

Supplementary materials

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Table S1. Fatty acid compositions of soybean oil, olive oil, and camellia seed oil used in the present trial

Fatty acid	Percentage (%) of total fatty acids, mean \pm SD		
	Camellia seed oil	Olive oil	Soybean oil
C16:0	8.76 \pm 0.05	12.87 \pm 0.04	10.93 \pm 0.06
C16:1	/	1.14 \pm 0.04	/
C18:0	0.93 \pm 0.48	1.04 \pm 0.17	3.57 \pm 0.16
C18:1 n-9	79.45 \pm 0.33	74.52 \pm 0.12	22.36 \pm 0.00
C18:2 n-6	9.9 \pm 0.04	8.91 \pm 0.00	56.1 \pm 0.33
C18:3 n-3	0.34 \pm 0.05	0.68 \pm 0.04	7.03 \pm 0.10
C20:0	/	0.27 \pm 0.02	/
C20:1 n-9	0.62 \pm 0.08	0.22 \pm 0.01	/
SFA	9.86 \pm 0.43	14.53 \pm 0.15	14.59 \pm 0.23
MUFA	79.94 \pm 0.34	75.43 \pm 0.26	22.36 \pm 0.00
PUFA	10.21 \pm 0.09	10.04 \pm 0.33	63.05 \pm 0.23

Fatty acid compositions of the three oils were determined by gas chromatography. Abbreviations: SD, standard deviation; SFA, saturated fatty acid; MUFA, monounsaturated fatty acid; PUFA, polyunsaturated fatty acid.

Table S2. Protocol for the recruitment, informed consent, population screening, randomization, intervention and follow-up racking.

Recruitment and informed consent

- Recruitment mainly conducted offline and online
- Stimulating the enthusiasm and participation of potential participants
- Informed consent for screening period ^a

Participants screening round 1

- Conformity of participants' clinical and anthropometric parameters
- Medical history questionnaire
- Eating habits questionnaire (including allergen record)

Participants screening round 2

- Eligibility testing (12-hour fasting blood sample were used)

Randomization

- Randomly assigned to one of the three diets using different cooking oils

Dietary Intervention

- Intervention last for 3 months
- Lunch and dinner provided
- Recording the typical breakfast (requiring to avoid vegetable oil intake) ^b

Follow-up racking

- Daily diet records
 - Self-reported compliance
 - Adherence assessment ^c
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^a All potential participants were required to sign the informed consent before screening round 1.

^b The present trial only provided lunch and dinner, participants were required to record their breakfast and avoid intake of vegetable oil in breakfast.

^c Adherence to the intervention were assessed by scores of daily diet records (account 60% for adherence assessment) and self-reported compliance (account 40% for adherence assessment). Daily diet records included the number of uneaten meals and the quantity of uneaten food observed directly by the food supply personnel. Self-reported compliance was based on their performance in what required (snacks and extra meals are discouraged, food containing vegetable oils is especially restricted).

Table S3. Nutrient targets of the present feeding trial

Items	Targets
Carbohydrate, % of total energy	45%-65%
Fat, % of total energy	20%-35%
Protein, % of total energy	10%-35%
Total energy	2100-2300 kcal

Table S4. One-day sample menu for participants

Meals	Food item	g	
Breakfast ^a	Egg	40	
	Rice porridge		
	Rice	300	
	Fermented bean curd	40	
	Steamed stuffed bun		
	Flour	100	
	Pork	35	
	Ginger	3	
Lunch ^b	Rice	200	
	Dish A		
	Fish	130	
	Spring onion	3	
	Dish B		
	Tomato	200	
	Egg	80	
	Spring onion	3	
	Dish C		
	Tofu	200	
	Cooking oil	15	
	Salt	2	
	Dinner ^b	Rice	200
		Dish A	
Potato		170	
Green pepper		30	
Dish B			
Broccoli		200	
Garlic		5	
Dish C			
Chicken leg		130	
Cooking oil		15	
Salt		2	
Energy			
Breakfast		527 kcal	
Lunch and dinner		1626 kcal	
Total		2153 kcal	

^a Breakfast was not provided during the intervention, but all participants were asked to strictly avoid the intake of vegetable oil fats. According to the survey of daily eating habits, a typical menu breakfast was displayed.

^b The menus of lunch and dinner were the same across the three intervention groups, except for the different cooking oils (soybean oil, olive oil, and camellia seed oil) used.

Table S5. Compliance score of participants among groups

Compliance score	Mean \pm SD				<i>P</i> -value ^a
	All	SO group	OO group	CSO group	
Self-assessment ^b	6.98 \pm 1.10	7.07 \pm 1.16	6.88 \pm 1.20	6.97 \pm 0.98	0.82
Staff-assessment ^c	9.77 \pm 0.45	9.66 \pm 0.55	9.79 \pm 0.41	9.88 \pm 0.33	0.18
Total ^d	8.65 \pm 1.10	8.62 \pm 0.64	8.68 \pm 0.51	8.66 \pm 0.53	0.92

^a Group differences in scores were investigated by one-way ANOVA.

