villages in the district, nutrient intake analysis, and prevalence of diarrhoeal diseases and their association with nutrition status. The findings of this study shall form the basis for policy recommendations for sustainable development in a geopark area. This study was funded by UMS Grant SDK0097-2019.

A36 Factors associated to adherence to antiretroviral therapy among HIV adults at Ahmadu Bello University Teaching Hospital Zaria Nigeria

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The human immunodeficiency virus (HIV) is a virus which damages an infected person's immune system. Adherence to antiretroviral therapy (ART) is an important predictor of survival among HIV/AIDS adults. However, studies reported that there are factors associated to non-adherence among HIV adults. These variety of elements differs depending on the environment. A cross sectional study was aimed to determine the factors associated to adherence to ART among adults living with HIV on ART at Ahmadu Bello University Teaching Hospital Zaria, Kaduna State, Nigeria. Simple random sampling method has been used to select the adults and self-administered questionnaires on demographic, food security, BMI, diet diversity, beliefs and patient preference for medicine and limited availability and accessibility of ART and adherence to ART was completed by the respondents. Chi-square and binary logistic regression analysis were used to determine the factors associated to adherence to ART among HIV-infected adults. Overall, 385 respondents were involved, in which 67.5% were female and 32.5% were male. Half of the respondents were aged 49-64 years old (50.9%), about 44.9% of the respondents attended tertiary level of education. Majority of the respondents (87.0%) displayed low food security. More than half of the respondents (52.5%) were within the normal BMI classification and 40.3% were over-weight. Most of the respondents (74.8%) displayed moderate diet diversity. Most of the respondents (75.3%) were unsatisfied with the health-care service. More than half of the respondents (55.8%) have weak perceptions of personal need for the medication and 42.3% of the respondents had stronger concerns about the potential negative effects of the medication. Results showed that 54.0% respondents were adherence to antiretroviral (ARV) medication. Significant association was found between age (χ^2=9.179, p<0.01), education (χ^2=8.458, p<0.01), diet diversity (χ^2=10.255, p<0.01), food insecurity (χ^2=11.446, p<0.01), respondent's beliefs (χ^2=12.812, p<0.05) with adherence to ART. Multiple logistic regression revealed that respondents who were food insecure were 1.2 times more likely to be non-adherence to ART (AOR=1.220, 95% CI:1.642, 2.319). Respondents who had low dietary diversity were 1.7 times more likely to be non-adherence (AOR=1.792, 95% CI:1.023, 3.139) and respondents who had less perceptions of personal need for the ART were 1.5 times more likely to be non-adherence to ART (AOR=1.525, 95% CI:1.958-2.427), respondents who had strong concerns about the potential negative effects of the ART medication were 1.3 times likely to be non-adherence to ART (AOR=1.362, 95% CI:1.751-2.005). In conclusion, the prevalence of adherence to ART was low among the respondents. Factors associated to adherence to ART identified in this study were food insecurity, dietary diversity, patient belief. As a result, improved food security can lead to better adherence to treatment and care recommendations, intervention studies are needed to figure out how. And also, health care providers and HIV control programme implementers must consistently stress and encourage excellent adherence. Health care personnel need to be aware of these concerns and the belief of the respondents towards medicine and direct patients' education and intervention to reduce non-adherence.

A37 Diet quality and other factors influencing body weight changes during COVID-19 pandemic among low-income adults in Selangor, Malaysia

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Both modifiable and non-modifiable factors can contribute to the fluctuation of body weight. The outbreak of the COVID-19 pandemic had altered the lifestyle and brought along the new norms since 2020. In Malaysia, the implementation of the Movement Control Order (MCO), hit the economy harshly and therefore affected the low-income adults or the B40 households the most. With such, this cross-sectional study aimed to determine the associations between sociodemographic factors, lifestyle factors, emotional factors, and body weight changes during the COVID-19 pandemic among low-income adults. A total of 142 respondents were included in the analysis with the majority of them were female, Chinese, and students at the mean age of 28.73±8.26 years. About 84.4% of the respondents (n=141) experienced weight changes during this pandemic with more than half of them (51.1%) gained weight while another 33.3% of them lost weight. It was found that age (r=-0.226, p=0.007) and gender (x^2=11.000, p=0.004) were significantly associated with body weight changes at which female who was at a younger age tended to experience weight change. Meanwhile, 'fruits' (r=-0.200, p=0.026) and 'sugar-rich foods' (r=0.317, p=0.038) from the diet quality index had found to be significantly correlated to the overall body weight changes and weight loss respectively. Stress was also significantly and positively correlated with overall body weight changes (r=0.180, p=0.045); a significant correlation was found between stress and 'sugar-rich foods' score (r =-0.209, p=0.020). In conclusion, majority of the respondents experienced weight change during the pandemic. Those who were females, at a younger age, consumed fewer fruits and more sugary fruits as well as in stress were more likely to experience either weight gain or weight loss.

A38 Relationship of mother's working status with nutritional status of children from South East Asian Countries: A review

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Malnutrition in children is a major challenge in South East Asian Countries and is related to a variety of social and economic conditions. The objective of this review was to study the relationship of mothers' working status with nutritional status of children from these selected countries. Relevant studies were searched from 3 databases, viz., PubMed, Science Direct and Web of sciences in April 2021. Medical subject headings (MeSH) the National Library of Medicine were used to select the appropriate search terms. Inclusion criteria for selection of studies were as follows: studies published between January 2010 to February 2021, among children between age group 6 months to 12 years, explored the relationship of mothers' work with at least one indicator of child nutritional status (i.e., stunting, wasting, undernutrition, overnutrition, obesity) and in English Language were considered. Duplicate studies were eliminated; title abstract and full text screening was conducted using the Covidence Software. A total of 10247 records were identified and after removing duplicates, 2610 articles were shortlisted. Out of 2610 articles 13 studies met to the inclusion and exclusion criteria. Quality of these 13 studies was checked using

STROBE guidelines for observational studies. These studies were from Bangladesh (*n*=2), India (*n*=5), Myanmar (*n*=1), Nepal (*n*=3) and Sri Lanka (*n*=2). Of 13 studies, only one study reported a positive association of mothers' employment with height-for-age of children whereas 3 studies reported no association between child nutritional status and working status of the mother. Results from the remaining 9 studies indicated negative effects of mothers' working status on the nutritional status of children. Identifying the real challenges faced by working mothers and paying attention to appropriate child care is crucial for their children's good nutritional status.

A39 Food neophobia and its association with weight status among preschoolers in Terengganu, Malaysia

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Food neophobia is known as the attitude towards foods, including reluctance to eat and avoiding trying new food, resulting in restricted eating habits. There is a link between food neophobia and weight status, however there is a lack of articles and research conducted in Malaysia regarding food neophobia. Therefore, the aim of this study is to determine the association between food neophobia and preschoolers' weight status in Terengganu. This study was a cross- sectional study carried out among preschoolers in Terengganu. There were 126 preschoolers (36.5% were 5 years old; 63.5% were 6 years old) participating in this study. Data on sociodemographic, food neophobia were collected using questionnaires through Google Form while height and weight data were collected during the school visits. Child food neophobia was measured using the Child Food Neophobia Scale (CFNS) that consists of 10 items of which 5 items were reverse coded to calculate the CFNS score. Response options were rated using a 5-point Likert scale; response options ranged from strongly disagree to strongly agree. High mean scores of food neophobia indicate a high level of food neophobia. The cross-sectional associations between total CFNS score and Body Mass Index (BMI) Z-score were examined via simple linear regression test. The results of the study show that 80.2% of the participants were female, all Malays and 85.7% were living in urban areas. The median for the BMI Z-score was -0.66±1.52 with 78.6% of preschoolers had normal body weight, while 13.4% of them were overweight and obese. The results show that 62.7% of the participants experienced food neophobia while 37.3% of them were not having food neophobia. There was no significant association between BMI Z-score and CFNS score. Results highlight the need for interventions to educate parents on strategies to overcome neophobia and enable health professionals to improve children's nutrition and health in the future.

A40 Food security and its association with children's eating behaviour during the Movement Control Order

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The Federal Government of Malaysia has implemented the Movement Control Order (MCO) to curb the spread of COVID-19 virus. It is speculated that job and income losses during the enforcement of MCO may heighten the risk of food insecurity. Therefore, this study aimed to investigate food security and its associations with eating behaviour of Malaysian children during MCO. A total of 145 parents of children aged 2 to 11 years old were

recruited into this study using a combination of purposive and snowball sampling method. Parents were required to fill up a web-based survey consisting of socio-demographic characteristics, Radimer/Cornell Hunger and Food Insecurity Instrument and Child Eating Behaviour Questionnaire (CEBQ). Data analysis were conducted using IBM SPSS version 26. Independent sample t-test was used to investigate mean difference, while the correlation between food security and children's eating behaviour during the MCO was assessed with Point Biserial Correlation test. The prevalence of household food security was 64.8%, while the prevalence of child hunger was 29.6%. Children living in food insecure households had significantly higher (p<0.05) enjoyment of food (EF), emotional overeating (EOE), food responsiveness (FR) and emotional undereating (EUE) mean scores than its counterpart. On the contrary, children living in food secure households attained a significantly higher (p<0.05) score in slowness in eating (SE). Current findings showed that there was a significant moderate positive correlation (r_{pbis}=0.333, p<0.05) between household food insecurity and food approach behaviour.All in all, the prevalence of household food insecurity and child hunger were higher during the MCO. Children from food insecure households attained a better mean score in food approach behaviour in the time of COVID-19 pandemic.

A41 Diet quality and factor associated with body mass index among children with learning disabilities in Kelantan, Malaysia

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Evidence suggests that children with learning disabilities (LD) have unhealthy body weight status (BWS) and poor dietary pattern. A cross-sectional study was conducted to determine diet quality and factors associated with body mass index (BMI) of LD children. This study recruited LD children who attend the Special Education Integration Program from nine schools located in districts with high, moderate and low socioeconomic status in Kelantan. Parents completed a Malay language self-administered questionnaire on socio-demographic, food frequency questionnaire and comprehensive parental feeding practices. Height and weight of children were measured by researcher to determine BWS. Diet quality was assessed using the Healthy Eating Index for Malaysians. Multiple linear regression analysis was applied to test the research hypothesis. A total of 259 children with LD aged 10.54±1.69years (68.0% males, 32.0% females) participated in this study. Their BMI was 18.38±4.79kg/m^2; males (18.79±4.76kg/m^2) had significantly higher BMI than females (17.52±4.77kg/m^2), p=0.046. The prevalence of underweight, thin and severely thin were 11.9%, while 28.1% were overweight and obese. The diet quality scores was 48.15±9.23%, where 40.5% were at risk of poor diet quality. The total amount of daily energy intake was 1831.96±542.15 kcal with a mean carbohydrate intake (241.80±74.75g), protein intake (76.10±25.54g) and fat intake (63.42±21.33g). Parental feeding practice including pressure to eat (β=-0.282), restriction of weight control (β=0.351) and modelling (β=-0.162), child age (β=0.222), and childbirth weight (β=0.137) were significantly associated with BMI (R=0.561, R^2=0.315; F(5,217)=19.972, p<0.001). The prevalence of poor diet quality and overweight/obesity were high among LD children. Establishing nutrition and health-related intervention programmes with the parent's involvement may help to prevent further rise of overweight/obesity.

A42 Prevalence and associations of malnutrition, anaemia and micronutrient deficiencies among underprivileged rural primary school children in Malaysia

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Malnutrition leads to impaired growth, increased risk of infection, impaired cognitive function, and premature death among children. This study aims to determine the prevalence and associations of malnutrition, anaemia, vitamin A deficiency (VAD), iron deficiency and iron-deficiency anaemia among underprivileged rural primary school children in Malaysia. This cross-sectional study is a baseline assessment of a randomised clinical trial among primary school children from 10 primary schools in rural areas of 5 different states (Pahang, Perak, Johor, Sabah and Sarawak) in Malaysia. Fasting blood samples were collected for biochemical analysis and anthropometric indices were computed using *anthro* R-package provided by the World Health Organization (WHO). A total of 776 (379 boys and 397 girls) children aged 7 to 11 years, with complete anthropometric and biochemical data were included in this analysis. The mean age of the children was 9.10±1.39 years. Median z-score of weight-for-age (WAZ), height-for-age (HAZ), and BMI-for-age (BAZ) were -1.36 (*IQR*=-2.25 to -0.37), -1.59 (*IQR*=-2.32 to -0.85) and -0.40 (*IQR*=-1.03 to 0.48), respectively. Based on WHO growth standards, 414 children (53.4%) suffered from malnutrition, with the prevalence of underweight, stunting, thinness and overweight at 30.5%, 34.9%, 4.8% and 15.5%, respectively. The prevalence of anaemia, confirmed VAD, iron deficiency and iron-deficiency anaemia were 14.9%, 20.6%, 12.8% and 6.1% respectively. The present study found that anaemia, VAD, iron deficiency and iron deficiency-anaemia are positively associated with underweight and stunting status. In conclusion, malnutrition, anaemia and micronutrient deficiencies are still public health concern among underprivileged rural primary school children in Malaysia. Thus, these data highlight the urgency for multi-agencies' involvement in various nutritional intervention programs among children to work in partnership, through data sharing and consolidation of resources so that these efforts will be more impactful through inclusive initiatives.

A43 Knowledge, attitude and practice (KAP) on food label among Universiti Tunku Abdul Rahman (UTAR) students Kampar campus

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Food label is a communication vehicle between consumers and the producers by giving the important information of a food product. Nonetheless, the association between KAP and food label use, also any related evidence are insufficient data. The aim of this study was to determine the different of KAP level between gender and investigate the KAP level on nutrition information among UTAR Kampar students. A cross-sectional survey was

conducted online to recruit university students in UTAR Kampar campus. The period of conducting this study was from October 2020 until October 2021. A total of 183 respondents were volunteered to take part in this survey by filling the Food Label Use Questionnaire (FLUQ) which consists of sociodemographic, knowledge level towards nutrition and food, attitude and practices associated with food label use. Mann-Whitney test was used to test the different of KAP between gender and Fisher's Exact test was used to determine the association of KAP on food label used by using the 95% of significant level (a=0.05). The study shows that the majority students were high nutrition knowledge level (56.8%), attitude on expiry date was most important to them (79.2%) and only sometimes practices on use or read the items or labelling on food label. However, majority of respondents only sometimes (36.1%) and rarely (32.8%) using food label during food purchasing. Generally, females have higher KAP level than males. Knowledge level was associated to food label use (p=0.006). As a result, nutrition information is important to the consumers in order to have better health status. For university students in UTAR Kampar campus, they were sometimes or rarely use food label although majority of them was high nutrition knowledge level. Thus, future study is needed to investigate the factor affecting the food label use.

A44 Knowledge, attitude, & practice (KAP) on iron deficiency anemia (IDA) and its associations on the hemoglobin concentration among female students in Universiti Putra Malaysia (UPM)

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Insufficient iron-containing foods consumption is one of the main causes of iron deficiency, which later resulted in anemia. However, poor KAP towards IDA has also been demonstrated to contribute to the IDA development. Thus, a cross-sectional study aimed to determine the KAP on IDA and its association with hemoglobin (Hb) concentration was carried out among 171 female students with mean age±SD of 22.18±1.37 years. A self-administered socio-demographic and FAO KAP questionnaires were used to assess participant's personal background and KAP levels. Height and weight were measured to obtain body mass index, whilst Hb concentration was assessed using HemoCue Hb 201+ Analyzer with WHO cut-off of <12.0 g/dL considered as anemia. The KAP levels were classified by scores (poor: <50.0%; satisfactory: 50.0-65.0%; good: >65.0%), attitude (negative: <60.0%; positive: ≥60.0%) and practice (poor: <50.0%; good: ≥50.0%). Pearson correlation test was used to determine the associations between intended variables (p<0.05). The prevalence of anemia was 38.6 % with mean±SD Hb concentration of 12.13±1.53 g/dL. Majority of the participants had good knowledge level (43.3%) (mean±SD: 56.99 ± 17.20%), negative attitude level (76.0%) (mean±SD: 46.15±23.21) and poor practice level (59.1%) (mean±SD: 46.53±21.6%). The study found no significant association between knowledge (r=-0.101, p=0.187), attitude (r=-0.104, p=0.174), and practice (r=-0.109, p=0.156) with Hb concentration. However, significant association was observed between knowledge and attitude (r=0.295, p=0.000) suggesting increase in knowledge led to improvement in attitude. This study did not observe significant increase in KAP levels leading to improvement in Hb concentration as hypothesized, which may only influence iron-rich food consumption, but not to the extent to improve iron status in general.

A45 Dietary patterns and weight status of aboriginal primary school children in Negeri Sembilan

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Weight status is an effective indicator of identifying malnutrition among children. Rural areas had a higher prevalence of severely underweight and moderately underweight children than urban areas. Using dietary pattern approach, which considers a more comprehensive overview of the diet could provide more interpretable findings than studying single nutrients or foods since foods are not consumed separately. Main objective is to study the association between dietary patterns and weight status of aboriginal children in Negeri Sembilan. An Analytical Cross-Sectional Study was conducted in 3 aboriginal primary schools in Negeri Sembilan with 296 respondents. Semi-quantitative food frequency questionnaire was used to assess their food consumption. AnthroPlus software was used to calculate BAZ and all the data was analysed using IBM SPSS statistic software. Two dietary patterns were identified namely staple food pattern (eigen value=9.08, variance=11.22%) and high dense food pattern (eigen value=2.54, variance=9.72%). The prevalence of overweight was 17.7% and obesity was 16.7% among aborigine primary school children. Children with high household income significantly had higher BAZ compared to lower household income (F=3.457, p=0.018). Children aged 10-12 years old show a significant higher adherence to staple food pattern (t=-3.20, p=0.002) as well as for high dense food pattern (t=-3.71, p<0.01) compared to children aged 7-9 years old. Adherence to staple food pattern was high among children with parents with tertiary education background (F=4.801, p=0.01). High adherence for high dense food pattern was significantly higher among household with >5 members compared to household ≤5 members (Q4=64.5% vs 35.5%; X^2=8.171; p=0.043). There is no significant relationship between dietary pattern and BAZ. Sociodemographic background play crucial role in determining both dietary pattern and weight status.

