

Table S1: Allocation criteria for minimum and maximum scores of servings as per nutrient density for MHEI₂₀₁₀ and MHEI₂₀₂₀

Dietary Components according to HEI-2015	Range of Scores	Criteria for Minimum Score		Criteria for Maximum Score	
		MHEI-2010	MHEI-2020	MHEI-2010	MHEI-2020
Adequacy					
Total Fruit	0-5	No Total Fruit		≥ 1.1 ser.	
Whole Fruit	0-5	No Whole Fruit		≥ 1.1 ser.	
Non-Starchy Vegetables	0-5	No Non-Starchy Vegetables		≥ 1.7 ser.	
Bean and Legumes ^a	0-5	No Bean and Legumes		≥ 0.6 ser.	≥ 0.6 ser.
Whole Grain	0-10	No Whole Grain		≥ 1.4 ser.	≥ 1.1 ser.
Dairy ^b	0-10	No Dairy		≥ 1.1 ser.	≥ 1.1 ser.
Total Protein Food ^c	0-5	No Total Protein Food		≥ 1.7 ser.	
Seafood	0-5	No Seafood		≥ 0.6 ser.	
Fatty Acids Ratio (PUFAs + MUFAs / SFAs)	0-10	≤ 1 ^d		≥ 2 ^e	
Moderation [†]					
Refined Grain	0-10	≥ 2.8 ser.	≥ 2.2 ser.	≤ 1.4 ser.	≤ 1.1 ser.
Sodium (mg/day)	0-10	≥ 4000 ^d		≤ 2300 ^e	
Saturated Fat (% of energy)	0-10	≥ 17 ^d		< 10 ^e	
Added Sugar (% of energy)	0-10	≥ 15 ^f		< 10 ^g	

Abbreviation: %, percent; kcal, kilocalories; mg, milligrams; MHEI, Malaysian Healthy Eating Index; MUFA, monounsaturated fatty acids; PUFA, polyunsaturated fatty acids; SFA, saturated fatty acids; ser., serving.

Note: ^a Protein content per animal protein serving =14gm/serving for both Malaysian Dietary Guidelines (MDGs) but differs for *beans and legumes* (MDG-2010= 7gms vs MDG-2020=14 gms); ^b MHEI₂₀₁₀ score for *dairy* was calculated based on 7g protein per serving while MHEI₂₀₂₀ score for *dairy* was calculated based on 8g protein per serving; ^c The *Total protein* component includes meat, poultry, seafood, eggs, beans and legumes; MHEI₂₀₁₀ score for *Total protein* was calculated based on 7gm of protein per serving of legume, MHEI₂₀₂₀ score for *Total protein* was calculated based on 14 gm of protein per serving of legume; ^d Guenther et al. (2008); ^e The Malaysian Reference Nutrient Intake 2017; ^f Dietary Guidelines for Americans, 2020–2025; ^g World Health Organization 2015; [†]High intake in moderation components denotes lower scores and *vice versa*.

Table S2: Derivation of Serving Size

Food Groups	Kcal	MDG 2010				MDG 2020			
		1500	1800	2000	2500	1500	1800	2000	2500
Total Grain	<i>Serving</i>	4	5	6	8	3	4	5	6
	Per 1000 Kcal	2.7	2.8	3.0	3.2	2.0	2.2	2.5	2.4
Refined Grain	<i>Serving</i>	2	2.5	3	4	1.5	2	2.5	3
	Per 1000 Kcal	1.3	1.4	1.5	1.6	1.0	1.1	1.3	1.2
Whole Grain	<i>Serving</i>	1	1	2	4	1.5	2	2.5	3
	Per 1000 Kcal	1.3	1.4	1.5	1.6	1.0	1.1	1.3	1.2
Whole Fruit	<i>Serving</i>	2	2	2	2	2	2	2	2
	Per 1000 Kcal	1.3	1.1	1.0	0.8	1.3	1.1	1.0	0.8
Total Fruit	<i>Serving</i>	2	2	2	2	2	2	2	2
	Per 1000 Kcal	1.3	1.1	1.0	0.8	1.3	1.1	1.0	0.8
Total Vegetables	<i>Serving</i>	3	3	3	3	3	3	3	3
	Per 1000 Kcal	2.0	1.7	1.5	1.2	2.0	1.7	1.5	1.2
Total Protein	<i>Serving</i>	2	3	3	4	3	3	4	4
	Per 1000 Kcal	1.3	1.7	1.5	1.6	2.0	1.7	2.0	1.6
Legume	<i>Serving</i>	0.5	1	1	1	1	1	1	1
	Per 1000 Kcal	0.3	0.5	0.5	0.4	0.5	0.5	0.5	0.5
Dairy	<i>Serving</i>	1	2	2	3	2	2	2	2
	Per 1000 Kcal	0.7	1.1	1.0	1.2	1.0	1.0	1.0	1.0
Fish	<i>Serving</i>	1	1	1	1	1	1	1	1
	Per 1000 Kcal	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5

