

**Supplementary Table S1.** Characteristics of the female participants including anthropometric measures, CVD risk markers and habitual dietary intakes according to *APOE* genotype<sup>1</sup>

	<i>APOE</i> genotype groups				<i>P</i>		
	All (n=190)	<i>E2</i> carriers (n=28)	<i>E3/E3</i> (n=121)	<i>E4</i> carriers (n=38)	Genotype <sup>2</sup>	BMI <sup>2</sup>	Genotype x BMI <sup>3</sup>
Frequency (%)	-	14.7%	63.7%	20%			
Age (y)	42±1	45±3	41±2	40±3	0.41		
BMI (kg/m <sup>2</sup> )	23.5±0.3	22.5±0.7	23.6±0.4	23.8±0.6	0.31		
<b>Anthropometric and body composition measurements</b>							
WC (cm)	79.2±0.8	77.9±2.0	79.6±1.0	79.2±1.7	0.76	<0.01	0.09
HC (cm)	101±1	98.0±1.8	100±1	102±2	0.15	<0.01	0.38
Body fat (%)	32.2±0.5	30.9±1.4	32.6±0.7	32.2±1.2	0.53	<0.01	0.62
Fat mass (kg)	21.1±0.6	18.9±1.5	21.5±0.7	21.8±1.3	0.27	<0.01	0.39
Lean mass (kg)	40.6±0.4	39.5±1.1	40.6±0.5	41.7±0.9	0.30	0.27	0.75
Abdominal VAT (g)	339±25	237±61	375±29	309±52	0.10	<0.01	0.44
Android fat mass (kg)	1.47±0.07	1.21±0.19	1.55±0.09	1.46±0.16	0.27	<0.01	<0.01
Android lean mass (kg)	2.80±0.03	2.72±0.09	2.79±0.04	2.90±0.07	0.26	0.48	0.76
Android fat (%)	31.7±0.9	29.8±2.2	32.3±1.0	31.5±1.9	0.56	<0.01	0.76
Gynoid fat (%)	38.5±0.5	37.1±1.3	38.9±0.6	38.8±1.2	0.49	<0.01	0.59
A/G fat % ratio	0.80±0.01	0.79±0.04	0.81±0.02	0.78±0.03	0.77	0.02	0.66
<b>Cardiovascular disease risk markers</b>							
Blood pressure (mmHg)							
Systolic	117±1	113±3	118±1	118±2	0.27	0.15	0.01
Diastolic	70±1	68±2	71±1	71±2	0.24	0.56	0.83
Pulse pressure	47±1	46±2	47±1	47±2	0.73	0.22	0.01
TC (mmol/l)	5.19±0.07	4.86±0.16	5.28±0.08	5.18±0.14	0.06	0.23	0.87
TAG (mmol/l)	0.90±0.03	0.84±0.08	0.91±0.04	0.90±0.07	0.76	<0.01	0.26
HDL-C (mmol/l)	1.78±0.03	1.91±0.06	1.78±0.03	1.69±0.05	0.04	0.80	0.99
LDL-C (mmol/l)	2.99±0.06	2.95±0.15 <sup>b</sup>	3.50±0.07 <sup>a</sup>	3.49±0.13 <sup>a</sup>	<0.01	0.06	0.49
Non-HDL-C (mmol/l)	3.42±0.07	3.09±0.13 <sup>b</sup>	3.56±0.06 <sup>a</sup>	3.64±0.10 <sup>a</sup>	<0.01	0.04	0.70
TC: HDL-C ratio	2.98±0.05	2.59±0.12	3.04±0.06	3.10±0.10	<0.01	0.06	0.89
LDL-C:HDL-C ratio	1.73±0.04	1.38±0.10 <sup>b</sup>	1.78±0.05 <sup>a</sup>	1.85±0.09 <sup>a</sup>	<0.01	0.15	0.82
NEFA(μmol/l)	462±13	462±35	479±17	404±30	0.09	0.86	0.87
Glucose (mmol/l)	4.93±0.03	4.97±0.08	4.94±0.04	4.92±0.07	0.88	0.68	0.67
CRP (mg/l)	1.46±0.20	1.02±0.54	1.58±0.26	1.49±0.46	0.65	1.00	1.00
Adiponectin(μg/ml)	7.80±0.42	5.90±1.05	8.04±0.51	7.98±0.90	0.18	0.34	0.29
Uric acid(μmol/l)	242±4	249±10	243±5	241±8	0.80	0.74	0.85
<b>Dietary intake</b>							
Energy intake (MJ)	7.5±0.1	6.9±0.4 <sup>a</sup>	7.5±0.2 <sup>ab</sup>	8.1±0.3 <sup>b</sup>	0.05	0.10	0.30
Total fat (%TE)	36.7±0.6	37.9±1.5	36.0±0.7	37.3±1.3	0.43	0.80	0.74
SFA (%TE)	12.9±0.3	12.7±0.7	12.8±0.4	13.0±0.6	0.95	0.63	0.64
MUFA (%TE)	13.9±0.3	14.5±0.7	13.6±0.4	14.2±0.6	0.44	0.45	0.39
PUFA (%TE)	6.3±0.1	6.8±0.4	6.1±0.2	6.7±0.3	0.09	0.73	0.23
Trans fat (%TE)	0.52±0.02	0.54±0.05	0.51±0.03	0.53±0.05	0.83	0.65	0.83
Total CHO (%TE)	45.6±0.7	41.3±1.9 <sup>a</sup>	47.2±0.9 <sup>b</sup>	44.4±1.6 <sup>ab</sup>	0.02	0.68	0.74
Total sugars (%TE)	19.4±0.5	18.0±1.2	19.4±0.6	20.3±1.0	0.33	0.71	0.64