Group B: Dietary Intake, Consumption Pattern & Disease

B01 Development of a semi quantitative food frequency questionnaire for adolescents and adults using a population-based sample in Malaysia

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Food frequency questionnaire (FFQ) is the most often used dietary instrument and recommended tool for assessing dietary information and long-term eating habits in epidemiological research. The revision of FFQ is required in order to cater the current/ up-to-date food consumed by targeted population. The aim of this study is to create a semi-quantitative food frequency questionnaire (FFQ) for adolescents and adults in a Malaysian population using data-driven approach. It was a cross-sectional study using a sample of 4,363 respondents aged 10 to 59 years from the Adolescent Nutrition Survey 2017 and Malaysian Adult Nutrition Survey 2014. Data from a single 24-hour dietary recall

containing 55,000 food items were selected. The food items were divided into 15 major food groups and then standardised into a 194-food list. Standardisation and categorisation of food/recipes name for creation of food list is based on conceptual similarities, main ingredients and nutrient profiles. Indicators such as total calories, carbohydrate, protein, fat, sodium, calcium, iron, vitamin A, vitamin C and thiamine were estimated using Block equation. A food list is formed from food items that contribute up to 90% of the nutrient of interest. Separate food lists were prepared for each of Malaysia's five major ethnic groups, Malay, Chinese, Indian, Bumi Sabah, and Bumi Sarawak and then integrated to ensure that the final FFQ adequately represents the food consumed by Malaysia major ethnic groups. Newly-developed FFQ which consists of 137 food items captured 90% of total population intake for all nutrient of interest. Using nationally representative 24-hour dietary recall data, this study ascertained the proportion of person consuming each food, both overall and by ethnic group, which foods were main contributors to absolute intakes of nutrients of interest, and which foods were commonly consumed by each ethnicity. This method may be valuable in developing similar dietary assessment instruments in other multi-ethnic settings.

B02 Knowledge, attitude and practice towards plant-based diet among public university students in Selangor

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Consuming adequate amount of plant-based foods daily helps in maintaining one's health and wellbeing. However, 94.9% of Malaysian adults did not consume enough fruits and vegetable as recommended by Ministry of Health Malaysia. This study aims to measure the level of knowledge, attitude and practice towards plant-based diet among public university students in Selangor, to examine the relationship of knowledge, attitude and practice towards plant-based diet, and to identify the influence of different aspects of attitude on practice towards plant-based diet. A total of 274 students identified through convenience sampling with a mean age of 22.49±1.786 years old from four public universities in Selangor (UPM, UKM, UIA & UiTM) completed the online-based self-administered questionnaire that contains validated socio-demographic and KAP items. University students from these four public universities have moderate knowledge (55.71±11.96%), moderate attitude (66.06±15.71%) but poor practice (32.36±15.60%) scores towards plant-based diet. The knowledge level of university students showed a significant positive correlation with attitude score towards plant-based diet (r=0.223, p<0.01); however, negative correlation were observed between knowledge with practice (r=-0.172, p<0.01) and attitude with practice (r= -0.272, p<0.01). From this study, it is shown that health, environment and social perception attribute does not contribute significantly to practice towards plant-based diet due to the negative and weak relationship between attitude and practice observed. In conclusion, public health authorities and universities should increase the availability of plant-based diet options while raising awareness on the benefits of consuming a healthful diet to promote an increase in dietary fibre consumption among university students in Malaysia.

B03 Analysis of aflatoxin M1 in urine with the association of dietary intake among breastfeeding mothers in Kuala Lumpur, Malaysia

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Aflatoxin is a toxigenic and carcinogenic fungus that is ubiquitous in nature. The main route of aflatoxin exposure in human is via ingestion of AFB1 contaminated food. Consumption of aflatoxin contaminated food is converted into AFM1 metabolite that is excreted in breast milk and urine of breastfeeding mothers. This study was conducted to assess the level of AFM1 in urine of breastfeeding mother with the association of dietary intake among breastfeeding mothers in Kuala Lumpur. A total of 256 mother's urine was collected and analysed using ELISA. Mother's dietary intake was assessed using food frequency questionnaire which consists of list of food that is susceptible to aflatoxin contamination. AFM1 was detected in 68% of the samples, ranging from the LOD of 0.00188 to 0.212 ng/ml. The mean concentration is 0.08±0.04 ng/ml. The highest food group consumed by the mothers was cereal based products with an average intake of 421.00 g/day. Maternal consumption of Legumes & nuts (χ^2=5.81, p=0.02) and dairy products (χ^2=7.18, p=0.007) are significantly associated with AFM1 in breastfeeding mothers. The data on aflatoxin exposure among breastfeeding mothers in Malaysia is inadequate. The present data may serves as a baseline data for future assessment and monitoring of aflatoxin exposure among mothers and infants.

B04 Reasons for vitamin mineral supplement intake among secondary school adolescents and its association with nutrition status and dietary practice

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Prevalence rates of vitamin mineral supplement (VMS) usage among adolescents and the general population are observed to be increasing recently. The objective of this study was to determine the association of dietary practice and nutrition status among adolescents and the reasons for vitamin mineral supplement intake. This was a cross sectional, national health survey conducted from March to May 2017 involving 40,097 school-going adolescents aged 10 to 18 years old. The representatives in this study were 9077 secondary school adolescents aged 13 to 17 years old who were reported to consume VMS. The results showed that the main predictors for VMS consumption were due to parents' advice (43.6%) and followed by self-awareness (31.7%), doctor's prescription (15.6%), other unspecified reasons (6.8%), and friend influences (2.3%). Using multinomial regression analysis, the expected risks of taking VMS due to doctors, parents, self-awareness, and friends versus other unspecified reasons were higher among male adolescents who sometimes experienced hunger, and had stunted growth. The expected risks of taking VMS were found lower among Chinese, those who did not take breakfast, and those who eat out daily. Understanding factors associate with the reason for VMS intake could determine the essential actions for nutrition education on VMS usage, thus promoting healthier dietary habit.

B05 Association between social media usage, body dissatisfaction and stress level with eating behaviour among public university students in Melaka

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Diet-related disease like obesity and diabetes are still on the rise in Malaysia, which Malaysia has become the second highest country of obesity prevalence in Southeast Asia and the sixth in the Asia Pacific region. It is critical to address diet-related disease in order to reduce the mortality rates associated with this issue, and learn more about eating behavior may increase the likelihood of success in combating the disease. This current cross-sectional study aims to determine the association between social media usage, body dissatisfaction, and stress level with eating behavior among students in Melaka. This study included 86 students from Universiti Teknikal Malaysia Melaka, with 45.3% male and 54.7% female students, and the majority (86.0%) aged between 18 and 24. Participants were asked to complete several self-report questionnaires, which included social media usage, body shape questionnaire, perceived stress scale and eating behavior questionnaire. The results showed that the most common eating behavior is uncontrolled eating (86.0%) whereas cognitive restraint and emotional eating, both are 7.0% for each category. The results also showed that there is no significant association between social media usage and stress level with eating behavior. However, there is a significant association (p=0.046) between body dissatisfaction and eating behavior, with the result indicating that the higher the level of body dissatisfaction, the lower the possibility of having uncontrolled eating, as respondents with no concern about body dissatisfaction have the highest percentage (41.9%) and respondents with marked concern have the lowest percentage (12.2%). In conclusion, despite the lack of a significant relationship between social media usage and eating behavior, further research on these variables is needed, as they may be influenced by a variety of other factors. Moreover, understanding more about the factors that influence eating behavior could help to reduce the global burden of diet-related disease.

B06 Frequency of home cooking is associated with higher diet diversity score among Malaysian adults during pandemic

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COVID-19 pandemic has impacted numerous areas of people's life and activities, compelling Malaysians to stay at home to curb the spread of virus. This has resulted in restricting eating outs and increase in preparing meals at home. On the other hand, prevalence of overweight and obesity are public health concerns in Malaysia. The impact of staying at home may also have adverse outcomes on body weight status and dietary intake. This study was aimed to determine the frequency of home cooking, body weight status, and diet diversity among Malaysian adults during the pandemic. One hundred healthy Malaysian adults aged between 18 to 59 years old were recruited online. Information on sociodemographic data, anthropometry measurements, dietary intake questionnaire, and two days 24-hour dietary recall were obtained from the subjects, and the diet diversity score was determined. Malaysian adults who cook at home every day increased from 19.0% to 41.0% during the pandemic. There was no significant difference between pre and post

pandemic body weight. Majority (65.0%) of the subjects had a diet diversity score (DDS) between 9 and 13. Frequency of home cooking was not associated with body weight status (p=0.951). Higher education level was associated with higher frequency of home cooking (p=0.022). Gender, ethnicity, age group, and marital status were associated with body mass index (BMI) (p=<0.001, 0.005, 0.003, <0.001). Frequency of home cooking was associated with higher diet diversity score (DDS) (p=0.034). It can be concluded that the frequency of home cooking had no impact on body weight status but influenced the diet diversity during the pandemic. Further studies are needed to validate the results.

B07 Knowledge on infant complementary feeding and its associated factors among students in health campus Universiti Sains Malaysia

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Exploring knowledge on infant feeding practices among undergraduate students is important for future enhancement among these population as infant feeding practices in Malaysia are still below par and need to be improved. The objective of this study is to determine the knowledge on infant complementary feeding and its associated factors among students in Health Campus Universiti Sains Malaysia (USM), Kelantan. A cross-sectional study was conducted from October 2020 to July 2021 among 231 purposively selected undergraduate students of USM Health Campus. A validated questionnaire was used, comprising of sociodemographic, source of information and education characteristic, and knowledge on complementary feeding. Complementary feeding is defined as the process starting when breast milk alone is no longer sufficient to meet the nutritional requirements of infants, and therefore other foods and liquids are needed, with breast milk. Descriptive analysis, Mann-Whitney test, Chi-square test and Fisher's Exact test were analysed. For the results of study, there were 82.7% female and 17.3% male respondents. Only 11.7% of them had good knowledge. Around 39.0% of them had received information on complementary feeding before. Age was significantly associated with level of knowledge on infant complementary feeding (p<0.001). There were also associations between education characteristics such as school, course, and year of study, with level of knowledge on infant complementary feeding (p=0.045, p=0.002 and p<0.001, respectively). Ever receiving information was also found to be associated with level of knowledge on infant complementary feeding (p=0.001). In conclusion, most of the undergraduate students in USM lacked of knowledge on infant complementary feeding. Curricular changes and health promotion on complementary feeding should be recommended.

B08 Dietary patterns of Malaysian adults: Energy, nutrient intakes and environmental impact

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Interest in restrictive diets (vegan, vegetarian, pescatarian, ketogenic and paleolithic diets) has risen over the years owing to their lower environmental damage and health-promoting effects. Due to the exclusion of certain foods, alongside the effect of socioeconomic status (SES), consumers often question the nutrient sufficiency of these diets. The objective of this

study was to investigate the association between restrictive diets, socioeconomic factors, and their impact on the adherent's nutrient adequacy and the environment. 109 healthy West Malaysian adults aged between 18-50, were recruited as participants. All dietary, anthropometric, and demographic information were collected through online one-to-one conferencing, using 24h recall diet diary, structured questionnaires, and food frequency questionnaires (FFQ). The Malaysian Recommended Nutrient Intakes (RNI) were used as a baseline to determine the nutrition adequacy of individual diets. Results have shown that the nutrient intakes in restrictive diets were not significantly lower than that in the omnivorous diet, greater intakes were found in the ketogenic diet. Nevertheless, vegetarians and pescatarians had lower compliance to energy, protein, and phosphorus recommendations. Across various SES indicators (gender, age, ethnicity, and employment status), differences in the achievement of RNI for energy, fat, potassium, iron, and thiamine were seen. While no significant difference in Greenhouse Gas Emissions (GHGEs) ($kgCO_2e/1000kcal/d$) was observed between the diets (p=0.413), the pescatarian diet showed significantly higher Cumulative Energy Demand (CED) (MJ/1000kcal/d) (CED=204.237±143.95; p=0.029). On a macronutrient level, fibre intakes had the weakest correlation with both GHG (r=0.172; p=0.074) and CED (r=0.266; p=0.005). Essentially, nutritional deficiencies can be prevented, regardless of the nature of the diet and the SES of the individual, through proper nutrition education and diet planning. As this is the first to investigate diet-related environmental impacts in Malaysia, future studies are warranted to further explore the relationship between the nutrient adequacy and environmental impact of different diets.

B09 Dietary intake status amongst Selangor State Football players during regular training

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Nutrition is an important aspect in sports, that documented to be a strong determinant in predicting achievements and sport performance amongst athletes. Intake of adequate nutritious food is also crucial to support the recovery process following training regime. Nevertheless, the dietary intake and nutrition adequacy of Malaysian football players is not documented extensively. A cross sectional study was conducted among state level footballers age between 18 to 21 years old to determine their dietary intake and nutrition adequacy. A total of 52 male footballers from Selangor Football Association (FAS) were recruited for this study. A 3-days 24-hours dietary records was administered as a tool for dietary assessment. The nutrient analysis was performed using NutriPro software to estimate the total intake of energy, macronutrients, and micronutrients. The athletes, despite their higher energy expenditure had a lower energy intake (2054± 741 kcal), a lower carbohydrate (245 ± 74g), protein (81 ± 28g) and fat (78 ± 41g) intake than the Recommended Nutrient Intake (RNI, 2017) that been established for Malaysian adults. Similarly, the athletes met only 50% or even less than 50% of RNI for some of the micronutrients such as Vitamin C (39.79 ± 74.40 mg), Vitamin E (3.64 ± 3.08 mg), Folate (56.08 ± 65.76 mg), Niacin (8.71 ± 5.71 mg), Calcium (475.08 ± 296.30 mg), Zinc (4.04 ± 2.94 mg), and Magnesium (73.73 ± 60.14 mg). The dietary intake of macro and micro-nutrients of the Selangor state footballers was lower than the daily nutrient recommendations. Insufficient nutrient intakes may compromise on the performance and recovery of football players. Regular nutrition education is recommended to improve the quality of diet intake by having a good balance diet to enhance the sporting performance.

B10 Factors associated with diet quality during COVID-19 pandemic among undergraduate students in Universiti Putra Malaysia

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Due to the outbreak of the COVID-19 pandemic, preventive and restriction measures were taken to hinder the virus transmission could disrupt the individual's daily diet quality that may lead to obesity and other non-communicable diseases (NCDs). Hence, this study aims to determine factors associated with diet quality during pandemic among undergraduates' students in Universiti Putra Malaysia, Serdang. An online cross-sectional study has been conducted among 130 undergraduate students who met the study's criteria. There were six sections of the self-administered questionnaire; sociodemographic characteristics, body weight status, nutrition knowledge, physical activity level, mental health status, and diet quality. For statistical analysis, Pearson's correlation test, Spearman correlations, Chi-square test, and Fischer's Exact test were conducted using SPSS version 26. The significant value was denoted if $p<0.05$. The majority of the respondents were female (76.2%), aged between 20-22 years old (64.6%), Bumiputera (80.0%), funded either by loan or scholarship (73.1%), low socioeconomic status (60.0%), residing in the family household during the MCO (57.7%), consumed home-cooked meals (58.5%), and the mode of frequency of using the e-hailing food services was 0-3 days/week (63.1%). Almost an equal distribution was reported in the year and program of study in every selected faculty. The majority of the respondents also reported were having normal weight status (54.6%), good nutrition knowledge (66.9%), practice sedentary lifestyles (48.5%), and the overall mental health status were less severe (85.4%). Most of the respondents reported having high diet quality (62.3%). Nonetheless, throughout this study, only the anxiety subscale was reported to have a negative association with diet quality with a weak correlation ($r= -0.20$, $p<0.05$). In conclusion, future studies could focus on the food environment and food security faced by the students as these factors could vary among each individual. It is also recommended to do diet quality differences between before, during, or after the pandemic.

B11 The school food environment: Are students making the healthy choice or the easy choice?

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Studies showed, Malaysian adolescents are more susceptible to follow unhealthy dietary practice, with a high prevalence of having a low quality of diet particularly a high-energy dense and low nutrient-dense food items. However, with the Management Guide for Healthy School Canteen of Malaysia, it is expected that these school going adolescents improve their dietary practices particularly in the school food environment. The current study aims to determine the relationship between the public secondary school students' perception towards their school food environment and their dietary practice involving 300 students from Form 1, 2 and 4 from all over the states in Malaysia. Data was collected using a validated and pretested questionnaire using online platforms. All the data was analysed using SPSS 23. Most of the students who are aware of the Healthy School Canteen guideline implementation in their school canteen (92.9%), and (53.6%) find that the food choice

at school canteen is healthier. Majority find the price and quality of food is acceptable (77.3%), however some (38.1%) feel healthy food are more expensive than unhealthy food. Only (17.9%) reported that students able to involve in school canteen organization and majority expressed their opinion that student's involvement is important (76.2%) and they are interested to join (52.4%). A higher proportion of students prefer to bring food from home as they feel lack of healthy and fresh food at school canteen (61.9%). In overall, majority have a moderate to poor practice of healthy diet in school (84.5%). There was a significant, positive, and moderate relationship between students' perception and practice on healthy diet in school environment (r=0.587, p<0.001). Students' autonomy in the development of healthy school food environment is important to enhance their perception and hence able to improve their dietary practice in school canteen to a much healthier choice.

B12 Assessment of knowledge, attitude, and practices towards Indonesian traditional fermented foods among young adults in Jakarta

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Indonesia has a rich variety of indigenous traditional fermented foods that are spread throughout all regions of the country. However, the strikes of fast foods and the rapid flow of globalization could potentially lead to the degradation of interest towards Indonesian traditional fermented foods (ITFF), especially for the young adults. To develop well-tailored approaches for the need of conserving Indonesian traditional fermented foods (ITFF), there is a need of an assessment that evaluates the knowledge and behavior level of young adults. This study aimed to determine level and association of knowledge, attitude, and practices (KAP) of young adults specific to the types and benefits of ITFF. A self-administered questionnaire was used to assess knowledge, attitude, and practices (KAP) of young adults. Chi-square test of independence and Spearman's rank order correlation were used as the statistical analysis. Majority of young adults in this study had poor KAP towards ITFF, and differences in socio-demographic background did not affect KAP levels. Attitude was found to be correlated with practices. Social media and family were the top chosen media for young adults to learn about ITFF along with other media. These findings are suggested to be used in building the future approaches. In conclusion, knowledge, attitude, and practices of young adults toward ITFF should be improved. Learning materials regarding ITFF could be emphasized through social media and family. Future studies involving ITFF with regards to different aspects and perspective could be done to boost the conservation of ITFF as the culinary heritage of Indonesia.

