Supplementary material to Ros E, et al. **Effects of long-term walnut consumption on body composition in the Walnuts And Healthy Aging (WAHA) randomized clinical trial.**

Supplementary Table S1. **Nutrient composition of walnuts (per 45 g serving).**

Energy and macronutrients	Value
Calories (kcal)	294.30
Calories from Fat (kcal)	264.10
Protein (g)	6.85
Carbohydrates (g)	6.17
Total fiber (g)	3.01
Soluble fiber (g)	0.99
Total sugars (g)	1.17
Total fat (g)	29.34
Saturated Fatty Acids (g)	2.76
Monounsaturated Fatty Acids (g)	4.02
Polyunsaturated Fatty Acids (g)	21.23
18:2 Linoleic (g)	17.14
18:3 Alpha-Linolenic (g)	4.09
Vitamins	
Vitamin E (α-Tocoferol + ɣ-Tocoferol) (mg)	0.32
Folate (µg)	44.10
Minerals	
Calcium (mg)	44.10
Magnesium (mg)	71.10
Phosphorus (mg)	155.70
Potassium (mg)	198.45
Selenium (µg)	2.21
Sodium (mg)	0.90
Zinc (mg)	1.39
Other Nutrients	
Choline (mg)	17.64
Lutein & Zeaxanthin (µg)	4.05
Lycopene (µg)	n.d.
Non-nutrient bioactive compounds	
Total Phytosterols (mg)	59.09
Total Polyphenols (mg)	709.33

Data from Food Processor Nutrition and Fitness Software (ESHA Research, Salem OR, 2012, version 10.10.0) for all variables except for total polyphenols (http://phenol-explorer.eu/) and total phytosterols (local database). n.d. indicates not detected.

Supplementary Table S2. **Definition of DXA body composition variables.**

Term	Units	Definition
Total fat mass	%	Percentage of fat mass from total body weight
Gynoid fat	%	Percentage of fat mass in the gynoid area from total gynoid mass (fat mass, lean mass and bone mineral content): Gynoid fat mass (g)/ Gynoid total tissue mass (g) X 100
Android fat	%	Percentage of fat mass in the android area from total android mass (fat mass, lean mass and bone mineral content): Android fat mass (g)/ Android total tissue mass (g) X 100
Android/Gynoid ratio	-	Android fat / Gynoid fat
Fat mass	kg	Weight of fat mass
Fat mass index	kg/m^2	Fat mass (kg) / $height^2$
Total lean mass	%	Lean soft tissue (% from total body weight) + bone mineral content (% from total body weight)
Lean/fat mass ratio	-	Lean mass (%) / fat mass (%)
Lean mass	kg	Lean soft tissue (kg) + bone mineral content (kg)
Fat/fat-free mass ratio	-	Fat mass (kg) / lean mass (kg)
Fat-free mass index	kg/m^2	Lean mass (kg) / $height^2$

Total body mass refers to the sum of total bone mineral content, fat mass, and lean mass.

Supplementary Table S3. **Energy and nutrient intake at baseline and change after 2 years of intervention by randomization group.**