Total fibre (AOAC, g)	23.7±0.7	22.1±1.7	23.4±0.8	26.0±1.5	0.18	0.85	0.60
Total protein (%TE)	18.5±0.4	21.9±1.0 <sup>b</sup>	17.9±0.5 <sup>a</sup>	18.1±0.9 <sup>a</sup>	<0.01	<0.01	<0.01

<sup>1</sup>Data was presented as estimated marginal means ± SE, p<0.05 is considered significant. E2 carriers= E2/E3, E4 carriers= E3/E4 and E4/E4.

<sup>2</sup>Data was analysed by univariate general linear model (ANCOVA) adjusted for age and sex.

<sup>3</sup>APOE genotype x BMI interaction by ANCOVA, adjusted for age and sex. Carrier code and BMI as fixed factors and variable of interest as dependent variable.

abc significant differences (P<0.05) shown as different superscript letters

Sample sizes are as follows: for NEFA all n=189 *APOE2* carriers n=28, *APOE3/E3* n=120, *APOE4* carriers n=38; for CRP all n=189, *APOE2* carriers n=28, *APOE3/E3* n=120, *APOE4* carriers n=38; for Adiponectin and Uric acid all n=189 *APOE2* carriers n=28, *APOE3/E3* n=120, *APOE4* carriers n=38, Dietary Intakes all n=185 *APOE2* carriers n=28, *APOE3/E3* n=117, *APOE4* carriers n=37.

Abbreviations: AOAC: Association of official analytical chemists, A/G fat % ratio android to gynoid fat % ratio, BMI body mass index, CHO carbohydrate, CRP C-reactive protein, HC hip circumference, HDL-C high-density lipoprotein cholesterol, LDL-C low-density lipoprotein cholesterol, MUFA monounsaturated fatty acids, NEFA non-esterified fatty acids, PUFA polyunsaturated fatty acids, SFA saturated fatty acids, TC total cholesterol, TAG triacylglycerol, VAT visceral adipose tissue, WC waist circumference.

**Supplementary Table S2.** Characteristics of the male participants including anthropometric measures, CVD risk markers and habitual dietary intakes according to *APOE* genotype<sup>1</sup>