B13 Comparison of feeding practices, eating behaviors and dietary intake between children with Autism Spectrum Disorder of different body weight status in Sarawak

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Individuals with Autism Spectrum Disorder (ASD) are a nutritionally vulnerable population. To date, information on nutritional status and dietary intake of Malaysian children with ASD is scarce. This cross-sectional study aimed to compare parental feeding practices, child eating behaviors, and dietary intake between children with ASD of different body weight status from 16 autism intervention centers in Sarawak. A total of 124 children (83.9% males and 16.1% females) aged 2 to 11 years and their mothers were recruited using convenience sampling. Mothers were interviewed to obtain information on parental feeding practices and child eating behaviors. Anthropometric measurements including weight and height were measured by the researcher. Dietary intake was assessed using food diary and nutrient intakes were compared with the Malaysian Recommended Nutrient Intakes (RNI). The prevalence of at risk of overweight (4.8%), overweight (16.9%), and obesity (20.2%) was higher than that of thinness (3.2%). Inadequate intake of energy (33.9%), calcium (90.3%), vitamin C (37.9%), vitamin A (52.4%), and vitamin D (93.5%) was reported among children with ASD. Mothers with overweight/obese children reported higher scores in perceived child weight (p<0.001), concern about child weight (p=0.003), food responsiveness (p=0.001), emotional over-eating (p=0.035), and enjoyment of food (p=0.038) subscales as compared to their counterparts with normal weight. Overweight/obese children with ASD consumed more energy, fat, and iron than normal weight children with ASD (p<0.05). Children with ASD in this study were prone to overnutrition and nutritional deficiencies. Dietary interventions and trainings on parental feeding practices should be included in the intervention programmes by the autism intervention centers to improve feeding practices, eating behaviors, and nutrient intakes of children with ASD.

B14 Food intake, dietary practices, and type 2 diabetes risk during COVID-19 lockdown in Malaysian parous women: An online survey

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Dietary intake during the COVID-19 lockdown may be suboptimal, leading to metabolic disorders including type 2 diabetes (T2D). Parity is a risk factor for T2D development in women, possibly induced by metabolic alterations during pregnancy. Thus, this study aimed to determine food intake, dietary practices, and T2D risk during COVID-19 lockdown in Malaysian parous women. This cross-sectional online survey involved 69 subjects (mean age: 38.5±8.3 years; BMI 25.4±5.1 kg/m^2). The survey was conducted during a nationwide lockdown from March until May 2021. Data on sociodemographic factors, obstetric history, and anthropometric measurements were collected using Google Forms. Singapore Diet Screener assessed dietary intake and practices, whereas the Finnish Diabetes Risk Score (FINDRISC) tool assessed T2D risk. More than half the subjects (66.7%; n=46) were at risk of T2D. About 55.1% had a family history of diabetes, and 37.7% had a history of gestational diabetes mellitus. Moreover, nearly half (43.5%) were currently overweight or obese, and 20.3% exceeded waist circumference recommendations. About 43.5% did not perform physical activity, and 33.3% did not consume fruits and vegetables daily. Fruit and vegetable intakes were inadequate based on recommendations (0.8 and 1.4 serving/day, respectively). Carbohydrate intake was excessive at 66.5% from total energy intake, whereas fiber intake was inadequate (5.1 g/day). The frequencies of ordering from fast-food and other restaurants at least once per month were 81.2% and 82.6%, respectively. The majority of the subjects (89.9%) added sweeteners to tea, coffee, or malted beverages. More than half the subjects (59.4%) consumed dietary supplements. The study highlights

the need for nutritional education and support during the COVID-19 lockdown to improve dietary intake and practices among parous women to reduce their risk of T2D.

B15 Sugar intake among Malaysian adults from consumption of commercially packed ready to drink (CPRD) beverages daily: A tabulation by socio-demographic characteristics

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Commercially packed ready to drink carbonated and non-carbonated drinks are categorised as CPRD beverages in this study. CPRD beverages usually contain a high amount of sugar and their frequent consumption is linked to obesity, type 2 diabetes mellitus and cardiovascular risks among adults. This study aimed to determine sugar intake among Malaysian adults from daily consumption of CPRD beverages. Data for 305 respondents in this study were drawn from National Health and Morbidity Survey (NHMS) 2019, a nationwide cross-sectional study conducted among adults ≥18 years old in Malaysia. Respondents were recruited using stratified cluster sampling, covering urban and rural areas from all states in Malaysia. The data collection period was from July until October 2019. Information on socio-demographics and CPRD beverages intake of the respondents were collected by interviewer-administered questionnaires. BMI was calculated by weight (kg) divided by the square of height (m^2) and categorised according to WHO 1998 guideline. Descriptive analysis and Kruskal-Wallis H Test were used to analyse the data in SPSS Version 21. Statistical significance was set at $p<0.05$. The median sugar intake among adults consuming CPRD beverages daily was 25.4 grams/day (IQR: 20.7, 42.8). Of the total respondents in this study, 56.1% of them were males, of Malay ethnicity (68.5%), between the ages of 18-30 years old (46.9%), from urban areas (62.3%) and with overweight/obese BMI (47.9%). Male adults had significantly higher median sugar intake from CPRD beverages compared to the females ($p=0.001$). Malaysian adults who drank CPRD beverages daily were consuming approximately five teaspoons of sugar from these drinks alone. Among the socio-demographic characteristics, there was significant difference in sugar intake only between the gender.

B16 Knowledge, attitude and perception on climate change and its relation to climate-friendly dietary choices of university students in the Klang Valley

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Food system is responsible for approximately 26% of global greenhouse gas emissions. Thus, sustainable consumption pattern has been proposed to mitigate climate change. Knowledge is the key to address climate change as it affects the attitude and perception towards climate change, and influences behavioural intention to the consumption of climate-friendly foods. This study aimed to investigate the association between knowledge, attitude, perception of climate change and health impacts with climate-friendly dietary choices of university students in the Klang Valley. A total of 306 Malaysian university students aged 18 to 30 years in the Klang Valley, Malaysia participated in this cross-sectional study. A web-based questionnaire was used to assess knowledge, attitude and perception on climate change, and climate-friendly dietary choices. More than half of the respondents had good knowledge on physical (60.5%), causes (66.7%), expected consequences (68.3%), action-related (70.9%), health impacts (51.3%) and food choices (58.5%). A majority of

respondents had a good attitude towards climate change (63.1%), health impacts (50.0%) and food choices (53.3%). Most respondents had low-risk perception of climate change (55.6%), health impacts (52.0%) and food choices (59.8%). Attitude towards food choices (z=-2.597; p=0.009) and perception of climate change (z=-2.489; p=0.013) associated significantly with climate-friendly dietary choices. In the multiple linear regression analysis, knowledge about health impacts (β=0.848; p=0.002), attitudes towards food choice (β=-0.583; p=0.030), and perception of climate change (β=-0.783; p=0.003) significantly contributed to climate-friendly dietary choices (R=0.284; F=2.877; p<0.05), contributing 8.0% of the variances in climate-friendly dietary choices. Findings from the present study can be used to encourage the adoption of healthy and sustainable food consumption to reduce greenhouse gas emissions.

B17 Factors associated with sugar-sweetened beverage consumption among undergraduate health sciences students of Univerisiti Sains Malaysia Kubang Kerian, Kelantan

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This study aimed to determine the association of personal and environmental factors (demographic status, frequency of eating out, fast food intake, physical activity, and frequency of snack/supper intake, emotional and social motivation) and SSB consumption among undergraduate health sciences students of Universiti Sains Malaysia Kubang Kerian, Kelantan. A total of 183 undergraduate health sciences students of USMKK were included in this cross-sectional study. Each participant was given a questionnaire consisting of socio-demographic profile, SSB intake and lifestyle status. The results revealed that the majority of the participants' parents had an education level up to secondary school. Most of the participants were living in a family from group B40 with household income of less than RM 5000 (66.7%). Most of the respondents had a normal BMI (71.6%), followed by underweight and overweight (12.6% respectively) and obese (3.3%). The prevalence of at least one SSB in a week and at least once daily SSB intake was 89.6% and 21.3% respectively. Sweetened tea had the highest frequency of daily consumption (7.7%), followed by sweetened coffee and sweetened malted or chocolate drink (6.6%). Besides, most of the respondents had a low physical activity level (41%). The frequency of eating out, fast food intake and snacking of the majority of the students were one to three days per week with 61.2%, 53.6%, 60.7% respectively. The factors that showed significant associations with SSB consumption were gender (χ^2=6.477, p<0.05), family income (χ^2=11.640, p<0.05), frequency of snack and/or supper consumption (χ^2=10.300, p<0.05) and to keep awake and alert (χ^2=4.850, p<0.05). In conclusion, the study found that although most of the students did not consume SSB on a daily basis but consumed SSB several times a week. Innovative health promotion interventions need to be implemented to achieve a healthy lifestyle and reduce SSB consumption.

B18 Assessment of food environments around public schools in Penang using a Geospatial Quantitative Analysis approach

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Food environment around schools is important to influence dietary eating choices that could be significantly associated with the general health and nutritional well-being of children. The aim of the present study was to assess the types of food outlets commonly available, and its density and proximity distribution of these food outlets surrounded the public schools in Penang using a geospatial quantitative analysis approach. The main results showed that a total of 43,339 food outlets comprised 14 main food outlet types were identified within the 1000 metres buffer zones of public schools, in which restaurants (38.9%) were the highest food outlets, followed by food stalls (18.5%), cafés (9.8%) and food courts (7.2%). Multivariate analysis was used to assess the distribution of food outlet types based on the districts of Penang after adjusting for school types, geographical status of schools, and total student size, it showed that the Northeast of Penang Island had the highest food outlets within 1000m buffer zones in these public schools, especially for restaurants (p<0.001), food stalls (p<0.001), cafés (p<0.001), and food courts (p<0.001) compared to other districts. When further analysis of food outlet types between primary and secondary schools was compared, it showed that there were no differences of all food outlet types assessed between primary and secondary schools, except for night market (p<0.05). In general, most common food outlets available and located in the buffer zones of 1000m were restaurants, food stalls, cafés, and food courts in Penang. The quality of food sold in these outlets might influence the child's dietary choice and eating pattern. Hence, a more supportive healthy food environment to improve the nutritional quality of the foods available surrounded in public schools should be regarded as an important strategy to encourage and promote healthy eating food choices among growing children and adolescents during their school-age period.

B19 Determination of the most frequently available type of street food and factors affecting its selection among the adult consumers in Melaka

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Locals are attracted to the authenticity of street food sold in Melaka. However, street foods that are high in calories, sugar and salt may have the risk to contribute to the prevalence of non-communicable diseases among Malaysians. This study aimed to determine the most available type of street food and factors affecting the selection of street food among adult consumers in Melaka. In phase 1, a survey was conducted at several stalls and night markets using a survey form. A cross-sectional study was conducted in phase 2 using an online questionnaire that involved 139 Malaysian adults, aged 18 and above and had purchased street food in Melaka. The survey showed that the most frequent type of street food in main meals, snacks and dessert categories found were chicken burger (5.3%), grilled sate (7.9%) and ice cream (24.4%), respectively. The snack category has the highest frequency in the availability of street food. Consumers in Melaka preferred purchasing snacks at least once a week, taken during teatime and prefer street food such as nasi lemak, keropok lekor and ice cream. Hygiene (4.28±0.89) was the main factor that influenced the choice in purchasing the street food, followed by food attributes (3.76±0.95), price (3.73±1.03), practice and tradition (3.61±0.95), time (3.61±0.92), quantity (3.51±0.95), environment (3.37±0.94), calorie content (3.19±0.91), sugar content (2.83±1.02) and fat content (2.67±1.02). Fisher's Exact test showed a significant (p<0.05) relationship between educational level with attributes, price, and age with calorie factor. In conclusion, education on nutritious food and quality food campaigns need to be exposed to hawkers to encourage healthy food preparation while the consumers can make a good choice in terms of nutrition when purchasing street food.

B20 Association of parents' food choice motives and food preferences among children aged 2-12 years old in Selangor

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Parents have a huge influence in shaping their children food intake and food habit because they are the one that responsible in selecting foods for their children. This cross-sectional study aimed to determine the association between parents' food choice motives and food preferences among children aged 2-12 years old in Selangor. This study used a questionnaire that consists three parts including sociodemographic information, Food Choice Questionnaire (FCQ) and Food Preferences Questionnaire (FPQ). A total of 162 parents (mothers=63.6%, fathers=36.4%) were participated in this study. There was about 82.1% parents perceived their child's body weight status as normal weight, 6.8% parents perceived their child's body weight status as underweight and 9.9% parents perceived their child's body weight status as overweight. Majority of parents (79.8%) considered health (mean score=4.49±0.46) as their most important factor when choosing foods for their children. While, majority of children (61.7%) choose snacks (mean score=4.07±0.63) as their main food preferences compared to the other food types. There was no significant association between parents' food choice motives (ie. health) and children most preferred foods (ie. snacks) (r=0.050, p=0.527) but there were significant correlations between health and fruits (r=0.236, p=0.003), meat (r=0.196, p=0.013) and vegetables (r=0.354, p<0.001). As for the mood factor, there were significant correlations with starches (r=0.168, p=0.033), meat (r=0.185, p=0.018) and vegetables (r=0.214, p=0.006). The sensory appeal factor has a significant correlation with snacks (r=0.390, p=0.000) and natural content factor has a significant correlation with vegetables (r=0.300, p<0.001). The convenience factor has a significant correlation with snacks (r=0.304, p=0.000) and weight control factor has a significant correlation with vegetables (r=0.290, p<0.001). Meanwhile, familiarity factor has significant correlations with snacks (r=0.156, p=0.048), dairy products (r=0.156, p=0.048) and vegetables (r=0.190, p=0.015). The ethical concern factor has a significant correlation with meat (r=0.194, p=0.013) and lastly, the price factor has a negative significant correlation with dairy products (r=-0.173, p=0.027) and significant correlation with vegetables (r=0.178, p=0.023). Interventions targeted on the parents should considered to educate them about strategies to implement their health motivations towards their children's food intake.

B22 Factors associated with dietary quality among pregnant women in Selangor

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The objective of this study was to determine the dietary quality and its associated factors among pregnant women. A total of 84 pregnant women in third trimester living in Selangor were involved in this study. Respondents were approached through online platform specifically Facebook group consist of pregnant women. Knowledge, Attitude and Practice (KAP) questionnaire was used to measure nutrition knowledge whilst stress level was measured using Perceived Stress Scale (PSS), depression symptoms was measured using Edinburgh Depression Scale (EDS), social support was measured using Multidimensional

Scale of Perceived Social Support (MSPSS) and dietary quality was measured using Food Frequency Questionnaire and Malaysian Healthy Eating Index (MHEI). Pearson Product Moment Correlation analysis was used to understand the correlation between sociodemographic factors, nutrition knowledge and psychosocial factors with dietary quality among pregnant women. Majority of the respondents were Malay (89.2%) with the mean age of 28.19±5.27 years, obtained tertiary education (88.1%) and in B40 categories (63%). Majority of the respondents were having a moderate dietary quality (60.7%) and 23.8% of the respondents were having a low dietary quality. This study has found that there was a significant association found between stress level (p=0.031), overall perceived social support (p=0.009), social support from family (p=0.015), friends (p=0.012) and partner (p=0.009) with the dietary quality of pregnant mother. In conclusion, more than half of the respondents in this study were having a moderate and poor dietary quality. Furthermore, psychosocial factors including stress level and social support were found to be associated with dietary quality among pregnant women and it was suggested to consider these factors when planning and doing nutrition assessment and intervention for all healthcare professionals.

B23 Assessment of diet diversity according to socioeconomic background, nutrition knowledge and food security status among households who receive The Lost Food Project (TLFP) in low-cost public houses in Klang Valley

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Emergence of non-communicable diseases occurs due to transition of individual nutrition from traditional diets to high energy dense diet which mostly affects low-income which results in poor diet quality. There are several determinants that can be found to be linked with diet quality among individuals. It can be categorized into adequate diet diversity and not adequate diet diversity. Thus, cross-sectional study aimed to compare diet diversity between socioeconomic background, nutrition knowledge, food assistance and food security status among households who received TLFP food assistance. A total of 87 respondents aged between 17 to 69 years as a representative for each households who received TLFP food assistance were selected from two areas of public houses in Klang Valley. A self-administered questionnaire consists of socioeconomic background, nutrition knowledge, food assistance, food security status and diet diversity were completed. Diet diversity was assessed using Minimum Diet Diversity Scores (MDD-W). Nutrition knowledge was assessed using KAP questionnaire by TWR-G, food security status was assessed using U.S. Food Security Survey Module 2012: Six-item short while food assistance and socioeconomic background were accessed by using self-developed questionnaires. More than half of respondents (69.0%) were found to have more diverse diet and at moderate to good level of nutrition knowledge (65.5%) even though they were food insecure (58.6%). The level of satisfaction, usefulness and significance of TLFP food assistance were assessed among respondents which are 72.4%, 88.6% and 86.2% respectively. Diet diversity scores were found to be significantly difference between household monthly food and drinks expenditure (t=-2.573, p=0.016). However, diet diversity score was not significantly difference between other socioeconomic background, nutrition knowledge, food assistance and food security status (p>0.05). In conclusion, even though nutrition knowledge of respondents was at moderate to good level, there are several items should be looked out in future intervention study. Hence, several limitations and recommendations were pointed out to be improved by TLFP managements and future studies. For limitation, different data collection method results in bias, TLFP management does not record the list of recipients and recipients

unable to differentiate food assistance provided by TLFP with other agencies. It is advisable for TLFP management to have systematic management starts from having a recorded list of recipients and distribution of goods together include TLFP logo or flyer when distributes goods to recipients. Last but not least, future intervention study should focus on certain aspects of nutrition knowledge that had been pointed out in current study.