	Walnuts (n=163)	Control (n=163)	*P*
Energy (kcal/d)			
Baseline	1719 (1660, 1778)	1644 (1596, 1692)	0.053
Change	146 (90, 201)	30 (-19, 79)	0.002
Total protein (g/d)			
Baseline	76.21 (73.64, 78.78)	76.03 (73.63, 78.43)	0.196
Change	4.34 (1.53, 7.15)	0.25 (-2.57, 3.06)	0.434
Total Carbohydrate (g/d)			
Baseline	179 (172, 187)	173 (167, 180)	0.842
Change	-4.9 (-12.4, 2.6)	10.7 (2.9, 18.4)	<0.001
Total sugar (g/d)			
Baseline	65 (60, 69)	61 (58, 64)	0.098
Change	-1.64 (-6.02, 3.49)	6.89 (2.96, 10.81)	0.009
Total fiber (g/d)			
Baseline	18.2 (17.2, 19.3)	17.6 (16.7, 18.4)	0.188
Change	1.42 (0.53, 2.30)	0.68 (-0.49, 1.84)	0.321
Soluble fiber (g/d)			
Baseline	3.12 (2.87, 3.37)	2.96 (2.71, 3.21)	0.253
Change	0.58 (0.33, 0.82)	0.01 (-0.27, 0.27)	0.004
Total fat (g/d)			
Baseline	75 (72, 78)	71 (69, 74)	0.960
Change	19.2 (15.8, 22.6)	-0.84 (-3.58, 1.91)	<0.001
SFA (g/d)			
Baseline	18.9 (18.0, 19.9)	17.8 (17.0, 18.6)	0.616
Change	0.86 (-0.25, 1.97)	0.17 (-0.82, 1.16)	0.427
MUFA (g/d)			
Baseline	39 (38, 41)	38 (37, 39)	0.395
Change	-0.62 (-2.46, 1.21)	-1.2 (-2.80, 0.41)	0.072
PUFA (g/d)			
Baseline	9.68 (9.14, 10.21)	9.62 (9.06, 10.17)	0.303
Change	18.5 (17.4, 19.6)	-0.81 (-1.44, -0.18)	<0.001
Linoleic acid (g/d)			
Baseline	7.86 (7.39, 8.33)	7.80 (7.30, 8.30)	0.937
Change	14.95 (13.98, 15.91)	-0.69 (-1.26, -0.13)	<0.001
N-3 PUFA (g/d)			
Baseline	1.14 (1.05, 1.24)	1.10 (1.01, 1.19)	0.637
Change	3.59 (3.41, 3.78)	-0.01 (-0.11, 0.10)	<0.001
EPA + DHA (g/d)			
Baseline	0.36 (0.29, 0.43)	0.33 (0.27, 0.39)	0.506
Change	-0.03 (-0.11, 0.04)	0.03 (-0.05, 0.11)	0.253
ALA (g/d)			
Baseline	0.80 (0.75, 0.85)	0.79 (0.75, 0.84)	0.912
Change	3.63 (3.47, 3.80)	-0.04 (-0.09, 0.020)	<0.001

Cholesterol (mg/d)			
Baseline	248 (234, 261)	249 (231, 266)	0.717
Change	-3.43 (-22.11, 15.26)	-9.62 (-31.53, 12.29)	0.671

Data are means (95% CIs). E indicates energy. SFA, saturated fatty acids; MUFA, monounsaturated fatty acids; PUFA, polyunsaturated fatty acids; LA, linoleic acid; EPA, eicosapentaenoic acid; DHA, docosahexaenoic acid, and ALA, alpha-linolenic acid.

P values obtained by unpaired *t*-test (baseline comparisons) and repeated measures ANOVA with allocated group as covariate (comparisons of changes by group).

Data from Food Processor Nutrition and Fitness Software (ESHA Research, Salem OR, 2012, version 10.10.0).

Supplementary Table S4. Baseline characteristics of the participants who completed the study by sex.

	Women (n=220)	Men (n=106)	*P*
Age, y	68.8 (68.4, 69.2)	69.4 (68.8, 70.1)	0.103
Smoking – No. (%)			0.308
Never smoker	154 (70.0)	81 (76.4)	
Former smoker	56 (25.5)	19 (17.9)	
Current smoker	10 (4.5)	6 (5.7)	
Education – No. (%)			0.470
Basic (0-4 y)	12 (5.5)	4 (3.8)	
Elementary (5.8 y)	78 (35.5)	37 (34.9)	
Secondary (9-12 y)	64 (29.0)	25 (23.6)	
Post- secondary (>12 y)	66 (30.0)	40 (37.7)	
Weight – kg	65.9 (64.6, 67.3)	80.3 (78.3, 82.4)	<0.0001
Height – cm	156.8 (5.9)	170.0 (5.2)	<0.0001
Body mass index (BMI, kg/m^2)	26.81 (26.3, 27.4)	27.8 (27.2, 28.4)	0.028
BMI categories – No. (%)			0.005
BMI < 25	73 (33.2)	16 (15.1)	
BMI ≥ 25 < 30	107 (48.6)	70 (66.0)	
BMI ≥ 30	40 (18.2)	20 (18.9)	
Waist circumference (cm)	97.1 (95.6, 98.7)	101.0 (99.4, 102.7)	<0.0001
Waist-to-height ratio	0.62 (0.08)	0.59 (0.05)	<0.0001
Hypertension - No. (%)	129 (58.6)	51 (48.1)	0.073
Type-2 diabetes – No (%)	22 (10.0)	13 (12.3)	0.536
Dyslipidemia – No. (%)	112 (50.9)	61 (57.5)	0.261
Physical activity (MET-min/d)	2816 (2579, 3053)	3322 (2881, 3763)	0.047

P from the comparison between sexes (unpaired *t*-test for quantitative variables and Chi square for categorical variables).