^b The participants were scoring themselves (scale of 1 to 10) based on their performance on required items (snacks and extra meals were discouraged, extra direct intake of vegetable oils was especially restricted).

^c The staff-assessment score was assessed by follow-up research personnel and was the sum of the staff-assessment I score and staff-assessment II score. Participants scores 1 to 5 for the staff-assessment I score when the number of uneaten meals account for less than 10%, 9.25%, 7.5%, 6.25%, and 5% of total meals, respectively. Participants scores 1 to 5 for the staff-assessment II score when the remaining quantity of each meal account for less than 30%, 25%, 20%, 15%, and 10% of total quantity for each meal, respectively.

^d The total compliance score was calculated by formula: self-assessment score * 0.4 + staff assessment score * 0.6.

Abbreviation: SO, soybean oil; OO, olive oil; CSO, camellia seed oil.

Table S6. Mean changes (95% CIs) of primary and secondary outcomes during intervention

Outcomes (Changes from baseline)	SO group		OO group		CSO group		<i>P</i> value ^a	
	Medium-term	End	Medium-term	End	Medium-term	End	OO vs. SO	CSO vs. SO
Weight, kg	-0.11 (-0.58, 0.35)	-0.31 (-0.88, 0.27)	0.29 (-0.05, 0.63)	-0.13 (-0.62, 0.36)	-0.43 (-1.03, 0.16)	-0.72 (-1.38, -0.07)	0.50	0.17
Waist circumference, cm	-1.50 (-3.76, 0.69)	0.88 (-2.41, 4.17)	-0.23 (-2.34, 1.88)	2.04 (0.11, 3.97) ^b	-3.40 (-5.53, -1.26)	0.67 (-1.35, 2.70)	0.68	0.92
Diastolic blood pressure, mmHg	-2.34 (-5.96, 1.27)	-3.69 (-6.83, -0.55) ^b	2.11 (-0.21, 4.42)	-1.04 (-4.91, 2.83)	-0.69 (-2.64, 1.26)	-0.93 (-4.00, 2.14)	0.10	0.38
Systolic blood pressure, mmHg	0.28 (-4.99, 5.54)	-2.34 (-5.70, 1.01)	2.39 (-2.98, 7.77)	1.40 (-2.48, 5.28)	2.45 (-0.89, 5.78)	0.34 (-3.93, 4.62)	0.53	0.52
Triglycerides, mmol/L	0.11 (-0.03, 0.25)	-0.01 (-0.19, 0.16)	0.26 (-0.04, 0.56)	0.04 (-0.18, 0.26)	0.13 (-0.06, 0.31)	0.02 (-0.14, 0.18)	0.38	0.62
Total cholesterol, mmol/L	-0.27 (-0.51, -0.04)	-0.20 (-0.49, 0.08)	-0.17 (-0.38, 0.04)	0.09 (-0.23, 0.42)	-0.13 (-0.35, 0.09)	-0.01 (-0.28, 0.25)	0.30	0.34
HDL-cholesterol, mmol/L	-0.14 (-0.21, -0.07) ^b	-0.11 (-0.19, -0.03) ^b	-0.03 (0.10, 0.03)	0.02 (-0.05, 0.08)	-0.10 (-0.17, -0.03) ^b	-0.10 (-0.18, -0.03) ^b	0.03	0.52
LDL-cholesterol, mmol/L	0.20 (0.04, 0.37) ^b	0.25 (0.02, 0.48) ^b	0.23 (0.06, 0.39) ^b	0.44 (0.16, 0.71) ^b	0.33 (0.16, 0.50) ^b	0.41 (0.22, 0.60) ^b	0.46	0.36
Apolipoprotein A1, g/L	-0.09 (-0.16, -0.03) ^b	0.12 (0.00, 0.25) ^b	0.03 (-0.04, 0.09)	0.28 (0.13, 0.43) ^b	-0.05 (-0.11, 0.01)	0.07 (-0.01, 0.16)	0.11	0.89
Apolipoprotein B, g/L	-0.02 (-0.06, 0.03)	0.01 (-0.04, 0.07)	-0.03 (-0.08, 0.02)	0.05 (-0.02, 0.11)	-0.01 (-0.07, 0.04)	0.03 (-0.02, 0.08)	0.87	0.82
Lipoprotein (a), mg/L	-9.7 (-27.5, 8.2)	41.7 (17.6, 65.7) ^b	-12.3 (-27.6, 2.9)	31.3 (5.7, 56.9) ^b	-9.3 (-21.4, 2.8)	37.9 (14.1, 60.6) ^b	0.81	0.66
Alanine transaminase, U/L	-2.17 (-4.24, -0.11) ^b	-0.24 (-4.71, 4.22)	-0.46 (-4.27, 3.34)	-1.44 (-4.04, 1.16)	-2.86 (-7.81, 2.08)	-4.59 (-9.84, 0.67)	0.99	0.19
Aspartate aminotransferase, U/L	-0.10 (-1.12, 0.91)	1.79 (-0.86, 4.45)	-1.03 (-3.95, 1.88)	-0.72 (-2.25, 0.81)	-2.24 (-4.95, 0.47)	-1.72 (-4.73, 1.28)	0.27	0.02
Lactate dehydrogenase, U/L	-10.7 (-16.3, -5.1) ^b	-4.7 (-11.4, 1.9)	-15.6 (-21.3, -10.0) ^b	-3.3 (-12.0, 5.3)	-8.7 (-14.8, -2.5)	-2.1 (-20.0, 15.8)	0.40	0.63
Creatine kinase, U/L	-14.8 (-31.1, 1.6)	-19.7 (-36.3, -3.0) ^b	-37.9 (-75.8, 0.2)	-21.9 (-37.4, -6.4) ^b	-9.5 (-35.2, 16.3)	-26.2 (-47.9, -4.6) ^b	0.39	0.82
Creatine kinase MB, U/L	0.68 (-0.82, 2.17)	-1.03 (-2.30, 0.23)	5.0 (-6.3, 16.3)	1.59 (-3.32, 6.50)	0.10 (-0.97, 1.16)	0.33 (-2.06, 2.72)	0.46	0.76
Tumor necrosis factor- α , pg/mL	-1.53 (-2.42, -0.65) ^b	-1.26 (-2.07, -0.46) ^b	-1.34 (-1.92, -0.76) ^b	-1.26 (-2.20, -0.32) ^b	-1.79 (-2.65, -0.92) ^b	-1.34 (-2.18, -0.51) ^b	0.89	0.65