B24 Association of neighborhood food environment status and food purchasing behavior with dietary quality among urban, low-income adolescents living in Kuala Lumpur

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Disparity in the neighborhood food environment (NFE) and the trend of healthy food prices put urban poor adolescents at high risk of unhealthy diets and obesity. Thus this study aimed to investigate the relationship between NFE statuses and food beverages purchasing behavior with dietary quality among adolescents from family B40 (Below 40) in Kuala Lumpur. This cross-sectional study involves 184 adolescents from six public secondary schools in Kuala Lumpur. The online self-administered questionnaire through Google Form was used to obtain information regarding adolescents' sociodemographic factors, dietary quality (Adolescent Nutrition Survey FFQ), perceived availability, accessibility, affordability of NFE, and purchasing behavior. Using Geographic Information System (GIS), home addresses were mapped for food deserts/food swamps NFE status. Associations were examined using Pearson correlation and Chi-Square Test. Overall, adolescents' dietary quality is reported as 'requires improvement' (62.0%). The majority (60.3%) resided in healthy food environment and only minority live in food swamps (37.0%) and in food deserts (2.7%). While greater number of them perceived to have high food availability (76.6%) and affordability (64.7%), they perceived low accessibility (51.7%) to healthy food stores in their neighbourhood. Majority (33.2%) of them also perceived never used online food delivery (OFD) service prior a month. Age (r_s=-0.185), ethnicity (X^2= 5.745), fathers' educational level (r_s=0.150), non-fast-food restaurants (NFFR) (r=-0.161) and convenience stores (r_s=-0.197) were significantly correlated with adolescents' dietary quality (p<0.05). However, all food and beverage purchasing determinants are non-correlated (p>0.05). Thus, the dietary quality of urban poor adolescents in Kuala Lumpur is described as requiring improvement. Access to retailers should be enhanced and the number of NFFR and the availability of convenience stores in the neighbourhood may need to be monitored. Intervention programs should focus on older adolescents and ethnicity when planning initiatives to improve teenager's dietary quality.

B25 Breastfeeding information and personal sharing through Facebook: Content analysis pre- and during the COVID-19 pandemic

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The accuracy of online breastfeeding information is debatable despite the pandemic outbreak that has caused more people to seek information and support through social

media. Therefore, this study aimed to compare the content, forms/type and degree accuracy about breastfeeding that were posted on Facebook pre- and during the COVID-19 pandemic. A total of 456 data-posts were collected from Facebook pre- and during the COVID-19 pandemic phases (228 data-posts per phase). Keyword searches were conducted in Malaysian public and groups/pages on Facebook using Malay and English breastfeeding terminologies. All data were entered into a codebook, which was subsequently exported to SPSS for content analysis. The Delphi method was used to re-validate the accuracy of data-post content based on established policy/guidelines and additional experts review. Sharing personal experience (53.2%) accounted for the majority of breastfeeding-related post content, followed by seeking questions (39.3%) and knowledge (8.0%). During COVID-19, sharing personal stories data-posts were significantly more frequent than pre-COVID-19 (p=0.001), while the total data-posts of seeking questions were significantly higher in pre-COVID-19 phase (p=0.001). Text form was the highest (94.52%) type of breastfeeding information posted by users, followed by infographic (3.07%) and video (1.75%). The forms of breastfeeding information were not significantly different pre- and during COVID-19 (p>0.05). Almost half (46.5%) of data-posts were classified as misleading, while others were correct information (43.7%) and the remaining as mixed (9.9%). The degree accuracy of information between pre- and during the COVID-19 phase was significantly different (p=0.001), with more misleading data during pre- phase. Forms of information posts remained consistent; however, the content of breastfeeding information and its degree accuracy were different pre- and during the pandemic. Therefore, further aspects of online information should be evaluated, especially the degree accuracy of the information about breastfeeding information and maternal-infant care.

B26 Parental feeding practices and their association with parent's and child's characteristic in Selangor

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Children's eating behaviour is greatly influenced by their parents. Thus, this study aimed to assess the parental feeding practices (PFP) and their association with parents' and child's characteristics. A cross-sectional study was conducted among parents of children aged 2-12 years old in Selangor. The data was collected by using Google Form on parents' and child's socio-demographic details, PFP by using Comprehensive Feeding Practices Questionnaire, parents' perception on child's weight status and child's screen time per day. Data was analysed by using Pearson's correlation test. A total of 193 parents participated in the study (Mother=84.5%, Father=15.5%, Mean age=37.54±6.80 years). For parent's characteristics, among all 12 PFP, parent's age were significantly correlated with pressure (r=-0.317, p<0.01) and restriction for weight control (r=0.202, p<0.01). Parent's gender was significantly correlated with monitoring (r=0.198, p<0.01) encourage, balance and variety (r=0.285, p<0.01), involvement (r=0.024, p<0.01), modelling (r=0.155, p=0.032), restriction of health (r=0.173, p=0.016) and teaching about nutrition (r=0.168, p=0.020). Parent's educational level was significantly correlated with monitoring (r=0.191, p<0.01) and environment (r=0.201, p<0.01). Parent's perception on child's weight status was significantly correlated with monitoring (r=0.145, p=0.045), pressure (r=-0.158, p=0.028) and restriction for weight control (r=0.358, p<0.01). However, there was no significant correlation between parent's household monthly income and all PFP. For child's characteristic, child's age was significantly correlated with involvement (r=0.178, p=0.013), pressure (r=-0.292, p<0.01) and restriction for weight control (r=0.176, p=0.015). Child's gender was significantly correlated with involvement (r=0.147, p=0.041) and teaching about nutrition (r=0.142, p=0.049). Child's screen time per day was significantly correlated with child control (r=0.238, p<0.01). Overall, this study found that some characteristics of

parents and children were associated with the PFP. This study give additional insight on parental feeding practices among parents in Malaysia and might guide future intervention related to parent-child nutrition.

B27 Association between dietary omega-3 intake and haemoglobin concentration among female students in Universiti Putra Malaysia (UPM)

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Anaemia is due to several factors including nutritional deficiency of specific nutrients including iron and vitamin D. Association between unsaturated fat and iron absorption also has been reported, however it remains unclear whether similar trend of association can be observed with omega-3 polyunsaturated fatty acid (Omega-3PUFA). Therefore, this study was aimed to investigate the association between dietary omega-3 intake and Hb concentration, in a cross-sectional study carried out in 120 female students (mean±S.D age: 22.46±0.15 years). A set of questionnaires was used to determine socio-demographic characteristics and anthropometric measurements including height and weight were obtained. Dietary omega-3 intake was evaluated using a 42-item Omega-3 Polyunsaturated Fatty Acids Food Frequency Questionnaire (Omega-3PUFAFFQ). Hb concentration was assessed using Hemocue Hb 201+ Analyzer and concentration of <12.0 g/dl was considered as anaemia. Pearson and spearman correlation tests were used to determine the associations between intended variables as appropriate (p<0.05). The study observed mean±S.D Hb concentration was normal (12.00±1.48 g/dl) with anaemia prevalence of 47%. The mean±S.D dietary omega-3 intake was 0.86±0.65 g/day with nearly 50.8% achieved the RNI. No significant association was observed between the overall dietary omega-3 intake and Hb concentration (r=0.056, p=0.547), as well as the analyses in each food group (fish and seafood, plant-based oil, vegetables, meat, poultry and egg, milk and dairy product). Additional analyses carried out in anaemic participants (n=56) also observed no significant association between dietary omega-3 intake and Hb concentration (r=-0.081, p=0.553). Despite of the non-significant findings, due to the linear trend observed between improved Hb concentration with increased intake of omega-3 observed in this study, further investigations should evaluate the role of anti-inflammatory properties in Omega-3PUFA which have been demonstrated to contribute to the improvement of iron status in general.

B29 Dietary intake, empty nest syndrome and sarcopenia among older adults with low socioeconomic status in Kelantan

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Low socioeconomic status (SES) is one of the risk factors of poor muscle strength especially hand grip strength. This may lead to increasing prevalence of disability especially among lonely older adults. The objective of this study is to determine the association between dietary intake, empty nest syndrome and sarcopenia among older adults with low socio-economic status in Kelantan. This study involved 292 older adults aged 60 years and above, from the category of B40 and having low education level residing in Kelantan districts of Bachok, Machang, Pasir Mas, Tumpat and Kota Bahru. Sarcopenia was assessed using the Asian

Working Group of Sarcopenia (AWGS) guidelines which defined sarcopenia as having low muscle strength and low muscle mass but normal muscle performance. Muscle strength is determined using hand grip strength, muscle mass using skeletal muscle index and muscle performance using short physical performance battery (SPPB). Empty nest syndrome is determined using single question of 'Whom are you living with?' Habitual dietary intake of respondents was assessed using Dietary History Questionnaire and analysed using NutriPro software. Findings showed that 39.9% of participants were having sarcopenia and was higher in men (48.5%) as compared to women (32.5%) (p<0.006). Individuals with sarcopenia had significantly lower body mass index and waist circumference as compared to those without sarcopenia (p<0.05). About 30% of subjects were experiencing empty nest syndrome. Association between empty nest syndrome and sarcopenia was not significant. Descriptive dietary analysis showed that subjects did not meet the recommended nutrient intake for all the major macro- and micronutrients. No significant differences were observed between dietary intake and sarcopenia and empty nest syndrome status. Sarcopenia affects nutritional status of older adults. Dietary intake among older adults burdened with poverty is low despite sarcopenia status. Poverty contributes to malnutrition, sarcopenia, and poor dietary intake.

B30 Factors influencing food preferences among international students in Universiti Putra Malaysia

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Food preferences 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. While the number of international students has been increasing in Malaysia, understanding their food-related needs and emphasizing their issues becomes more significant. Therefore, this study aimed to determine the contribution of socio-demographic characteristics, psychological factors, food environment, general acculturation, food choice motives and general nutrition knowledge towards food preferences of international students in Universiti Putra Malaysia. In this cross-sectional study, 619 international have completed the entire 20-minute questionnaire. The questionnaire consisted of seven different sections including socio-demographic characteristics, psychological factors, food environment, general acculturation, food choice motives, general nutrition knowledge and food preferences. Food preferences were measured by a 77-item Food Preference Questionnaire (FPQ) by categorizing them into six food groups; 20 vegetable items,15 fruit items, 14 animal items, eight dairy items, eight snack items, 10 starch items. Pearson and Spearman Correlation, Kruskal-Wallis 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 Middle Eastern (37.2 %) and Asian (33.8 %) and the marital status of respondents were mostly single (67%). The majority of the respondents (68.4%) were lived with others. There were 38% of the respondents were PhD students followed by undergraduate students (33.6 %). The results showed that the major significant predictors were food availability (β=0.182, p<0.001) towards animal food preferences; price (β=0.179, p<0.001) for starch group food preferences; food accessibility (β=0.135, p=0.002) for dairy group; nutrition knowledge (β=0.257, p<0.001) for fruit group food preferences; food neophobia (β=0.132, p=0.001) for snack group food preferences; and ethical concern (β=0.265, p<0.001) for vegetable group food preferences. In conclusion, food availability and food accessibility, food choice motives and general nutrition knowledge emerged as prominent factors that influence food preferences of international students in Universiti Putra Malaysia. Moreover, during orientations, UPM Student Affairs Division could prepare explanatory maps that show where fresh food is found in and around the campus to improve the food environment (food accessibility) in UPM. Further

study is needed to understand how these factors influence other international students throughout Malaysia.

B31 Knowledge, attitude and practice (KAP) on salt intake and its relationship with blood pressure among Chinese adults in Johor

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Hypertension is one of the most serious health problem worldwide as well as in Malaysia with high salt intake as the major risk factor related to it. Therefore, this study was aimed to determine knowledge, attitude and practice (KAP) on salt intake and its relationship with blood pressure among Chinese adults in Johor. This cross-sectional study comprised of 90 subjects (36 males, 54 females), aged 18 to 59 years old. Subjects were required to answer the online questionnaire regarding KAP of salt intake. Self-reported anthropometry data and blood pressure measurement were recorded. Sodium intake was determined using a single 24-hour dietary recall method through face-to face or telephone interview. Results showed that majority subjects were within normal Body Mass Index (BMI) range and optimal blood pressure range. BMI was found to have significant correlation with systolic blood pressure (r=0.563, p<0.05) and diastolic blood pressure (r=0.444, p<0.05). Mean sodium intake of subjects was 2399 mg/day. Sodium intake was found to have significant correlation with systolic blood pressure (r=0.220, p<0.05). Results indicated that the overall KAP score was fair (64.14%). The knowledge of most subjects was fair (69.95%) besides having positive attitude towards salt intake (74.17%). However, practice of healthy salt intake among them was inadequate (49.53%). Sociodemographic characteristic of female gender was significantly associated (p<0.05) with better attitude. Additionally, older subjects, married subjects and subjects with higher level of education were significantly associated (p<0.05) with better practice towards healthy salt intake. In this study, there were no significant (p>0.05) associations between KAP on salt intake with sodium intake and blood pressure. In conclusion, BMI and sodium intake were significantly associated with blood pressure among Chinese adults. Further effort and interventions are needed to reduce the salt intake among Chinese adults and thus reduce the risk of hypertension.

B32 Eating behaviours among online learning undergraduates during Covid-19 pandemic

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Unhealthy eating behaviour such as meal skipping and snacking on energy dense foods are commonly practiced by the university students and it may contribute to health problems in the later stage of life. The objective of this online cross-sectional study is to examine the eating behaviours among online learning undergraduates during Covid-19 pandemic. There are total of 122 students (female 81.97% and male 18.03%) aged 21.61±0.931 years participated in this study. All the students were required to fill in the online Eating Behaviour Questionnaires (EBQ) which consists of sociodemographic, meal pattern, snacking behaviour, dietary practices, supplement intake and weight change program participation. Students were also needed to self- report their weight and height. Among the students 59.02% were

normal weight, 27.05% of them were underweight and 13.93% were overweight/obese. 52.46% of the students were practicing meal skipping and breakfast was the most skipped meals (46.72%). Besides that, most of the students snacked between meals (94.26%) and 12.30% of the students snacked during supper daily. Biscuit (88.52%), bread (84.43%) and fruits (80.33%) are the most popular foods consumed by the students. While milk (66.39%), tea (58.20%) and chocolate malted drink (49.18%) were the most frequent beverages that the students consumed. 27.05% had their meals at hawker centre 1-3 times per month and 45.08% had western food 1-3 times per month. Around 40.98% of them consumed supplement and only 4.10% joined weight change program. In conclusion, most of the students practiced meal skipping and snacking behaviour. Hence in the future, more health interventions program can be conducted to promote healthy eating behaviours among university students.

B33 Associations of socio-demographic and lifestyle factors with emotional eating among Malaysian adults during the COVID-19 pandemic

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The prevalence of the COVID-19 cases in Malaysia remains high and Malaysia is having various forms of lockdowns that may affect people's lifestyles, including their eating habits. One of the eating habits is emotional eating. Both negative and positive emotions can lead to emotional eating. This is an online cross-sectional study that aims to examine the associations of socio-demographic and lifestyle factors with emotional eating among Malaysian adults during the COVID-19 pandemic. A total of 309 respondents (25.9% males, 74.1% females) aged 18 to 59 years from all states in Malaysia participated in this study. All respondents were required to complete a set of self-administrated questionnaire on socio-demographic factors, weight and height, eating behaviours, food delivery habits, night eating habits, sleep quality, physical activity, stress, and emotional eating, via Google Form setting. Results showed that the prevalence of emotional eating among Malaysian adults was 54.0% (Male: 26.3%; Female: 73.7%), with a mean of 35.20±11.995. For socio-demographic factors, age, marital status, and occupation were significantly associated with emotional eating (r=-0.132, p=0.020; x^2 = 11.502, p=0.001; p=0.007). Supper consumption was significantly associated with emotional eating (p=0.007). Eating out behaviour was not associated with emotional eating, except for the frequency of eating outside or making delivery orders at hawker centers, coffee shops, or other food stalls during the COVID-19 pandemic (p=0.002). Besides, sleep quality (p=0.009), night eating syndrome (p=0.003), physical activity (p=0.004), and stress (r=0.305, p=0.001) were significantly associated with emotional eating. However, meal consumptions and BMI did not show significant associations with emotional eating during the COVID-19 pandemic. In conclusion, about half of the Malaysian adults were reported to have some forms of emotional eating during COVID-19 pandemic, whereby socio-demographic (age, marital status, occupation), and lifestyle (snacking during supper, frequency of eating outside or making food deliveries, sleep quality, night eating syndrome, physical activity, and stress) factors were associated with emotional eating. Further study is needed to confirm the main factors that contribute to emotional eating among Malaysian adults. Health care professionals may need to consider the emotional eating problem in future nutrition and health promotion programs.

B35 The serving styles of fruits and vegetables and its relationship with average fruits and vegetables intake among Indian children in Malaysia

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Consumption of fruits and vegetables are very important to reduce the prevalence of non-communicable diseases and metabolic syndrome among children in Malaysia. Serving styles of fruits and vegetables are attracting children to eat by changing their perception and feel of these foods. This study aimed to determine the relationship between daily average fruits and vegetables consumption and serving styles of fruits and vegetables preferred by children. A total of 102 parents of Indian children aged 10 to 11 years completed the *Google Form* questionnaire, distributed through social media such as *WhatsApp* and *Facebook* which consisted of daily average fruit and vegetable intake by children, serving styles of fruit and vegetables preferred by children through simple random sampling and snowball sampling methods. Majority of the Indian children in this study did not achieved the daily recommended servings of fruits (54%) and vegetables (81.4%) set by Malaysian Dietary Guidelines for Children and Adolescents 2013. A total of 82.4% Indian children preferred "Macedoine" serving style for fruits compared to (57.9%) for vegetables. More than 70% of Indian children preferred "Julienne" and "Shapes" serving styles for vegetables. There is a significant relationship between daily average fruit consumption and serving styles of *"Slices"* (p=0.032) and *"Macedoine"* (p=0.020) for fruits. There was no significant correlation (p>0.05) between daily average vegetable consumption and all types of vegetable serving styles. Majority of the Indian children did not achieve the daily recommended servings of fruit and vegetables set by Malaysian Dietary Guidelines for Children and Adolescents 2013. However, fruits consumption of Indian children were influenced by *"Slices"* and *"Macedoine"* serving styles for fruits. Parents need to be more creative in preparing fruits and vegetable dishes according to the taste preferred by the children by presenting various forms of serving styles which appeals to children. This will help children to eat more fruits in the future.