Supplementary Table S5. Baseline values and changes in leptin and adiponectin concentrations in completers by sex.

	Women			Men		
	Walnut diet (n=76)	**Control diet (n=72)**	***P***	**Walnut diet (n=30)**	**Control diet (n=33)**	***P***
Leptin (ng/mL)						
Baseline	25.86 (22.19, 29.53)	34.57 (29.55, 39.59)	0.005	17.74 (10.63, 24.86)	18.41 (13.2, 23.63)	0.874
Changes	-1.12 (-3.69, 1.45)	-0.11 (-2.85, 2.64)	0.587	0.17 (-1.65, 2.00)	0.96 (-5.04, 6.95)	0.216
Adiponectin (ng/mL)						
Baseline	39.21 (34.94, 43.48)	46.55 (40.89, 52.21)	0.041	21.69 (16.4, 26.97)	21.95 (17.46, 26.43)	0.939
Changes	0.76 (-2.26, 3.78)	-1.75 (-5.77, 2.27)	0.138	-4.34 (-11.89, 3.22)	-2.51 (-8.34, 3.33)	0.712
Adiponectin/Leptin ratio						
Baseline	2.06 (1.66, 2.45)	2.11 (1.55, 2.67)	0.872	1.89 (1.35, 2.43)	3.11 (0.53, 5.68)	0.399
Changes	0.21 (-0.32, 0.75)	0.18 (-0.22, 0.57)	0.802	0.56 (-0.34, 1.46)	1.11 (-4.01, 6.23)	0.680

Results are expressed as means (95% CI).

P obtained by unpaired t-test (baseline comparisons) and for the comparison between interventions from the ANCOVA analyses adjusted by baseline value of the variable, and changes in physical activity (comparisons of changes by group).

Changes after the intervention within group for which the 95% confidence interval does not include zero are statistically significant (from the repeated measures ANCOVA with age and changes in physical activity as covariates).

Supplementary Table S6. Genotype frequencies of the SNPs *FTO* rs1861868, and *APOE* genotypes in our study population according to sex and group of intervention.

	Walnut diet (n=163)		Control diet (n=163)	
	Women (n= 111)	**Men (n= 52)**	**Women (n= 109)**	**Men (n= 54)**
FTO rs1861868				
TT	31 (27.9)	13 (25.0)	30 (27.5)	15 (27.8)
CT	46 (41.4)	30 (57.7)	48 (44.0)	26 (48.1)
CC	34 (30.6)	9 (17.3)	31 (28.4)	13 (24.1)
APOE				
ε2 (ε2/2 + ε2/3)	9 (8.1)	7 (13.5)	14 (12.8)	4 (7.4)
ε3 (ε3/3)	80 (72.1)	32 (61.5)	75 (68.8)	40 (74.1)
ε4 (ε2/4 + ε3/4 + ε4/4)	22 (19.8)	13 (25.0)	20 (18.3)	10 (18.5)

Results are expressed as n(%).

Supplementary Table S7. Baseline body composition, leptin and adiponectin concentrations in completers according to the *FTO* rs1861868 single nucleotide polymorphism.