	<i>APOE</i> genotype				<i>P</i>		
	All (n=170)	<i>E2</i> carriers (n=18)	<i>E3/E3</i> (n=107)	<i>E4</i> carriers (n=43)	Genotype <sup>2</sup>	BMI <sup>2</sup>	Genotype x BMI <sup>3</sup>
Frequency (%)	-	10.6%	62.9%	25.3%			
Age (y)	43±1	44±3 <sup>ab</sup>	41±1 <sup>a</sup>	48±2 <sup>b</sup>	0.04		
BMI (kg/m <sup>2</sup> )	24.9±0.2	25.2±0.8	25.0±0.3	24.7±0.5	0.88		
<b>Anthropometric and body composition measurements</b>							
WC (cm)	90.1±0.8	90.7±2.2	90.2±0.9	89.3±1.4	0.82	<0.01	0.20
HC (cm)	103±1	104±2	103±1	102±1	0.70	<0.01	0.97
Body fat (%)	23.8±0.6	25.5±1.6	23.8±0.7	23.0±1.1	0.42	<0.01	0.71
Fat mass (kg)	19.5±0.6	21.1±1.8	19.5±0.7	18.8±1.2	0.56	<0.01	0.82
Lean mass (kg)	57.3±0.6	57.7±1.7	57.0±0.7	58.1±1.1	0.66	0.14	0.30
Abdominal VAT (g)	889±51	977±137	912±56	808±90	0.50	<0.01	0.60
Android fat mass (kg)	1.76±0.08	1.96±0.23	1.78±0.09	1.65±0.15	0.49	<0.01	0.79
Android lean mass (kg)	3.90±0.04	3.89±0.12	3.86±0.05	4.03±0.08	0.20	0.16	0.33
Android fat (%)	29.2±0.9	32.0±2.7	30.0±1.1	27.2±1.8	0.29	<0.01	0.69
Gynoid fat (%)	24.9±0.5	26.5±1.6	24.8±0.7	24.6±1.1	0.60	0.02	0.62
A/G fat % ratio	1.14±0.02	1.20±0.06	0.15±0.02	1.07±0.04	0.10	0.06	0.82
<b>Cardiovascular disease risk markers</b>							
Blood pressure (mmHg)							
Systolic	124±1	124±3	124±2	123±2	0.71	0.02	<0.01
Diastolic	74±1	72±2 <sup>ab</sup>	75±1 <sup>a</sup>	71±1 <sup>b</sup>	<0.01	0.36	0.50
Pulse pressure	50±1	52±2	49±1	52±2	0.96	0.06	0.11
TC (mmol/l)	5.12±0.09	4.64±0.24	5.14±0.10	5.28±0.16	0.08	0.65	0.94
TAG (mmol/l)	1.07±0.04	1.25±0.12	1.01±0.05	1.11±0.08	0.13	0.02	0.01
HDL-C (mmol/l)	1.51±0.03	1.38±0.09	1.53±0.04	1.50±0.06	0.27	0.47	0.27
LDL-C (mmol/l)	3.13±0.08	2.70±0.21	3.16±0.09	3.28±0.14	0.07	0.74	0.99
Non-HDL-C (mmol/l)	3.62±0.08	3.27±0.22	3.62±0.09	3.78±0.15	0.17	0.70	0.97
TC: HDL-C ratio	3.54±0.08	3.55±0.24	3.52±0.10	3.63±0.16	0.84	0.70	0.97
LDL-C:HDL-C ratio	2.18±0.07	2.07±0.21	2.19±0.09	2.27±0.14	0.71	0.91	0.99
NEFA(μmol/l)	326±19	337±57 <sup>ab</sup>	285±23 <sup>a</sup>	424±37 <sup>b</sup>	<0.01	0.02	0.15
Glucose (mmol/l)	5.15±0.04	5.01±0.12	5.16±0.05	5.15±0.08	0.50	0.02	0.19
CRP (mg/l)	1.07±0.11	1.07±0.37	1.38±0.15	0.95±0.24	0.29	0.17	0.94
Adiponectin(μg/ml)	4.77±0.34	4.69±1.04	4.70±0.44	4.85±0.65	0.98	0.98	0.78
Uric acid(μmol/l)	322±5	339±15	320±6	321±9	0.47	0.87	0.52
<b>Dietary intake</b>							
Energy intake (MJ)	9.6±0.2	8.8±0.6	9.8±0.2	9.5±0.4	0.30	0.58	0.80
Total fat (%TE)	36.5±0.7	36.8±2.4	36.6±1.0	36.0±1.5	0.94	0.18	0.86
SFA (%TE)	13.1±0.4	14.3±1.3	13.3±0.5	12.2±0.8	0.33	0.67	0.93
MUFA (%TE)	13.6±0.3	13.1±1.0	13.6±0.4	13.5±0.7	0.90	0.06	0.15
PUFA (%TE)	6.2±0.2	5.4±0.6	6.1±0.2	6.9±0.4	0.07	0.31	0.43
Trans fat (%TE)	0.57±0.03	0.65±0.08	0.57±0.03	0.54±0.05	0.48	0.14	0.16
Total CHO (%TE)	45.4±1.0	44.7±3.0	45.7±1.2	45.1±1.9	0.93	0.42	0.90
Total sugars (%TE)	17.6±0.6	17.1±1.8	17.8±0.7	17.6±1.1	0.94	0.17	0.02
Total fibre (AOAC, g)	25.7±0.7	22.2±2.2	25.5±0.9	27.4±1.4	0.14	0.63	0.73

Total protein (%TE)	18.3±0.4	19.2±1.3	17.8±0.5	19.3±0.8	0.25	0.86	0.75
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<sup>1</sup>Data was presented as estimated marginal means ± SE, p<0.05 is considered significant. E2 carriers= E2/E3, E4 carriers= E3/E4 and E4/E4.