B36 Determination of the most frequently available type of street food and factors affecting its selection among the adult consumers in Negeri Sembilan

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Around 2.5 billion people worldwide consume street food every day due its being low cost, convenient and easily available. There are many factors which may influence the consumption of street food by consumers. This study aimed to determine types of street food mostly available in Negeri Sembilan and factors that affect the choice of street food by adult consumers in Negeri Sembilan. In phase 1, a survey was conducted at several stalls and night markets using a survey form. A cross-sectional study was conducted in

phase 2 using an online questionnaire that involved 139 consumers in Negeri sembilan. For phase 1, total street food data collected were 333 for main dish, 305 for snack and 164 for dessert. The top 15 food was chosen for each category from the data to identify which food was chosen the most by consumers in Negeri Sembilan. Category of street food which was frequency available for main dish, snack and dessert were *nasi lemak, keropok lekor* and *apam balik,* respectively. For phase 2, factors that affect the purchase of street food was identified by using the Likert 5-scale questions which included 10 factors. Factor like cleanliness (4.35±0.87) was the main factor affecting the choice when selecting the street food. The result also showed that 6 out of 10 factors such as attribute, price, quantity, practice and tradition, environment and calorie content were significantly (p<0.05) related to sociodemographic of the consumers. In conclusion, the street food study in Negeri Sembilan found that cleanliness was an important factor among consumers when choosing street food. Education and awareness in healthy nutrition need to be exposed to the vendors so that they are aware of healthy food preparation while the consumer can make good choice in terms of nutrition when buying the street food.

B37 The competitive food conundrum: Secondary school students' perception and purchase behaviour

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In 2010, the Management Guide for Healthy School Canteen of Malaysia categorized most of competitive food in school canteen as fast food, food not recommended, and food forbidden and proposed healthier options. However, students' perception and purchase behavior of the competitive food available in school environment is yet to be studied. This descriptive cross-sectional study aims to investigate the relationship between perception and purchase behaviours of competitive food among 250 secondary school students in Malaysia. Data was collected using a validated and pre-tested questionnaire. Only 17.0% of the student often check for the nutrition label of snacks or beverages sold outside the school and 42.9% reported that they only concern about the taste rather than the nutrition value of the food. Usage of vendor machines in the school compound was very rare among the school students (57.9%) but significantly higher among males compared to females (t=2.98, p=0.005). Among them, 42.9% believed that buying food from vending machines is more convenient that buying food at school canteen. Snacks such as sweet, often used as gift during class hours (72.6%). Food hampers also is a common gift given to the students for a competition (59.3%). In term of purchase behavior. Consumption of sweets during class hour was relatively high among secondary school student (44.0%) especially among males compared to females (t=3.292, p=0.002). Preference towards unhealthy competitive food showed a significant positive and moderate relationship with sweetened beverage consumption (r=0.500, p<0.001) as well as junk food consumption (r=0.516, p<0.001) outside the school compound. In overall, preference towards unhealthy competitive food showed a positive relationship with a poor purchase behavior among the school students (r=0.630, p<0.001). In conclusion, enforcement competitive food guideline may reduce access to unhealthy foods/beverages in secondary schools, but additional initiatives are needed to provide students with knowledge of healthy options.

B38 Factors associated with compliance towards iron supplementation among pregnant women in Selangor and Kuala Lumpur, Malaysia

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Non-compliance towards dietary iron supplementation is known to contribute to anaemia during pregnancy. However, majority of the local existing studies are limited to descriptive studies. Thus, this study aims to determine the factors associated with compliance towards dietary iron supplementation among Malaysian pregnant women. This study was part of the Mother and Infant Cohort Study (MICOS). A total of 475 third-trimester pregnant women aged 18 to 40 years were recruited from selected health clinics in Selangor and Kuala Lumpur. Information on compliance towards dietary iron supplementation, socio-demographic characteristics, knowledge-related characteristics and other characteristics (experiencing side effects of dietary iron supplementation, worrying of having a large size of baby, receiving social support) were obtained via face-to-face interviews. Information on obstetrical characteristics were obtained using secondary data from the antenatal medical records. Compliance is defined as taking dietary iron supplements for at least five days per week. This study found that one-in-five of the pregnant women were non-compliant towards dietary iron supplementation during pregnancy, with a meanstandard deviation of 5.531.69 days per week. Pregnant woman with higher education level (OR=2.797, 95% CI=1.526-5.125, p=0.001), spouse of older age (OR=1.078, 95% CI=1.016-1.144, p=0.013), who were being anaemic previously (OR=0.377, 95% CI=0.210-0.677, p=0.001), not experiencing side effects of dietary iron supplementation (OR=2.044, 95% CI=1.183-3.532, p=0.010) and not worrying of having a large size of baby (OR=2.751, 95% CI=1.146-6.602, p=0.023) were significantly associated with compliance towards dietary iron supplementation. This study suggests that nutrition education and counselling focusing on the effective ways to overcome side effects of dietary iron supplementation, myths and facts regarding dietary iron supplementation should be provided to pregnant women along with the involvement of their spouses, by targeting those who are from a lower education background. These shall further help in improving their compliance status and thus preventing anaemia during pregnancy.

B39 Marketing of confectionery and sweet beverage products in Malaysia: Facebook vs Instagram

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Food marketing through social media has a major impact on consumer's choices, particularly teenagers and adults. The objective of this research was to compare the frequency of confectionery and sweet beverage products marketing, marketing strategies used and to determine the nutritional claims of products via Facebook and Instagram in Malaysia. Previous studies have been done in developed countries which showed that

unhealthy food was being marketed more compared to healthy food. No such study has been done in Malaysia. This study was a cross-sectional study and was conducted from 1st of April - 30th of June 2019 (3 months) using two social media platforms (Facebook and Instagram). A total of 58 Facebook pages and 63 Instagram accounts were selected through Socialbaker.com website based on active pages and accounts on these media platforms. The results showed that image frequency was the highest at 996 (69%) images on Facebook and 898 (68%) images on Instagram, while 431 (30%) videos were posted on Facebook and 418 (32%) videos on Instagram. There were significant differences in frequency of images and video posts via Facebook ($p<0.05$) and Instagram ($p=0.00$). A total of 21 marketing strategies were used in Facebook and 22 in Instagram. These include brand elements such as logo, trademark and slogan that were 100% used. There was no significant difference in both platforms with the marketing strategies used. With regards to nutritional claims, 13 products on Facebook and 10 products on Instagram made nutritional claims. However, 2 products on Facebook and 3 products on Instagram were found to make false claims when compared with the Malaysia Food Act Regulation 1985. In conclusion, brands are using social media platforms such as Instagram and Facebook to advertise to a growing number of consumers with little to no restrictions. This warrants further attention and more stringent enforcement, and regulation should be made to avoid unauthorized nutrition claims of food that are harmful to public health.

B40 Healthy food choices in school canteen: Psychosocial factor of secondary school students in Malaysia

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The Malaysian government proposed a healthy school canteen guideline to provide healthy and safe food for the school students; however students' understanding or awareness of this guideline, as well as the relationship with their current practice in making healthy food choices in school canteens has yet to be investigated. The current study aims to determine the relationship between Knowledge, Attitude, Perceived Barriers, Self-efficacies and Practice regarding healthy food choices in school canteens among Malaysian secondary school students. This descriptive cross-sectional study design included 300 secondary school students from Form 1, 2 and 4. The data was collected using an online platform and was analysed using SPSS 23. Although 69.0% of the students reported having good knowledge about healthy food choices, only 39.3% reported having a positive attitude. Based on the healthy school canteen guideline, only 15.5% of students reported good practice of healthy food choice. A total of 85.7% of students reported moderate to high levels of barriers while only 3.6% students reported high self-efficacy in choosing healthy food in school canteens. The psychosocial factors of healthy food choice in school canteen revealed that, students' knowledge has a significant moderate relationship with the attitude ($r=0.322$, $p=0.003$), but does not significantly transfer to good practice ($r=0.198$, $p=0.070$). This could be due to low self-efficacy ($r=0.437$, $p<0.001$) and high barriers ($r=0.491$, $p<0.001$) which had a significant inverse and moderate relationship on their healthy food choice practice. A positive attitude has a strong, significant and positive relationship with good practice of healthy food choice in the school canteen. These results showed that, in addition to education, a behavioural change is required to transform to a good practice in healthy food choice in school canteen.

Group C: Nutrients & Other Components in Foods/Products

C01 Determination of anti-nutrients and the effect of blanching in selected underutilised leafy vegetables in Malaysia

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In Malaysia, some of the underutilised leafy vegetables have mostly been eaten as 'ulam' or raw salad but these 'ulam' remained unpopular due to the lack of promotion to the locals despite some studies have revealed its potential as a traditional remedy. Apart from its potential in treating common diseases, these 'ulam' were found to contain some anti-nutrients that might interfere with the absorption of certain nutrients in the human body. The studies on the anti-nutrients in these 'ulam' are still lacking due to the focus on their nutrient constituents. Therefore, the purpose of this study is to determine and compare the anti-nutrients contents (tannins, phytates, saponins) of *Cosmos caudatus* (Ulam Raja), *Euodia redlevi* (Tenggek Burung), *Piper sarmentosum* (Kaduk) and *Diplazium esculentum* (Pucuk Paku) in the raw and blanched samples. The determination of tannins, phytates and saponins was conducted using the Folin-ciocalteu method, colorimetric assay and the double extraction gravimetric method, respectively. The data was analysed by IBM SPSS Statistic 26 version in triplicates. Descriptive analysis was used in the determination of anti-nutrients and one-way analysis of variance (ANOVA) followed by Tukey HSD as the post hoc test with significant difference set at (p<0.05) was used in comparing the anti-nutrients contents between the samples. Results showed that all of the raw samples contained tannins (101.50-412.80 mg/g), phytates (96.19-184.41 mg/g) and saponins (3.69-7.01%). *Diplazium esculentum* showed the highest content in tannins and phytates, while *Cosmos caudatus* showed the highest content in saponins among all the samples tested. Blanching also showed a significant reduction (p<0.05) in the levels of tannins, phytates and saponins for all samples in this study. Hence, blanching can be considered as an effective cooking method that could be used to reduce the level of anti-nutrients and should be recommended in preparing these selected leafy vegetables.

C02 The comparison of sugar and sodium contents in infant commercial complementary foods by different product categories in Johor Bahru, Malaysia

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Commercial complementary foods (CCFs) are convenient to include in an infant's diet because it is easily accessible and widely available in supermarkets. Previous studies outside Malaysia found that some CCFs had excessive sugar and sodium levels, and this is yet to be determined in Malaysia. This study aims to compare the sugar and sodium contents of infant CCFs by different product categories (dry cereals, simple purees, and finger foods) in Johor Bahru. The food label, ingredient lists and nutrition facts of 250 CCFs products were recorded using the content analysis photography method in five randomly selected

supermarkets in Johor Bahru. Products were classified into low/high sugar and sodium contents according to the maximum acceptable amount by WHO. There were 63 (25.2%) dry cereal, 86 (34.4%) simple puree and 101 (40.4%) finger food products that were available at selected supermarkets. There were 45.2% of products that had added sugar ingredients, with the highest being finger foods (79.2%), followed by dry cereals (31.7%) and simple purees (15.5%), ($p<0.001$). Based on the WHO cut-off, eight (3.8%) products contained excessive sugar, which all were finger foods. Whereas 88 (37.6%) CCFs contained excessive sodium, which was mostly finger foods (54.5%), followed by dry cereals (22.8%) and simple purees (22.7%). Finger foods had the highest mean sugar content per 100g (13.95±12.8g) than pureed (10.64±4.5g) and dry cereals (6.51±8.9g), ($p< 0.001$]. Consistently, finger foods had a significantly highest mean sodium content per 100g (145.92±145.9g), followed by dry cereals (89.48±120.1g) and simple purees (31.72±48.4g), ($p<0.001$). Infants consuming foods high in sugar and sodium may pose higher risk of health consequences in future such as overweight, obesity, hypertension, and dental caries. Regulations on the CCFs products ingredients and composition claim shall be regularly monitored in Malaysia to ensure compliance.

C03 Comparative antioxidant contents, antioxidant activity, and mineral contents of fresh and fermented leaves of *Cleome gynandra*

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Cleome gynandra is commonly being used in culinary or treating diseases due to its antioxidant and nutritional properties, in which antioxidants are responsible for reducing the risk of non-communicable diseases related to oxidative stress. In Malaysia, *C. gynandra* is known as *maman*, and it is usually being consumed as pickles and *rendang*. Fermentation is one of the food processing methods that may alter the nutritional value of the foods. Therefore, to know whether it is beneficial to ferment *C. gynandra*, this research was conducted to determine the effect of fermentation on antioxidant contents (total phenolic content and total flavonoid content), antioxidant activity and mineral contents (calcium, iron, magnesium, potassium, and sodium) of the *C. gynandra* leaves. The leaves were either fresh or fermented in the brine solution. Commercial fermented *C. gynandra* leaves was also analysed for comparison. The results showed that fermentation would significantly reduce antioxidant contents, antioxidant activity and minerals contents except for sodium content ($p<0.05$). In contrast, fermentation would significantly increase the sodium content of *C. gynandra* leaves ($p<0.05$). On the other hand, commercial fermented *C. gynandra* leaves had significantly higher antioxidant contents, antioxidant activity and calcium content than self-fermented *C. gynandra* leaves ($p<0.05$). The results might be due to the addition of vinegar in commercial fermented *C. gynandra* leaves. Commercial fermented *C. gynandra* leaves also had higher iron, magnesium and potassium contents but were not significant ($p>0.05$). However, commercial fermented *C. gynandra* leaves had significantly lower sodium content than self-fermented *C. gynandra* leaves ($p<0.05$). In conclusion, a higher level of antioxidant contents, antioxidant activity and mineral contents (except for sodium) suggest that eating raw *C. gynandra* leaves could be more beneficial than eating fermented *C. gynandra* leaves. The addition of vinegar and reduction of salt might be considered during fermentation if fermented *C. gynandra* leaves is preferred.

C04 Total phenolic content, antioxidant, and antimicrobial properties in Kombuchas of tea origins: A scoping review

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Kombucha is a fermented tea beverage concocted using sugar or any carbon source and a symbiotic culture of bacteria and yeast (SCOBY). Kombucha has acetic acid which confers it antimicrobial properties, along with phenolic compounds contained in plants which grant redox properties, therefore granting kombucha antioxidant properties as well. The objective of this scoping review is to determine the factors affecting the total phenolic content, antioxidant activity and antimicrobial activity for kombucha. Databases of *Ovid, PubMed* and *ScienceDirect* were used to systematically search for studies published in year 2010 to 2021 which examined for total phenolic content, antioxidant and antimicrobial properties relating to kombucha teas. The search was restricted to studies that were published in English only. The majority of publications, 22, reported total phenol content while 20 reported antioxidant properties as the study outcome, while only 6 publications reported antimicrobial properties as the study outcome. 5 studies used animal models, namely mice to test the antioxidative effects of kombucha. All studies were of quantitative nature, given how these properties need to be compared using different variables. However, no clinical trials were registered, and as such why COCHRANE did not return any medical reviews pertaining to kombucha usage. The lack of clinical trials found make the benefits hard to apply to the clinical context. So far, kombucha has been shown to attenuate myocardial injury, reduce gastric ulceration, present antidiabetic properties, protect hepatocytes from Tertiary Butyl Hydroperoxide (TBHP) induced damage, and exhibit hypocholesterolemic effects in animal models. Fermentation is shown to improve all three investigated properties for the types of teas included. It is found that Total Phenol Content (TPC) is mostly positively correlated with antioxidant properties. More scientific research needs to be done to determine the factors that produce optimum total phenolic content, antioxidant properties as well as antimicrobial characteristics.

C05 Effects of adding milk, sugar and artificial sweetener to total phenolic content and antioxidant activity of green tea powder (*Camellia sinensis*)

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Camellia sinensis (green tea) is one of the popular functional foods worldwide, due to its strong antioxidant properties. The popularity of consuming sweetened milk tea keeps increasing nowadays. However, it was still controversial on the impact of adding milk, sugar and artificial sweetener to the antioxidant properties of tea and limited studies used green tea powder. Therefore, the present study was to investigate the effects of adding milk, sugar and sweeteners to the total phenolic content and antioxidant activity of green tea. Six green tea samples were prepared: Green tea powder (G), green tea powder with sugar (GS), green tea powder with aspartame (GA), green tea powder with milk (GM), green tea powder with milk and sugar (GMS) and green tea powder with milk and aspartame (GMA) were prepared by using matcha powder, full cream milk, white granulated sugar, and aspartame. The total phenolic content of green tea powder samples was evaluated by using Folin-Ciocalteu assay while α,α-diphenyl-2-picrylhydrazyl (DPPH) and ferric reducing antioxidant power (FRAP) assays were used to measure the antioxidant activity of samples. As a result, milk

addition significantly enhanced the total phenolic content and antioxidant activity of green tea powder (p<0.05) but no significant effect was found between the sweetened green tea by using either sugar or aspartame (p>0.05). Strong and positive correlations were found between the total phenolic content and antioxidant activity of green tea powder by using DPPH (r=0.990) and FRAP assays (r=0.997). In short, it might be beneficial when milk is added to green tea as it could help to increase its antioxidant properties. No significant impact was found in the sugar- or artificial sweetened green tea in this study. However, it is advised to add sugar or artificial sweetener wisely to avoid any unfavorable effects.