Abbreviations Kcal Kilocalories MDG Malaysian Dietary Guidelines

Table S3 : Associations of MHEI metrics as per MDG year with cardiometabolic risk parameters

Components	BMI	WC	Body Fat %	TC	LDL-C	HDL-C	TG	TC:HDL-C	FPG	Insulin	HOMA2-IR	hsCRP	SBP	DBP	largeLDL	smallLDL
Adequacy																
Total fruit	-0.10	-0.08	-0.12	-0.05	-0.06	0.08	-0.06	-0.10	-0.02	-0.11	-0.09	-0.08	-0.03	-0.01	0.01	-0.07
Whole fruit	-0.11	-0.09	-0.13	-0.05	-0.06	0.08	-0.07	-0.11	-0.01	-0.11	-0.09	-0.09	-0.04	-0.02	0.00	-0.07
Non starchy vegetables	-0.07	0.00	-0.07	-0.09	-0.12	0.09	-0.03	-0.13	0.04	-0.01	0.01	-0.03	-0.04	0.00	0.02	-0.10
Beans and legumes																
2010	-0.09	-0.01	0.05	-0.10	-0.06	-0.06	-0.07	-0.01	0.09	-0.02	0.00	0.03	-0.04	0.01	-0.10	0.00
2020	-0.08	0.02	0.05	-0.11	-0.07	-0.06	-0.06	0.00	0.08	-0.04	-0.02	0.01	-0.01	0.05	-0.11	0.00
Whole Grain																
2010	-0.11	-0.05	-0.04	-0.11	-0.13	0.04	-0.01	-0.07	-0.04	-0.06	-0.07	-0.09	-0.03	0.01	-0.12	-0.04
2020	-0.11	-0.05	-0.03	-0.11	-0.13	0.05	-0.01	-0.07	-0.03	-0.06	-0.07	-0.09	-0.04	0.00	-0.12	-0.05
Dairy																
2010	-0.09	-0.07	0.00	-0.02	-0.03	0.05	-0.02	-0.06	0.02	-0.05	-0.05	-0.01	0.01	0.00	-0.06	-0.03
2020	-0.09	-0.07	0.00	-0.02	-0.03	0.05	-0.02	-0.05	0.03	-0.05	-0.05	-0.01	0.01	0.00	-0.06	-0.04
Total Protein Food																
2010	0.02	-0.04	-0.01	0.04	0.03	0.01	0.02	0.04	0.06	0.06	0.07	0.00	0.03	0.02	0.13	0.03
2020	0.04	-0.07	-0.05	0.10	0.07	0.06	0.01	0.01	0.02	0.06	0.05	-0.02	0.02	0.00	0.18	0.02
Seafood	0.11	0.04	-0.02	0.16	0.16	0.00	0.03	0.08	-0.03	0.10	0.07	0.02	-0.01	-0.06	0.12	0.08
Fatty Acid Ratio	-0.14	-0.13	-0.11	-0.02	-0.06	0.12	-0.09	-0.12	-0.01	-0.12	-0.12	-0.04	-0.07	-0.07	0.08	-0.10
Moderation																
Refined Grain †																
2010	-0.10	-0.09	-0.08	0.03	-0.03	0.18	-0.07	-0.10	0.00	-0.04	-0.05	-0.10	-0.05	-0.05	0.05	-0.11
2020	-0.14	-0.13	-0.14	0.01	-0.03	0.15	-0.11	-0.12	-0.02	-0.07	-0.08	-0.10	-0.06	-0.06	0.06	-0.13
Sodium †	0.16	0.14	0.12	0.11	0.15	-0.05	-0.03	0.06	-0.03	0.08	0.06	0.04	0.04	0.04	0.04	0.01
Saturated Fats †	-0.05	-0.03	-0.04	-0.08	-0.07	-0.04	0.04	-0.01	-0.10	-0.08	-0.11	0.01	0.04	0.03	-0.07	0.01
Added Sugar †	-0.06	-0.11	-0.06	-0.08	-0.06	0.02	-0.09	-0.05	0.06	0.00	0.01	-0.10	-0.04	-0.05	0.03	-0.04
Total Score																
2010	-0.13	-0.11	-0.08	-0.06	-0.08	0.10	-0.11	-0.12	0.01	-0.09	-0.09	-0.09	-0.06	-0.05	0.00	-0.09
2020	-0.13	-0.12	-0.10	-0.06	-0.08	0.10	-0.12	-0.12	0.00	-0.10	-0.11	-0.09	-0.06	-0.05	0.00	-0.10

Abbreviations: BMI, body mass index; DBP, diastolic blood pressure; FPG, fasting plasma glucose; HDL-C, high-density lipoprotein cholesterol; HOMA2-IR, homeostatic model assessment of insulin resistance; hs-CRP, high-sensitivity C-reactive protein; LDL-C, low-density lipoprotein cholesterol; *small* LDL, *small* low-density lipoprotein particles; *large* LDL, *large* low-density lipoprotein particles; SBP, systolic blood pressure; TC, total cholesterol; TC:HDL-C, total cholesterol : high-density lipoprotein cholesterol ratio; TG, triglycerides; WC, waist circumference

Statistical data presented in correlation coefficients. Partial correlation using Spearman's rho adjusted for age and gender. Significant values are highlighted in bold.