<sup>2</sup>Data was analysed by univariate general linear model (ANCOVA) adjusted for age and sex.

<sup>3</sup>APOE genotype x BMI interaction by ANCOVA, adjusted for age and sex. Carrier code and BMI as fixed factors and variable of interest as dependent variable.

abc significant differences (P<0.05) shown as different superscript letters

Sample sizes are as follows: for WC, HC, all n=169, APOE2 carriers n=18, APOE3/E3 n=106, APOE4 carriers n=43; for Blood Pressure, all n=167, APOE2 carriers n=18, APOE3/E3 n=104, APOE4 carriers n=43; for NEFA all n=166 APOE2 carriers n=17, APOE3/E3 n=105, APOE4 carriers n=42; for Adiponectin and Uric acid all n=133 APOE2 carriers n=14, APOE3/E3 n=81, APOE4 carriers n=37, Dietary Intakes all n=160 APOE2 carriers n=16, APOE3/E3 n=102, APOE4 carriers n=40.

Abbreviations: AOAC: Association of official analytical chemists, A/G fat % ratio android to gynoid fat % ratio, BMI body mass index, CHO carbohydrate, CRP C-reactive protein, HC hip circumference, HDL-C high-density lipoprotein cholesterol, LDL-C low-density lipoprotein cholesterol, MUFA monounsaturated fatty acids, NEFA non-esterified fatty acids, PUFA polyunsaturated fatty acids, SFA saturated fatty acids, TC total cholesterol, TAG triacylglycerol, VAT visceral adipose tissue, WC waist circumference.

**Supplemental Table S3.** Participant physical activity levels according to *APOE* genotype groups<sup>1</sup>

	<i>APOE</i> genotype				<i>P</i>	
	All (n=301)	<i>E2</i> carriers (n=40)	<i>E3/E3</i> (n=186)	<i>E4</i> carriers (n=71)	Genotype <sup>2</sup>	Genotype x BMI <sup>3</sup>
Steps/ day	9672±216	9500±594	9850±275	9287±446	0.54	0.31
Energy expended (kcal/day)	308±13	320±35	313±16	296±26	0.82	0.57
Percentage time per day spent:						
Sedentary	69.7±0.4	71.3±1.1	69.5±0.5	69.4±0.8	0.32	0.67
Performing light PA	25.5±0.4	23.7±1.0	25.6±0.5	26.1±0.8	0.13	0.75
Performing moderate to vigorous PA	4.8±0.2	5.1±0.4	4.8±0.2	4.6±0.3	0.67	0.23

<sup>1</sup>Data was presented as estimated marginal means ± SE, *E2* carriers= *E2/E3*, *E4* carriers= *E3/E4* and *E4/E4*.

<sup>2</sup>Data was analysed by univariate general linear model (ANCOVA) adjusted for age and sex.

<sup>3</sup>*APOE* genotype x BMI interaction by ANCOVA, adjusted for age and sex

**Supplemental Table S4.** Participant physical activity measures according to *APOE* genotype in normal and overweight/obese BMI groups<sup>1</sup>

	BMI <24.9 kg/m <sup>2</sup> (n = 203)				BMI ≥ 25.0 kg/m <sup>2</sup> (n = 98)			
	<i>E2</i> carriers (n=29)	<i>E3/E3</i> (n =127)	<i>E4</i> carriers (n = 43)	<i>P</i>	<i>E2</i> carriers (n=11)	<i>E3/E3</i> (n =59)	<i>E4</i> carriers (n = 28)	<i>P</i> <sup>2</sup>
Steps/ day	9527±724	10362±345	10001±595	0.56	9385±1007	8779±432	8142±629	0.53
Energy expended (kcal/day)	290±38	296±18	292±32	0.99	401±77	348±33	306±48	0.56
Percentage time per day spent:								
Sedentary	71.5±1.3	69.9±0.6	69.8±1.1	0.21	70.7±2.1	70.8±0.9	69.3±1.3	0.61
Performing light PA	23.4±1.2	25.9±0.6	25.5±1.0	0.17	24.3±1.8	25.1±0.8	26.8±1.1	0.38
Performing moderate to vigorous PA	5.06±0.52	5.14±0.25	4.92±0.43	0.91	4.96±0.83	4.14±0.36	3.97±0.52	0.60

<sup>1</sup>Data was presented as estimated marginal means ± SE, p<0.05 is considered significant *E2* carriers= *E2/E3*, *E4* carriers= *E3/E4* and *E4/E4*.

<sup>2</sup>Data analysed by univariate general linear model (ANCOVA) adjusted for age and sex.