C07 Determination of lutein content in leafy vegetables

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Lutein is a carotenoid that must obtained from food. Lutein found in many green leafy vegetables and it is a potential antioxidant that playing a significant role in the prevention of age-related macular degeneration and other non-communicable diseases. This study aims to determine the lutein content in leafy vegetables by using three different extraction methods. The selected samples were microgreens of *Cosmos caudatus* (CC), mature of *Cosmos caudatus* (CC), cassava leaves (*Manihot esculenta* - ME), and sweet potatoes leaves (*Ipomoea batatas* - IB). The quantification of lutein is performed by using reversed-phase high performance liquid chromatography (HPLC). The seeds of CC were obtained from Faculty Food Science and Technology, UPM. The growth medium for microgreens of CC was using mixed soil while the mature of CC, ME, and IB was directly purchased from "Pasar Borong Selangor". After the microgreens of CC reached suitable growing phase, the plants were harvested, all the samples subsequently freeze dried and ground to powder for the determination of lutein. All of the samples contained lutein when run together with lutein standard based on its retention time and area under the curve of HPLC. Result showed that the lutein extracted for microgreens of CC was 4.58 mg/100 g DW for Method 1, 9.73 mg/100 g DW for Method 2, 19.96 mg/100 g DW for Method 3; mature CC was 6.75 mg/100 g DW for Method 1, 12.41 mg/100 g DW for Method 2, 20.89 mg/100 g DW for Method 3; ME was 6.71 mg/100 g DW for Method 1, 6.82 mg/100 g DW for Method 2, 22.68 mg/100 g DW for Method 3; IB was 6.68 mg/100 g DW for Method 1, 10.93 mg/100 g DW for Method 2, and 17.58 mg/100 g DW for Method 3. There was a significant difference between three extraction methods for microgreens of CC, mature CC, ME and IB (p<0.001). All the four samples of leafy vegetables showed the significant difference between each sample which p<0.001 in Method 2 and Method 3. Overall, all samples contained lutein, a carotenoid that good for eyes. Method 3 with tetrahydrofuran is the most effective solvent to extract lutein as compared to acetone and acetonitrile: methanol. Method 3 had exhibited the highest lutein extracted, shortest extraction time, and good chromatogram separation and resolution. It is assumed that ME have the highest lutein content compared to microgreens of CC, mature CC, and IB.

C08 Palm phytonutrients: Nutrigenomic effects on apoptosis

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Nutrigenomic is the effect of nutrient intake in a specific diet on the regulation of gene expression. Nutrigenomic studies are essential to develop personalized dietary, supplements,

and medicinal products. Palm phytonutrients, such as phenolic-enriched fraction (PEF), oil palm phenolics (OPP) and tocotrienols (T3), are used as health supplements and were proven to have nutritional benefits for consumers. These phytonutrients were proven to have nutrigenomic effects on apoptosis. Apoptosis is a cell death program. Apoptosis involves the activation of caspases and the cascade of events related to actuate stimuli to the final demise of the cell. PEF from palm kernel cake upregulated the *nrf2* protein. This protein helps to protect against oxidative damage. PEF also significantly down-regulated the expression of heat shock protein 70 (*Hsp70*) and *caspase-3*, a pro-apoptotic gene. Hsp70 is a protein that restores and maintains the redox homeostasis of cells. Contrarily, OPP increased the expression of *caspase-3* and other pro-apoptotic genes, such as *caspase-9* and Poly (ADP-ribose) polymerase (*PARP*) in a cancer cell line, while reducing the production of anti-apoptotic genes, *Bcl-XL,* and *survivin*. On another note, γ- and δ- T3 could activate a series of specific cellular responses leading to apoptosis in the HeLa cell line. They increased the expression of heat-shock 70 kDa protein 5 (*HSPA5*) and asparagine synthetase (*ASNS*). These are EndoR stress proteins that lead to apoptosis. γ-T3 increased the gene expression of TNF receptor superfamily member 6 (*Fas*), x-box binding protein 1 (*XBP-1*), and C/EBP homologous protein (*CHOP*), while δ-T3 increased the expression of tribbles pseudokinase 3 (*TRIB3*) and stromal cell-derived factor 2-like 1 (*SDF2L1*). These are all pro-apoptotic genes. In conclusion, palm phytonutrients play an important role in regulating the cell populations in tissues and as an anti-cancer agent through apoptosis.

C09 Determination of proximate composition in selected commercial imitation cheese product in local market

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Imitation cheese may be defined as products that are intended to wholly or partially imitate cheese in which milk fat, milk protein or both are partially or wholly replaced by non-milk-based alternatives, principally of vegetable origin. In general, cheese contains high content of saturated fatty acid and may contribute to an increase in the level of low-density lipoprotein cholesterol (LDL-C). Studies reported that higher consumption of energy-dense food and beverages especially high-fat foods are the major cause of obesity and overweight worldwide. Hence, imitation cheese has been introduced not only to provide flavour and functionality of natural cheese at a reduced cost but eventually lower both saturated fatty acid and cholesterol since the animal fat has been replaced by vegetable fat. Proximate analysis was carried out to evaluate nutritional composition such as protein, fat, carbohydrates, moisture and ash contents of five different brands of imitation cheese. Natural cheese which is made from only simple ingredients such as high quality of fresh milk, salt, enzymes and natural colour was used as comparison. All the data were analysed by IBM SPSS Statistic 26 version. One-way ANOVA and post-hoc test were used to determine and compare proximate composition between five brands of imitation cheese and natural cheese. The results showed that imitation cheese contains significantly higher protein and ash (p<0.05) and lower in both fat and carbohydrates than natural cheese meanwhile moisture content was found lowest in natural cheese (p<0.05). Hence, this study showed that based on the content of macronutrients, imitation cheese had better nutritional values compared to natural cheese. However, further work needs to be conducted to determine other components in imitation cheese such as micronutrients, types of fats, maltodextrin and other ingredients used in the processing of imitation cheese.

C10 Effect of different home cooking methods on the content of vitamin C in selected vegetables available in local hypermarket of Kelantan, Malaysia

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Vegetables are one of the food sources rich in vitamin C. Some vegetables can be eaten raw while most of them required cooking treatment. The cooking method can cause a change in the content of vitamin C since vitamin C is water-soluble and vulnerable to heat. This study aimed to investigate the effect of different home cooking methods including boiling, steaming and stir-frying on the content of vitamin C in selected vegetables available in the local hypermarket of Kelantan, Malaysia, which included *choy sum*, round cabbage, cauliflower, broccoli, and carrot. The ascorbic acid in samples was analyzed by high performance liquid chromatography (HPLC, Shimadzu brand) method equipped with a PDA detector. Each vegetable sample had undergone pre-treatment including cooking, homogenization, centrifugation, and filtration prior injection to HPLC's system. The mobile phase used was 0.02 M potassium dihydrogen phosphate (KH_2PO_4) buffer solution pH 2.70. Standard ascorbic acid was used to plot a linear standard calibration curve at concentrations of 10.00-50.00 µg/ml. The correlation coefficient (R^2) obtained from the standard curve was 0.9997 and the regression equation was [y=145975x+40249], which was used to quantify the concentration of ascorbic acid in the samples. Results indicate that the cooking treatment had significantly changed ($p<0.05$) the vitamin C content in vegetables as compared to the raw samples. In general, higher retention of vitamin C was observed after steaming with the lowest retention recorded after stir-frying. Among the sample analyzed, broccoli recorded the highest content of vitamin C after boiling (21.50±0.23 mg/100g), steaming (26.37±0.33 mg/100g), and stir-frying (19.44±0.09 mg/100g). Steaming is the cooking method that best retains the content of vitamin C in the vegetables tested. These findings could encourage the consumers to make a better choice in cooking vegetables for optimum retention of nutrient.

C11 *In vitro* glycaemic index of selected packaged baked products in the local market

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Foods with a high glycaemic index have been linked to a higher risk of diabetes, obesity, cancer, and cardiovascular disease. Packaged baked products are commonly consumed in Malaysia. However, there is a lack of information about the glycaemic index value of packaged baked products in Malaysia. Therefore, this study aims to determine the *in vitro* glycaemic index of selected packaged baked products available in the local market. In vitro method was applied as it is an inexpensive and alternative method to *in vivo.* A total of 6 samples of packaged baked products (cream crackers, cookies with cream, butter cake, chiffon cake, wholemeal bread and bread with chocolate filler) were sampled from the local market in Serdang, Selangor. The samples were assayed for moisture, fat, total available carbohydrate and total starch content. A validated *in vitro* digestion method was used to determine the estimated glycaemic index and glycaemic load. Among the studied samples, moisture content was the highest in wholemeal bread (35.73±0.81). Fat content was the highest in butter cake (32.10±1.02). Cookies with cream have the highest total

available carbohydrate (18.11±0.47). Cream crackers had the highest total starch content (58.63±0.65) while the lowest in chiffon cake (28.72±0.71). The highest eGI value was observed in wholemeal bread (83.79 ± 0.92) and the lowest was in butter cake (50.79±0.60). eGL value was highest in wholemeal (25.30±0.28) and butter cake has the lowest eGL value (7.31±0.09). Significant correlations exist between eGI and eGL (p<0.01). eGI and fat content was significantly correlated too. However, no correlation exists between eGI and total available carbohydrate content among the selected packaged baked products. Nutrients such as starch and fat influence the *in vitro* glycaemic response of the samples studied.

C12 *In vitro* glycaemic index of selected packaged beverages in the local market

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Recent data have showed that sugar sweetened beverages (SSBs) were highly consumed not only among middle-aged people but also among the youth. Excessive consumption of SSBs was reported to have a relationship with the increase of the NCDs risk especially on the overweight, obesity, and type II diabetes. However, the information regarding glycaemic index (GI) of packaged SSBs from the local market is scarce. GI information is useful for the consumer to help in opt for healthier diet.Thus, this study aimed to determine the GI value of six packaged SSBs from the local market using the *in vitro* method. Besides, this study also estimated the glycaemic load, which is more representative for the comparison of glycaemic response. The beverages were purposely chose based on their macronutrients and sugar content obtained from the market survey. All analyses were conducted in triplicates for each sample. Results showed that estimated GI value for carbonated beverage, canned coffee, fruit juice with sacs, yogurt beverage, soybean milk, and full cream milk were 54.21±0.01, 46.97±0.19, 44.95±0.07, 44.19±0.07, 40.73±0.03 and 39.95±0.02, respectively. While the estimated GL for canned coffee, fruit juice with sacs, yogurt beverage, full cream milk, carbonated beverage and soybean milk were 13.05±0.05, 12.9±0.02, 7.6±0.01, 5.9±0.01, 5.7±0.01 and 5.4±0.00, per serve, respectively. The results also reported there was no significant correlation between the estimated glycaemic index with the glycaemic load and the analysed total available carbohydrate of the studied beverages. As all the estimated GI of the beverages lies below 55, it can be concluded the studied samples can be classified into low-GI beverages. Therefore, these findings might be useful in enhancing the national data on GI, besides increases health awareness among local consumers.

C13 Proximate values, amino acid composition and protein quality of cooked *moringa oleifera* leaves with the addition of chicken egg

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Protein is the essential macronutrient that must be included in dietary meals which mainly crucial for the growth of human body. Plant protein can be used as an alternative protein sources for vegetarians and low-income families that cannot afford animal protein, therefore helping to reduce protein energy malnutrition (PEM). Partial replacement or substitution

of protein sources derived from the animal with plant protein to meet the human amino acids demand are suggested as it improves health status and sustainability. However, these complementary strategies have limited approaches due to the insufficient evidence of research delivered regarding absolute data on the quality of the protein complementation. The present study was conducted to evaluate the proximate values, amino acid composition and protein quality of raw *Moringa oleifera* leaves (RMO), cooked *Moringa oleifera* leaves (CMO) and cooked *Moringa oleifera* leaves with the addition of chicken egg (CMOE) using the animal study. Male Sprague-Dawley rats, around 80 grams after adaptation, were placed in cages and fed treatment diets that were contained 20% CMO, 20% CMOE and 20% Casein as sources of protein in the diet. A diet containing 20% of casein protein as the main sources of dietary protein was used as a standard protein control. After three days, feces were collected for a period of four days and analyzed together with diet samples for crude protein contents. Proximate values, amino acid composition, true protein digestibility (TPD), amino acid score (AAS), and protein digestibility-corrected amino acid score (PDCAAS) were calculated. Proximate values (moisture content, ash content, total available carbohydrate content, fat content and protein content) was measured using a standard laboratory procedures and the percentage was calculated. The present study found that the RMO contained 78.6% moisture, 8.5% ash, 11.1% total available carbohydrate, 9.2% fat, 35.8% protein whereas the CMO contained 76.3% moisture, 7.5% ash, 11.0% total available carbohydrate, 19.2% fat, 30.4% protein and lastly CMOE contained 72.6% moisture, 5.6% ash, 10.4% total available carbohydrate, 30.4% fat and 45.1% protein. The moisture, ash, fat and protein showed significant findings among RMO, CMO and CMOE. However, no significant difference was observed in the total available carbohydrate content among RMO, CMO and CMOE samples. The AAS of the first limiting amino acid was 0.50, 0.53, and 0.70, TPD was 88.3%, 81.0%, and 86.4% and PDCAAS was 44.2%, 42.9%, and 60.5%, respectively, for RMO, CMO, and CMOE. Protein complementation significantly improved protein content, amino acid composition and protein quality. The results suggest that the CMOE are acceptable sources of protein for humans and quality can be markedly improved by protein complementation.

C14 *In vitro* glycaemic index of selected canned foods in the local market

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Health issues on food intake with a high glycaemic index become alarming these days as it contributes to non-communicable diseases. The high consumption of canned food has grabbed the attention of healthcare professionals because of its nutrient composition as processed foods that include a high amount of sugar, fat, carbohydrate, sodium and others that negatively affect health. Based on observation of research surveys, the determination of *in vitro* glycaemic index is still lacking, and most researchers studied starchy-rich foods but limited on canned foods. Thus, this study determined the *in vitro* glycaemic index of the selected canned foods (fruits-lychee in heavy syrup (LHS), vegetables- sweet corn cream style (SCCS), pulses- baked beans in tomato sauce (BBTS), meat- beef curry with potatoes (BCWP) and poultry- chicken curry with potatoes (CCWP) and milk- sweetened creamer (SC) in the local market. This study aims to provide data of glycaemic index for researchers and manufacturers as limited information is available on canned food products in the local market. Comparison of means among the analysed food samples was computed using ANOVA Tukey's test. Bivariate Pearson' correlation was used to determine the association in this study. The findings of this study on estimation of GI (eGI) among the selected canned foods were based on glucose as the reference food. The data obtained showed that canned SCCS and LHS had high eGI of 57.48±0.41 and 57.39±0.46, respectively. The

BCWP (41.66±0.09) and SC (41.35±0.10) had the lowest eGI among the analysed canned food. The findings also found no significant correlation between eGI and eGL [$r(18)=0.430$, $p=0.075$]. All in all, the findings of this study may provide data on the estimation of GI values for the selected canned foods in the research field.

C15 Nutraceutical potential, phytochemical content, and antioxidant activity in lettuce: A scoping review

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Lettuce has been considered as a health-promoting fresh food and thus lettuce consumption has increased gradually due to its perception. However, the nutritional values of the lettuce always being underestimated even though lettuce is one of the most widely consumed vegetables worldwide. This scoping review identified the nutraceutical potential and reviewed the phytochemical content and antioxidant activity in lettuce. From the PubMed database, 15 journal articles were chosen based on the inclusion and exclusion criteria. All articles chosen in this review were from an experimental study, which were animal research studies (in vivo) and plant culture (in vitro) studies. The results from this review showed that lettuce could produce the nutraceutical effects such as anti-proliferative, anti-diabetic, anti-cancer, and sleep prolonging effects, which had been tested on the mice and rats. Out of six studies that produced the nutraceutical effects, four studies involved the red leaf lettuce, and the remaining involved the green leaf lettuce. Polyphenols compounds like total phenolic acid, hydroxycinnamic acid, hydroxybenzoic acid, flavonoids, anthocyanin, carotenoid, and total ascorbic acid content were reported to have a significant increased with $p<0.05$ and $p<0.0001$ under all treatments conducted in the study. Distinct studies affected the compounds tested in different ways because the same compounds might increase and decrease in experiments conducted. This scoping review revealed that genetic modifications and novel agronomic techniques such as nutrient solution management and elicitation factors could improve the phytochemical content and antioxidant activity, which can produce higher nutraceutical effects. These techniques could be implemented in the agriculture field to increase the lettuce yield with high nutrient density.

C16 The effects of cucurbitaceae and bitter melon (*Momordica charantia*) on diabetes mellitus: A scoping review

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The worldwide trend has shown a significant increase of diabetes due to unhealthy diet and sedentary lifestyle. Statistics show that 9.4% of Malaysian adults were diagnosed with diabetes while 8.9% of Malaysian adults were suffering with raised blood glucose (NHMS, 2019). Malaysia is surrounded by an abundance of plants/herbs that are beneficial to our health. One of the most famous plants used traditionally in treating diabetes is from the Cucurbitaceae family. This present study undertakes a scoping review of research on identifying and summarizing recent findings available on the Cucurbitaceae family, focusing on *Momordica charantia* (MC) regarding the type of active compounds isolated, mechanism of actions, effect on animal model and human clinical trials on T2DM. Online databases selected to identify published articles are PubMed, Science Direct, Wiley Online Library, CINAHL-EBSCO and manually searched as cross- references from review articles. 284 articles were screened on the title, abstract and in full text. However, only 28 articles were chosen based on few eligibility criteria (English language, published in 2011-2021

and related to research questions and objectives) after removing duplicates. The majority of publications included are review articles (n=11), only some of them are original articles that are classified according to study design including *in-vitro* study (n=5), *in-vivo* on animal models (n=5) and clinical trials on humans (n=7). These results show that current evidence is still limited and inconclusive to determine the effectiveness of MC to treat T2DM directly, but it is highly potential to be explored due to many positive results on its significant association in lowering fasting blood glucose, insulin level and reducing the risk of insulin resistance. Thorough research should be conducted in the future especially in clinical trials with more participants for more conclusive and reliable results. Systematic review for this topic is highly recommended.