Interleukin-6, pg/mL	0.87 (0.19, 1.55) ^b	0.14 (-0.27, 0.54)	1.07 (0.54, 1.60) ^b	0.64 (0.20, 1.08) ^b	0.27 (-1.10, 1.64)	-0.13 (-0.76, 0.49)	0.65	0.21
Interleukin-8, pg/mL	-67.2 (-115.5, -18.9) ^b	-71.2 (-118.8, -23.5) ^b	-49.1 (-71.3, -26.9) ^b	-49.6 (-74.6, -24.7) ^b	-57.6 (-94.4, -20.8) ^b	-54.3 (-89.3, -19.3) ^b	0.40	0.62
Hypersensitive C-reactive protein, mg/L	-0.05 (-1.36, 1.27)	-0.01 (-0.70, 0.67)	0.37 (-0.36, 1.11)	0.30 (-0.49, 1.09)	-0.02 (-0.36, 0.32)	-0.01 (-0.39, 0.37)	0.38	0.78
Myoglobin, ng/mL	-0.68 (-4.14, 2.77)	0.45 (-2.81, 3.72)	-1.24 (-3.95, 1.47)	-0.15 (-3.26, 2.96)	-1.11 (-5.95, 3.73)	-0.06 (-3.99, 3.87)	0.95	0.70
Homocysteine, umol/L	-1.32 (-1.78, -0.86) ^b	-0.86 (-1.62, -0.09) ^b	-1.33 (-2.17, -0.49) ^b	0.24 (-1.89, 2.37)	-1.62 (-2.91, -0.32) ^b	-0.54 (-1.74, 0.66)	0.56	0.93
N-terminal pro-brain natriuretic peptide, pg/mL	6.3 (-5.0, 17.5)	5.4 (-7.0, 17.9)	-2.8 (-19.1, 13.5)	-8.4 (-22.0, 5.2)	11.2 (-0.6, 22.9)	1.4 (-8.2, 11.1)	0.12	0.80
Hypersensitive troponin I, pg/mL	-1.25 (-1.53, -0.97) ^b	-0.15 (-0.45, 0.15)	-1.12 (-1.66, -0.58) ^b	0.16 (-0.70, 1.02)	-1.36 (-1.78, -0.94) ^b	0.2 (-1.0, 1.4)	0.68	0.68
High-sensitivity troponin T, pg*10 ⁻³ /mL	1.51 (1.17, 1.87) ^b	1.10 (0.73, 1.48) ^b	1.34 (0.95, 1.72) ^b	1.12 (0.63, 1.61) ^b	1.29 (0.87, 1.72) ^b	0.97 (0.57, 1.37) ^b	0.38	0.20

^a Linear mixed models with adjusting for age and communities of participants were using to examine group differences in changes of outcomes.

^b Indicates a *P* value < 0.05 by paired t-test for the changes of outcomes between timepoints within groups.

Abbreviation: SO, soybean oil; OO, olive oil; CSO, camellia seed oil.