† Component that is recommended to be consumed in moderation. Therefore higher intakes relate to lower scores and lower intakes relate to higher scores.

Table S4 Comparison of Cardiometabolic Risk Parameters between Palm Oil and Non-Palm Oil Users (n=577)

Parameters	Palm Oil Users (<i>n</i> =484)	Non-Palm Oil User (<i>n</i> =93)	<i>P value</i>
Body Weight (kg)	64.5 ± 0.7	65.3 ± 1.4	0.622
BMI (kg/m ²)	24.9 ± 0.2	25.4 ± 0.5	0.327
WC (cm)	84.0 ± 0.6	85.4 ± 1.3	0.340
TC (mmol/L)	5.10 ± 0.04	5.22 ± 0.09	0.246
LDL-C (mmol/L)	3.09 ± 0.04	3.22 ± 0.08	0.163
HDL-C (mmol/L)	1.49 ± 0.02	1.45 ± 0.04	0.488
TG (mmol/L)	1.17 ± 0.03	1.20 ± 0.05	0.647
TC:HDL-C	3.70 ± 0.05	3.83 ± 0.11	0.331
FPG (mmol/L)	5.19 ± 0.05	5.34 ± 0.10	0.198
Insulin (umol/ml)	6.31 ± 0.22	6.43 ± 0.50	0.824
HOMA2-IR	1.51 ± 0.06	1.60 ± 0.15	0.592
hsCRP (mg/L)	3.02 ± 0.22	3.01 ± 0.41	0.983
SBP (mmHg)	123 ± 1	125 ± 2	0.216
DBP (mmHg)	75 ± 0	77 ± 1	0.196
<i>large</i> LDL (nmol/L)	466.1 ± 9.7	458.1 ± 21.6	0.737
<i>small</i> LDL (nmol/L)	477.4 ± 14.7	517.0 ± 34.0	0.281

Abbreviations: BMI, body mass index; DBP, diastolic blood pressure; FPG, fasting plasma glucose; HDL, high-density lipoprotein cholesterol; HOMA2-IR, homeostatic model assessment of insulin resistance; hs-CRP, high-sensitivity C-reactive protein; LDL-C, low-density lipoprotein cholesterol; *small* LDL, *small* low-density lipoprotein particles; *large* LDL, *large* low-density lipoprotein particles; SBP, systolic blood pressure; TC, total cholesterol; TC:HDL-C, total cholesterol : high-density lipoprotein cholesterol ratio; TG, triglycerides; WC, waist circumference

Data analysed using Independent *t*-test and presented as mean ± SEM

Table S5: Association of *Added Sugar* scores with cardiometabolic risk parameters as per MDG-2020 and WHO 2015 cut-off limits.

Added sugar scores	BMI	WC	Body Fat	TC	LDL	HDL	TG	TC:HDL	FPG	Insulin	HOMA 2IR	hsCRP	BP systolic	BP diastolic	Large LDL	Small LDL
MDG-2020 (3 to 6 servings)	-0.01	-0.07	-0.05	-0.08	-0.06	-0.01	-0.06	-0.03	0.06	0.02	0.02	-0.07	0.01	0.00	0.05	-0.03
WHO 2015 (>10 % of energy)	-0.06	-0.11	-0.06	-0.08	-0.06	0.02	-0.09	-0.05	0.06	0.00	0.01	-0.10	-0.04	-0.05	0.03	-0.04

Abbreviations: BMI, body mass index; DBP, diastolic blood pressure; FPG, fasting plasma glucose; HDL, high density lipoprotein; HOMA2-IR, homeostatic model assessment of insulin resistance; hs-CRP, high-sensitivity C-reactive protein; LDL-C, low density lipoprotein; *small* LDL, *small* low density lipoprotein particles; *large* LDL, *large* low density lipoprotein particles; MDG, Malaysian Dietary Guidelines; SBP, systolic blood pressure; TC, total cholesterol; TC:HDL-C, total cholesterol : high density lipoprotein ratio; TG, triglycerides; WC, waist circumference; WHO, World Health Organisation.

Statistical data presented in correlation coefficients. Partial correlation using Spearman's rho adjusted for age and gender. Significant values are highlighted in bold.

Note: Higher scores for *added sugar* indicated lower intakes and *vice-versa*.