C17 Comparison of total phenolic content, antioxidant, and antimicrobial properties in fermented tea beverages using different types of tea

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The influence of fermentation factors including fermentation substrate and duration on the production of beneficial bioactive components and functional properties in fermented tea beverages (FTB) has rose the research concern due to the growing awareness towards health and functional food. This study aims to compare the effects of applying three types of tea, namely Matcha, post-fermented Pu-erh, and hibiscus tea on physical activities, total phenolic content, antioxidant, and antimicrobial properties in FTBs. The physical properties including pH, total acidity, and total soluble solids, total phenolic content, half maximal inhibitory concentration (IC50) against DPPH radicals and log reduction of total plate count were measured at day-1, day-7, and day-14 of fermentation for the FTBs prepared with Matcha, post-fermented Pu-erh, and hibiscus tea. The physical properties at day-14 of fermentation reported significant differences, in which pH of FTB from three types of tea different significantly (p<0.001), total acidity of hibiscus FTB was significantly higher than Matcha (p<0.05) and post-fermented Pu-erh (p<0.05), and total soluble solids of Matcha FTB was significantly higher than post-fermented Pu-erh (p<0.05) and hibiscus tea (p<0.001). Post-fermented Pu-erh FTB showed significantly higher total phenolic content than that of Matcha (p<0.05) and hibiscus tea (p<0.05). For antioxidant property against DPPH radicals, hibiscus FTB was significantly weaker than Matcha (p<0.05) and post-fermented Pu-erh (p<0.05). However, there is no significant difference in antimicrobial properties of FTB prepared from Matcha, post-fermented Pu-erh, and hibiscus tea (p>0.05). Therefore, these results conclude that the variation in the tea types influences the total phenolic content, physical, antioxidant, and antimicrobial properties of FTB. The study contributes to the discovery of the use of novel tea substrate, thus, providing alternatives to ferment FTB. This results in the improvement of FTB quality in terms of variation of bioactive components and functional properties.

C18 Nutritional composition and antioxidant activities of selected popularly consumed local and imported herbs

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Antioxidants are always related with various diseases. Herbal plants are promising sources

of essential nutrients and antioxidants. In this quantitative experimental study, Salvia *miltiorrhiza* Bunge, *Scutellaria baicalensis*, *Plectranthus amboinicus* and *Vitex negundo* were chosen to investigate their proximate composition, total phenolic content, total flavonoid content and antioxidant activities. Significant differences (p<0.05) were shown in the parameters of proximate composition, total phenolic content, total flavonoid content and antioxidant activities of the four samples. This study suggested that dried *Plectranthus amboinicus* is a promising source of ash (21.46±0.16%) and dietary fibre (41.24±1.25%) while dried *Vitex negundo* contained higher amount of crude fibre (19.41±1.98%) as compared to other samples. Besides, this study also highlights the antioxidant capacity of aqueous extract of dried Salvia *miltiorrhiza* Bunge as it showed a good performance in the parameters of total phenolic content (105.90±3.37 mg GAE g^{-1}), total flavonoid content (241.55±55.15 mg QE g^{-1}), DPPH radical scavenging activities (IC_{50}: 169.10±14.17 ug/ml) and FRAP (103.09±2.84 uM $FeSO_4$ E g^{-}). Other samples also showed average performance in the antioxidant test. This study has successfully found that the proximate composition, total phenolic content, total flavonoid content and antioxidant activities were affected with different species of samples chosen.

C19 Total phenolic content, total flavonoid content and antioxidant capacity of 80% ethanol and water extract from white mulberry (*Morus alba*) fruits, leaves and stems

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Mulberry plant contains 24 species and at least 100 varieties. One of the subspecies is *Morus alba*, which is the dominant species located in tropical, subtropical, and temperate countries. This plant is rich in antioxidant that can help prevent various health problem and provide health benefits. Mulberry has been widely used for both functional food and medicinal purposes. It has also been selected as medicinal and edible plant by Ministry of Health of China since 1985. Depending on its cultivation and maturity levels, many nutritional compounds such as vitamins, minerals, amino acids, fatty acids, bioactive compounds, including anthocyanins, rutin and chlorogenic acid were found in mulberry fruits, leaves and stems. The present study was aimed to determine the total antioxidant contents and antioxidants capacities of different parts of *Morus alba*. All the samples were collected through convenient sampling in Selangor. 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. Results showed there were significant differences (p<0.05) of total phenolic content between 80% ethanol extract and water extract, whereby ethanolic extracts showed significant increased in TPC. Besides, ethanolic extract samples of fruits, leaves, and stems significantly increased (p<0.05) in TFC. There was no significant difference (p>0.05) in DPPH between 80% ethanol extract and water extracts. Furthermore, there was no significant difference (p>0.05) of FRAP value between 80% ethanol extract and water extract. To conclude, this study had provided a rough estimation of total antioxidant content and antioxidant capacity of mulberry fruits, leaves and stems with 80% ethanol and water extract. Therefore, *Morus alba* can be used as one of the sources of natural antioxidant for various food application.

Group D: Clinical Nutrition / Intervention Trials

D01 A web-based childhood obesity prevention program for preschool's child-parent dyads: Protocol for a cluster randomized controlled trial

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The primary objective of the present study is to compare the changes in the child BMI-for-age z-score at 3- and 9-month after baseline measurement (3 months intervention program and 6 months follow-up). The secondary objectives of the present study are to compare the changes in child dietary intake, child physical activity, child health-related quality of life, parental self-efficacy, parental role modeling, and parental policies at 3- and 9-month after baseline measurement. The Interactive Malaysian Childhood Healthy Lifestyle Program (i-MaCHeL) is a single-blind, two-group cluster randomized controlled trial that evaluates the effectiveness of the obesity prevention intervention on preschool's child-parent dyads. The i-MaCHeL program consists of 13 modules that focus on healthy eating, active physical activity, and screen time. In recognition of the value of multiple theoretical approaches, the strong theoretical basis consists of Social Cognitive Theory, Health Belief Model, and Trans-Theoretical Model principles underpinning the development of the i-MaCHeL intervention. The participating preschools (n=12) will be randomized to either the experimental or control group in a 1:1 ratio, which will involve 460 child-parent dyads of preschool children aged 5 and 6 years old in Terengganu, Malaysia. The preschool children in the experimental group will be received the i-MaCHeL program delivered through classroom instruction, and their parents will have access to the i-MaCHeL Web-based program. In the control group, the preschool children will be received a standard preschool health education curriculum, and their parents will have access to the general Web-based health newsletters. Anthropometric measurements (body weight and height) will be assessed. The dietary intake of children will be measured using dietary records for three days. Child physical activity, child health-related quality of life, parental role modeling, parental policies, and parental self-efficacy will be assessed using previously validated questionnaires. The i-MaCHeL intervention is unique, given its Web-based approach to enhance the tool's adoption with hard-to-reach populations, contributing to the long-term goal for childhood obesity prevention. In conclusion, the combination of the classroom instruction and the Web-based program will have a strong potential to be effective strategies to sustain child-parent engagement and participation in the obesity-related behavior change program.

D02 The effects of taste sensitivity and repeated taste exposure on children's intake and liking of a bitter vegetable

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Low consumption of vegetables in children is a concern around the world, hence approaches aimed at increasing intake are highly relevant. Previous studies have shown that repeated taste exposure is an effective strategy to increase vegetable acceptance. However, few studies have examined the effect of repeated taste exposure on children varying in bitter taste sensitivity. This study investigated the influence of taste genotypes and phenotypes on the effects of repeated taste exposure to a *Brassica* vegetable. 172 preschool children aged 3–5 years were recruited into this study. Turnip was selected as the target vegetable and parents completed a questionnaire to ensure unfamiliarity. During the intervention, children were exposed to steamed-pureed turnip for 10 days (once/day). Intake and liking were measured before, during and after the intervention, and a follow-up was done 3 months post-intervention. Taste genotypes (*TAS2R38* and gustin (*CA6*) genotypes) and taste phenotypes (PROP taster status and fungiform papillae density) were determined. There was a significant effect of exposure shown by significant increases in intake (p<0.001) and liking (p=0.008) post-intervention; however, there were no significant effects of taste genotypes or phenotypes on intake and liking. In summary, repeated taste exposure is confirmed to be a good strategy to increase vegetable acceptance in children, regardless of bitter taste sensitivity.

D03 Development of health education module for HEAL@ work program in promoting healthy lifestyle among healthcare employee: Worksite setting

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This paper describe the development of health education module namely HEAL@work (Healthy Eating, Active Moving and Healthy lifestyle) used in intervention program. The main objective of this module was to promote healthy lifestyle among healthcare workers. The present study was conducted into three phases: For phase I was composed the need of assessment with review of literature and interviewed with expert members. The need of assessment with the expert member was done to assess the overview and opinion's regarding the content of module. Phase II: was the development of health education module and for Phase III, was the content and face validation. A content validity stated was set to achieve the content validity index more than 0.79 which considered acceptable the standard validation. From need assessment, it indicate the framework content of health education module. Module developed for employees including; determine healthy lifestyle goals, healthy weight management, guideline for healthy eating and stay healthy and active. The validation stage was carried out with four experts including, nutritionist, dietitian, physical exercise and psychologist. The module has an acceptable standard of content validity index (CVI: 0.85), however, experts made suggestion and the module was modified accordingly. As a result, the module is ready to be used as a guidance of intervention in the healthy lifestyle intervention.

D04 Tocotrienol's protective and therapeutic effects in rheumatoid arthritis (RA)

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The current invention relates to a pharmaceutical composition for treating arthritis with Tocotrienol Rich Fraction (TRF) from palm oil in bovine chondrocyte cultures, in arthritic rat model, and a clinical trial. Arthritis is a joint inflammation disorder. It destroys articular cartilage and increases catabolism of the cartilage proteoglycan aggrecan. Synthetic drugs appear to have many side effects. Anti-inflammatory drugs (NSAIDs) are commonly used to treat arthritis, but their long-term use may cause unwanted side effects. Antioxidants from natural sources/food sources like Tocotrienols are needed to reduce cartilage destruction and stop arthritis in its tracks. *In vitro*, bovine chondrocyte cultures treated with γ-T3 and IL-1α successfully reduced COX-2, IL-1α, IL-6, and TNF-α mRNA expression. Arthritic rats supplemented with TRF had lower articular index scores, ankle circumferences, paw volumes, and radiographic scores than untreated rats. The TRF composition reduces joint inflammation, cytokines expression, and C-reactive protein (CRP). Conversely, it increases the arthritis rat's bone mineral density. A clinical trial is underway to assess TRF's therapeutic efficacy in RA patients. With moderate disease activity scores (DAS) in 28 joints, this independent randomised controlled pilot study aims to examine the therapeutic effects of TRF. For 6 months, patients took TRF or placebo capsules. They were screened as part of a routine Rheumatology visit at Hospital Serdang. Patients' blood was drawn for analysis. The study should be finished in June 2022. Based on previous research *in vivo* and *in vitro,* TRF may be useful in reducing arthritis-related inflammation.

Group E: Food Science & Technology

E01 Development and sensory evaluation of egg custard pudding using isomaltulose

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High consumption of sugar is associated with positive energy balance which leads to obesity, a risk factor of diabetes. High demand for sugar intake has brought concern on sucrose substitution. Therefore, replacing sucrose with isomaltulose (IM) seems feasible due to its low glycaemic index and non-cariogenic properties. Nevertheless, studies regarding sucrose substitute with IM in desserts, sensory evaluation and overall acceptability are limited in Malaysia. This study aims to determine the sensory attributes and overall acceptability of egg custard pudding made with IM. A total of 40 Chinese Malaysian adults aged 18 to 50 years old were recruited from Klang Valley. The egg custard pudding was prepared in three variations which are 100% sucrose, 100% IM and 50% sucrose: 50% IM for participants to complete sensory evaluation. Sensory attributes and overall acceptability were evaluated

by 5-point hedonic scale while sweetness was assessed using Just-About-Right scale. Duo-trio test was carried out to identify the variation close to the reference (100% sucrose). Under affective test, appearance (p=0.001) and sweetness (p<0.001) were significantly different between three pudding groups while aroma (p=0.768), taste (p=0.136), texture (p=0.502) and overall acceptability (p=0.549) had no significant difference. Among the three variations, appearance (3.95±0.75) and aroma (3.53±0.85) of the 50% sucrose:50% IM pudding was top-rated. Texture (3.95±0.88) of 100% sucrose pudding obtained highest score. Taste (4.03±0.86) and overall acceptability (3.85±0.86) of 100% IM pudding were ranked the highest. Sweetness (2.90±0.59) of 100% IM pudding was the nearest to just-about-right (score=3). In duo-trio test, 33 participants (82.5%) chose 50% sucrose:50% IM while seven (17.5%) chose 100% IM as the similar sample to reference. Present study suggested the incorporation of IM to substitute sucrose is applicable in egg custard pudding and 100% IM pudding was the most acceptable by the subjects with highest score obtained in overall acceptability.

E02 Food safety and hygiene knowledge, attitude and practices among food handlers at food factories in Pontian, Johor during COVID-19

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The current COVID-19 pandemic situation might affect the food safety aspect in the food business to keep the workers safe and maintain current good manufacturing practices. The purpose of this study is to measure the current food safety and hygiene knowledge, attitude, and practices level among food handlers in a few food factories in Pontian, Johor. A descriptive cross-sectional study design was used from October 2020 to July 2021. Food safety and hygiene KAP surveys were administered on 104 food handlers. The current study shows that the food handlers have adequate knowledge, positive attitude, and satisfactory practices regarding food safety and hygiene during COVID-19 with the mean score (SD) of 85.40 (8.24), 87.95 (14.60), and 78.85 (21.83), respectively. There is no significant association between the demographic characteristics of the food handlers with their current KAP level found in this study. Meanwhile, there is a significant relationship between their knowledge and attitude (p<0.001), knowledge and practice (p=0.006), and attitude and practices (p<0.001) score towards food safety and hygiene. However, even though the results show satisfactory KAP levels of the food handlers, some aspects of hand hygiene measures like washing hands are greater protection, and the needs of washing hands regularly before, after, and in between gloves changes, need to be emphasized, especially during this pandemic situation.

E03 Sensory evaluation of castella cake made with isomaltulose

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Isomaltulose, a low Glycaemic Index carbohydrate sugar was reported to have beneficial effect towards blood sugar control, hence a potential alternative to sucrose in desserts. However, the consumer acceptability of desserts replaced with isomaltulose was not studied extensively. The objective of the study is to determine the sensory attributes and consumer

acceptability of the Castella cakes made with isomaltulose through sensory evaluation. A sensory evaluation was conducted on 40 Chinese adults aged 18 to 50 years old where three ratios of Castella cake with different sugar content (100% sucrose, 100% isomaltulose and 50% isomaltulose:50% sucrose) was being tested. The participants were asked to taste and evaluate the cakes based on their sweetness, aroma, appearance, taste, texture and overall acceptability and were asked to choose the most identical sample with the reference sample. The score of each cake were collected through five-point hedonic scale (where five being the highest score and vice versa), Just-about-right scale for sweetness and duo-trio test for similarity comparison. The overall acceptability of the 50% isomaltulose:50% sucrose Castella cake receive a higher mean score of 3.85±0.89 as compared to 100% isomaltulose with a mean score of 3.35±1.05. A pairwise difference (p<0.05) between reference and 100% isomaltulose was observed for all of the sensory attributes. For duo-trio test, 90% of subjects thinks 50% isomaltulose:50% sucrose cakes resemble reference sample the most. Reference sample received the highest mean score consistently for all of the sensory attributes followed by 50% isomaltulose:50% sucrose, while 100% IM cakes are the least acceptable amongst the three samples. IM may not be suitable for cakes product which requires separate handling of egg whites and egg yolks such as Castella cake. The present study shows that half substitution of sucrose with 50% of IM is more acceptable than full substitution.

E04 Nutritional and fatty acid profiles in beef patty formulated with brown rice and rice bran oil

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Brown rice is one type of commonly consumed whole grain in which the essential layers of the rice grain are still intact. Rice bran oil (RBO) is a valuable by-product of the rice milling process, that is rich in dietary fibre and also contains, starch, minerals, and dietary minerals. Our populace is exposed to the massive promotional and persuasive advertisement of unhealthy food products. Approximately, 95% of Malaysian adults equal to 19 out of 20 do not eat a sufficient amount of dietary fibre as recommended. Thus, this study is conducted to determine the nutritional and fatty acid profiles in beef patty formulated with brown rice and rice bran oil. The proximate composition was determined using standard methods of AOAC. Each raw sample was homogenized and manually chopped as pre-preparation. Fatty acid profiles of beef patties are extracted with the Soxhlet technique and detected by using gas chromatography-mass spectrometry (GC-MS). After the Soxhlet extraction, the essential oil of beef patties was transformed into fatty acid methyl ester (FAME). The result shows that the beef patty formulated with 75% RBO uncooked and cooked recorded the highest concentration of total dietary fibre (TDF) at (14.43g/100g and 13.91g/100g) compared to beef patty containing 25% of RBO for uncooked and cooked (9.89g/100g and 10.06g/100g). There are 8 types of fatty acids found in both uncooked and cooked beef patties (C14:0, C16:0, C16:1n-7, C17:0, C18:0, C18:1n-9, C18:2n-6, and C20:0). The fatty acid profiles of cooked beef patty formulated with 75% RBO recorded the highest percentage of C18:1n-9 which was 53.17% compared to the uncooked beef patty with 75% of RBO (50.52%). Replacement of patty fat with oil rich in monounsaturated fatty acids, such as rice bran oil, and brown rice as a good source of dietary fibre may improve the oxidative stability, and nutritional value.

E05 Sodium caseinate edible film incorporated with *Bifidobacterium breve* M-16V

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The usage of plastic films causes severe environment contamination. Hence, the development of edible packaging could reduce the usage of plastic films. Besides that, the incorporation of probiotic bacteria in edible films creating an added value to the food product includes providing health benefits, preserve food quality, and promote the antimicrobial property. This study aimed to produce sodium caseinate (NaCas) edible film with *Bifidobacterium breve*, where its physical properties (thickness, water solubility and colour) were determined. The edible film was prepared by using NaCas powder (2, 3, 4, 5, 6% w/v), glycerol (1% w/v) and *B. breve* suspension (1% v/v). Edible films without probiotics were used as control films. The different concentration of NaCas had an effect on thickness, water solubility and colour profile. The thickness increase and water solubility decrease as the concentration of NaCas increase. The increase in NaCas concentration resulted in the decrease in lightness and increase in yellowness and greenness. The concentration of probiotic edible film with the most desirable characteristic was displayed by 3% (w/v) with 0.16 mm thickness, 63.50% water solubility, 23.43 for L^* value, -0.36 for a^* value and 0.78 for b^* value. The NaCas-*B.breve* films developed in this study indicated various desirable characteristics, which may enable their future use as bioactive packaging for food products.

E06 Development and sensory evaluation of burnt cheesecake made with sucrose and isomaltulose

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Diet with low glycaemic index foods has shown to induce a slow rise in blood glucose level and lower insulin levels to prevent T2DM development in the long run. The rising trend of sugar consumption and T2DM prevalence increased the demand for healthier sugar alternatives. Isomaltulose (IM) is a sugar reported to substitute sucrose due to its low GI. Currently, there are no studies on the effect of IM on sensory attributes in burnt cheesecake. The objective of this study was to develop a standardised recipe of burnt cheesecake with IM to replace sucrose and compare its sensory attributes and consumer acceptability with the burnt cheesecake made with sucrose. A randomised, acute-feeding trial was conducted on 40 subjects. For eligibility screening, a sociodemographic questionnaire was given. Duo-trio test was used to identify the burnt cheesecake closest to the reference sample. The type and sugar ratio were altered to produce three different samples [100% IM, 50 IM: 50, 100% sucrose (reference)]. Subjects were given a sensory evaluation form containing a 5-point hedonic and Just-About-Right scale to evaluate the attributes after tasting. ANOVA repeated measures showed significantly lower mean scores of burnt cheesecakes made with 100% IM and 50 IM: 50 sucrose compared to reference sample in terms of taste, aroma, sweetness intensity and overall acceptability ($p<0.05$). Mean scores for sample made with 100% IM and 50% IM: 50% sucrose were not significantly different compared to reference sample ($p>0.05$); appearance (4.00±1.06 and 4.10±0.90 vs 4.30±0.76, $p=0.202$) and texture

(3.45±1.18 and 3.65±1.05 vs 3.93±1.00, p=0.063). The taste, aroma, sweetness intensity and overall acceptability scored higher for reference sample compared to sample made with 100% IM and 50 IM: 50 sucrose. The scores for appearance and texture did not vary by a lot when the same comparisons were made between all the burnt cheesecakes.

E07 Physicochemical properties of Kelulut honey adulterated with different percentages of rice syrup

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Kelulut honey becomes prominent and valuable in the honey market due to its abundant health benefits. However, many adulteration cases of Kelulut honey have been reported nowadays. Rice syrup is one of the emerging adulterants used in Kelulut honey, and it may affect the quality of honey. This study aims to develop quality assessment of adulterated Kelulut honey with different percentages of rice syrup. The quality of adulterated honey was assessed by determine the physicochemical properties such as moisture content, electrical conductivity and hydroxymethylfurfural of Kelulut honey added with 0 % to 100 % (w/w) of rice syrup. Results showed that the moisture content (28.58±2.06 - 16.89±0.46), electrical conductivity (0.441±0.005 - 0.029±0.002), and hydroxymethylfurfural content (446.74±4.56 - 167.03±10.43) of the samples decreased when the adulterated percentage of rice syrup in Kelulut honey increased. However, the moisture content of adulterated Kelulut honey samples with different percentages of rice syrup were also within the standard of pure Kelulut honey in the Malaysian Standard (2017) meanwhile HMF content of pure honey sample did not comply with the Malaysian Standard (2017). Malaysian Standard (2017) might not be a suitable standard to determine the adulteration of rice syrup in Kelulut honey as it is designed to assess the quality of Kelulut honey only.

E08 Determination of anti-nutrients content before and after heat treatment in selected underutilised leguminous plants in Malaysia

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Legumes belong to the Fabaceae family of Angiospermae. They are known to be rich in high-quality proteins with a profound impact on nutrition, diet, and health. However, the presence of anti-nutrients such as tannin, saponin and phytate in legumes reduces the bioavailability of minerals and protein digestibility. Therefore, this study was aimed to determine the content of selected anti-nutrients in *Pithecellobium jiringa* (Jering), *Pithecellobium bubalinum* (Kerdas), *Parkia speciosa* (Petai), and *Psophocarpus tetragonolobus* (Kacang botor) before and after heat treatment. The determination of tannins, phytate and saponin in raw and blanched (blanching for 3 minutes) samples were conducted using the Folin-ciocalteu method, colorimetric assay, and the double extraction gravimetric method, respectively. The data of the study were analysed using one-way ANOVA. The results of raw samples showed that total saponin content ranged between 0.10±0.01%

to 0.28±0.00%, total tannin content ranged between 3.81±0.80 to 29.63±2.88 mg TAE/g sample and total phytate content ranged between 0.90±0.24% to 1.16±0.01%. Meanwhile, the results of blanched samples showed that the total saponin content ranged between 0.07±0.05% to 0.21±0.03%, tannin content ranged between 1.07±0.10 to 12.78±1.67 mg TAE/g sample and total phytate content ranged between 0.15±0.13% to 0.47±0.03%. From the finding, heat treatment method (blanching) significantly reduced saponin content in *Pithecellobium jiringa* and *Pithecellobium bubalinum*, tannin content in *Pithecellobium jiringa* and *Psophocarpus tetragonolobus* and phytate content in all four samples. However, blanching did not significantly reduce the total saponin content in *Parkia speciosa,* and *Psophocarpus tetragonolobus* and tannin content in *Pithecellobium bubalinum* and *Parkia speciosa.* To conclude, this study shows that most of the anti-nutrient contents in the samples studied were easily reduced by heat treatment.

E09 Physicochemical characteristics of frozen Ceri Terengganu pulp

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Ceri Terengganu or its scientific name as *Lepisanthes fruticosa* is found growing naturally in the forests and now the fruits are also being cultivated. Currently, many researches has tended focusing on the consumption of colourful fruits due to the presence of various beneficial phytochemicals and processing of Ceri Terengganu for food ingredients are good efforts to preserve the benefits of plant materials. In the present study, Ceri Terengganu was processed using different steaming time and was evaluated for their physicochemical properties. Four treatments of steam blanching were given namely, 3 min (F3) and 7 min (F7) and kept at freezing temperature and also 3 min (R3) and 7 min (R4) and kept at room temperature. Ceri Terengganu with no treatment is consider as Control (C0). R7 showed lower in moisture content (80.56±0.04) and significantly different ($p<0.05$) with F7 (83.21±0.13). However, Vitamin A as beta carotene drastically lower in R7 (11.97±3.19) as compared to F7 (30.84±2.65). The physical characteristics of the products kept at two different temperatures were different each other in pH, total soluble solid and colour. Interestingly, two types of storage conditions give choices to the manufacturers and consumers in selecting their fruit pulp. Moreover, the pre treatment studied with proper storage conditions are sufficient and may impart health benefits when consumed or processed and therefore can be suggested as a good raw material source of functional food.

E10 Effects of adding animal-based (whole) milk and plant-based (soy, almond) milk on total polyphenols content and antioxidant activity in dark chocolate

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Dark chocolate with ≥70% cocoa solids has been claimed as functional food due to its polyphenols-rich properties. Chocolate is commonly incorporated with milk to be consumed as chocolate milk. However, inconsistent findings were reported regarding effects of adding milk into chocolate on its antioxidants properties. Moreover, types of milk used were also unclear. Hence, this study aims to determine the effects of adding whole milk

(DCWM), soy milk (DCSM) or almond milk (DCAM) on the total polyphenols content and antioxidant activity in 85% dark chocolate. The total polyphenols content (TPC) of each sample was estimated through the Folin-Ciocalteu method, while antioxidant activities (AA) were determined through 2,2-diphenyl-1-picrylhydrazyl (DPPH) and Ferric Reducing Antioxidant Power (FRAP) assays. Results showed that TPC in dark chocolate (8.06±0.11 mg GAE/ml) is significantly enhanced after adding whole milk (15.68±0.17 mg GAE/ml), almond milk (13.16±0.09 mg GAE/ml), and soy milk (11.48±0.06 mg GAE/ml) (p<0.001). In terms of AA, DCWM (90.0±0.75%), DCSM (82.6±1.54%), and DCAM (94.9±1.13%) possess higher DPPH scavenging ability than dark chocolate (64.0±2.39%) alone (p<0.001). The FRAP values of dark chocolate (95.94±2.94 µmol TE/L) is also increased after adding whole milk (133.67±1.55 µmol TE/L; p<0.001), almond milk (325.67±14.91 µmol TE/L; p<0.001), and soy milk (98.61±2.23 µmol TE/L; p=0.999). Strong and positive correlations are found between TPC with DPPH scavenging ability (r=0.714, p<0.01) and FRAP values (r=0.741, p<0.01) in chocolate milk samples. The TPC and AA among milk from highest to lowest are almond milk > whole milk > soy milk. Overall, our study revealed that both animal-based and plant-based milk could enhance antioxidants properties when combined with 85% dark chocolate, as existing antioxidants in milk complement that of dark chocolate. Therefore, combining dark chocolate with milk and consuming it in modest quantities may increase antioxidants uptake.

Group F: Experimental Nutrition

F01 Update on the involvement of ACE2 in the intestinal transport of amino acids: Implication in nutrition and health

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Angiotensin Converting Enzyme 2 (ACE2) has been identified as the cellular binding site for the novel severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), the causative agent of COVID-19. Absorption of neutral amino acids across the intestinal cells is mediated by the broad neutral amino acid transporter B^0AT1. Intestinal expression of B^0AT1 depends on the co-expression of the membrane-anchored peptidase ACE2 which binds to the B^0AT1 amino acid transporter or the sodium-dependent imino-acid Transporter 1 (SIT1) in the enterocytes of both human being and experimental animals. Objective of this study is to provide an overview of the involvement of ACE2 in the transport of amino acids through the intestinal absorptive cells and possible harmful effects on nutrition and health due to altered ACE2 expression. Pubmed and google scholar were searched using the key words ACE2 paired with intestinal B^0AT1, SIT1, amino acid transport, health, nutrition. Expression of B^0AT1 in the intestine was completely absent in ACE2 knockout mice. Lack of ACE2 and the concurrent absence of B^0AT1 expression in small intestine lead to reduced weight gain, low plasma and muscle levels of glycine and L-tryptophan, niacin deficiency, decreased intestinal antimicrobial peptide production and increased susceptibility to inflammatory bowel disease in animal model. Lack of amino acid absorption lead to protein malnutrition, lack of energy, less synthesis of neurotransmitter serotonin which has the potential to affect the neurological well-being of the affected individual. Abundant expression of ACE2 in the small intestine and its association with amino acid transporters play crucial role in the absorption of amino acids, maintenance of structural and functional gut integrity and overall health and nutrition status of an individual.

F02 Inhibition of cholinesterases by water-soluble palm fruit extract

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Cholinesterase (ChE) inhibitors are used for the symptomatic treatment of Alzheimer's disease and other dementia. They are also used to counteract other neurological pathologies, such as myasthenia gravis, as well as for analgesic or postanaesthetic applications. There is interest in developing new ChE inhibitors from natural plant compounds, especially to identify lead compounds from extracts or to administer these as nutraceuticals or cheaper drug alternatives. Water-Soluble Palm Fruit Extract (WSPFE) recovered from the aqueous oil palm vegetation liquor is rich in phenolic acids and has potential neuroprotective effects. Here, we investigated the effects of WSPFE samples on acetylcholinesterase (AChE) and butyrylcholinesterase (BChE). WSPFE ethyl acetate fraction (EAF) inhibited these enzymes the most (AChE IC_{50}: 0.218 ± 0.029 μg mL^{-1}; BChE IC_{50}: 222.860±5.777 μg mL^{-1}) and had the highest AChE selectivity index (SI) value (1022.294) compared to whole samples and seven individual fractions, but these effects were weaker than those of the AChE selective agent donepezil hydrochloride (DH) (AChE IC_{50}: 0.013±0.001 μg mL^{-1}; BChE IC_{50}: 19.820±1.415 μg mL^{-1}; AChE SI: 1524.615). Fractions containing *p*-hydroxybenzoic acid and protocatechuic acid had the lowest AChE SI values (7.584 and 9.367 respectively) and may thus function as dual ChE inhibitors. Binary mixtures of DH and WSPFE EAF might have more potent inhibitory effects against these enzymes, as well as higher BChE/AChE selectivity. Further studies, especially *in vivo* ones, to further confirm the *in vitro* results obtained in the present study are warranted.

F03 Safety assessment of a novel plant-based milk alternative from kenaf (*Hibiscus cannabinus* L.) seeds through subacute oral toxicity study

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Kenaf (*Hibiscus cannabinus* L.) is a fiber crop in the Malvaceae family. From its seeds, a novel non-dairy beverage namely kenaf seed milk (KSM) can be produced when soaked seeds are ground with water. For safe human consumption especially in the long-term, safety evaluation of KSM is essential. Previous acute (14-day) oral toxicity study showed that single consumption of KSM at dose 9.2 ml/kg of body weight resulted in no major toxic effects in male Sprague-Dawley rats. In the present study, subacute (28-day) oral toxicity effects of KSM were investigated using the same animal model. KSM was administered at doses 3.1 ml/kg of body weight (low), 6.1 ml/kg of body weight (medium) and 9.2 ml/kg of body weight (high) to different animal groups for consecutive 28 days. At the end of the study, KSM did not cause any toxicity signs or mortality. Rats presented normal

behavior, physical appearance, physiological state, feed and water intakes, and growth pattern. Relative weights of vital organs were not significantly (p>0.05) affected. Gross examination also showed no obvious abnormalities. Hematological parameters such as red and white blood cell counts and hemoglobin concentration were not significantly (p>0.05) influenced by KSM at all three doses. Serum biochemical analysis revealed a significant (p<0.05) reduction in alanine transaminase (ALT) level in medium dose group. Additionally, low density lipoprotein cholesterol (LDL-C) and total cholesterol (TC) significantly (p<0.05) increased in low and high dose groups, respectively. However, the values are still within the normal ranges. Despite such observations, KSM at all doses have equivalent effects on high density lipoprotein cholesterol (HDL-C) and triglycerides (TG) with control and soybean milk (SM) groups. Therefore, there is the potential of developing KSM as a plant-based milk alternative. Further chronic toxicity and human studies are recommended.

F04 *In vitro* evaluation of the antibacterial activity of red beet peels and date pits on selected bacterial strains

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The exposure of plants to bacterial infection drives them to synthesize a wide range of bioactive compounds as part of their defencing mechanism. The application of these compounds to combat microbial contamination and antibiotic resistance in the food industry is a promising strategy. Red beet peels (RBP) and date pits (DP) are plants byproducts rich in essential phytochemicals. In this study, they were evaluated for their antibacterial activity. By using the sonication bath, different solvent extractions were applied. RBP was extracted with 50% aqueous ethanol + 0.5% acetic acid, and 50% aqueous methanol + 0.1% formic acid. Whereas DP was extracted by 50% aqueous ethanol, methanol, and ethanol. The resultant extracts were administered separately and as an antibiotic synergize (gentamicin) on *Salmonella typhimorium*, *Escherichia coli*, *Pseudomonas aeruginosa*, and *Staphylococcus aureus* using the agar disc diffusion method. There was a significant difference (p<0.05) among certain solvent extractions for both plant samples; however, it was inconsistent with all bacterial strains. Generally, levels of susceptibility of the plant extract ranged from weak to moderate due to several possible factors. RBP is suggested to have synergistic activity when combined with the aminoglycoside class of antibiotics compared to the application of the antibiotic only. Aminoglycosides function by inhibiting protein synthesis. Whereas RBP phytochemical's role is suggested to increase cell wall permeability, thus reducing higher antibiotic concentrations. DP is suggested for having antagonistic activity with *Escherichia coli, Salmonella tyhpimurium, and Pseudomonas aeruginosa*. Antagonism could occur when bacteriostatic agents reach the infection site before bactericidal agents. Another possible factor is the interaction of extracts and antibiotic chemical compounds. In general, more comprehensive methodological approaches are needed in future work to drive an in-depth understanding of plants–antibiotics and plants-microbial mechanisms of action, especially using DP and RBP extracts.

F05 Acute and subchronic oral toxicity evaluation of oil palm puree in Sprague Dawley rats

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The present study is the first to execute a systematic investigation into the potential toxicity of palm puree before it can be integrated into functional food and nutraceutical formulations and validated for safety and efficacy in human clinical trials. The present acute and subchronic toxicity assessments may help clarify the animal exposure limits and safety thresholds for palm puree and predict the exposure levels that could possibly be harmful to humans. Palm puree is produced via blending various proportions of mesocarp fibre and crude palm oil. This novel product is currently being produced by the Malaysian Palm Oil Board (MPOB) and was patented by them as well (No. PI20083758). Palm puree is high in antioxidants like carotenoids, tocols (tocopherols and tocotrienols), phenolic acids, polyphenols, and flavonoids. These antioxidants extend shelf life by improving oxidative stability of palm oil and its products. Antioxidants also defend cells from free radicals. Here, the impact of concentrated palm puree on numerous biochemical, haematological, and histopathological parameters in rats were investigated in the aforementioned acute and subchronic toxicity assays. For the acute toxicity study, animals administered single palm-puree doses (2000 mg kg^{-1}) by gavage were observed daily for 14 d. For the subchronic toxicity study, the rats were administered 500, 1000, or 2000 mg kg^{-1} palm puree daily for 28 d. We evaluated body and organ weights; performed haematological, biochemical, and histopathological analyses of blood and organ samples during and after treatment; and calculated the oral no-observed-adverse-effect level (NOAEL). The toxicity studies showed no signs of toxicity or mortality. The haematological, biochemical, and histopathological analyses and body and organ weights indicated no evidence of substantial toxicity at any dose of palm puree. The oral lethal dose and NOAEL for the palm puree were greater than 2000 mg kg^{-1} d^{-1} over 28 d.

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