***FTO* genotype**	**Women (n=220)**	***P*[a]**	**Men (n=106)**	***P*[a]**
Body weight (kg)				
CC	64.76 (62.54, 66.98)	0.279	77.71 (73.28, 82.14)	0.185
CT/TT	66.41 (64.7, 68.11)		81.03 (78.75, 83.31)	
Body mass index (BMI, kg/m^2)				
CC	26.61 (25.61, 27.61)	0.630	26.64 (25.17, 28.11)	0.065
CT/TT	26.90 (26.26, 27.54)		28.11 (27.4, 28.82)	
Waist circumference (cm)				
CC	95.69 (93.14, 98.24)	0.243	99.12 (94.96, 103.27)	0.251
CT/TT	97.74 (95.76, 99.72)		101.52 (99.7, 103.34)	
Waist-to-height ratio				
CC	0.61 (0.60, 0.63)	0.421	0.58 (0.56, 0.60)	0.144
CT/TT	0.62 (0.61, 0.64)		0.60 (0.59, 0.61)	
Total fat mass (%)				
CC	41.86 (40.27, 43.46)	0.370	31.69 (28.56, 34.82)	0.328
CT/TT	42.65 (41.74, 43.56)		33.02 (31.88, 34.16)	
Gynoid fat (%)				
CC	49.59 (48.18, 51.01)	0.190	32.90 (29.82, 35.98)	0.777
CT/TT	50.75 (49.81, 51.69)		33.29 (32.11, 34.47)	
Android fat (%)				
CC	47.50 (44.83, 50.17)	0.331	40.59 (35.43, 45.74)	0.171
CT/TT	48.85 (47.46, 50.24)		43.57 (41.78, 45.37)	
Android/Gynoid ratio				
CC	0.95 (0.90, 1.00)	0.629	1.25 (1.10, 1.39)	0.362
CT/TT	0.96 (0.94, 0.99)		1.31 (1.27, 1.36)	
Fat mass (kg)				
CC	26.71 (24.93, 28.50)	0.278	24.19 (20.59, 27.79)	0.258
CT/TT	27.99 (26.68, 29.30)		26.09 (24.64, 27.54)	
Fat mass index (kg/m^2)				
CC	11 (10.22, 11.78)	0.468	8.30 (7.05, 9.55)	0.191
CT/TT	11.34 (10.83, 11.86)		9.05 (8.56, 9.54)	
Total lean mass (%)				
CC	58.14 (56.55, 59.73)	0.370	68.31 (65.18, 71.44)	0.327
CT/TT	57.35 (56.44, 58.26)		66.98 (65.84, 68.11)	
Lean/fat mass ratio				
CC	1.47 (1.33, 1.6)	0.219	2.32 (1.95, 2.69)	0.343

CT/TT	1.39 (1.33, 1.45)		2.14 (1.97, 2.31)	
Lean mass (kg)				
CC	36.14 (35.30, 36.99)	0.483	50.58 (48.52, 52.63)	0.267
CT/TT	36.52 (35.93, 37.11)		51.95 (50.81, 53.08)	
Fat/fat-free mass ratio				
CC	0.74 (0.69, 0.79)	0.425	0.48 (0.41, 0.55)	0.461
CT/TT	0.76 (0.73, 0.79)		0.50 (0.48, 0.53)	
Fat-free mass index (kg/m^2)				
CC	14.83 (14.48, 15.19)	0.820	17.33 (16.72, 17.94)	0.191
CT/TT	14.79 (14.6, 14.98)		18.02 (17.7, 18.33)	
***FTO* genotype**	**Women (n=148)**	***P*[a]**	**Men (n=63)**	***P*[a]**
Leptin (ng/mL)				
CC	29.06 (23.41, 34.72)	0.701	20.27 (9.51, 31.03)	0.591
CT/TT	30.41 (26.61, 34.20)		17.53 (12.89, 22.16)	
Adiponectin (ng/mL)				
CC	41.83 (34.77, 48.89)	0.739	23.23 (13.68, 32.78)	0.663
CT/TT	43.16 (39.02, 47.29)		21.45 (17.88, 25.01)	
Adiponectin/Leptin ratio				
CC	2.05 (1.43, 2.66)	0.893	1.65 (0.83, 2.48)	0.505
CT/TT	2.10 (1.69, 2.50)		2.81 (1.01, 4.61)	

Data are means (95% CIs). [a]Obtained by t test for non-related samples.

Supplementary Table S8. Changes in body composition, leptin and adiponectin concentrations in completers according to *FTO* rs1861868 genotype.

		Women		
Change	***FTO* genotype[a]**	**Walnut diet (n=111)**	**Control diet (n=109)**	***P*[b]**
Body weight (kg)				
	CC	0.80 (0.01, 1.59)	-0.22 (-1.00, 0.55)	0.201
	CT/TT	-0.05 (-0.83, 0.73)	0.07 (-0.58, 0.73)	
Body mass index (BMI, kg/m^2)				
	CC	0.33 (0.01, 0.66)	-0.08 (-0.42, 0.25)	0.190
	CT/TT	-0.04 (-0.35, 0.28)	0.03 (-0.25, 0.29)	
Waist circumference (cm)				
	CC	1.17 (0.34, 2.00)	0.20 (-0.88, 1.28)	0.434
	CT/TT	0.10 (-0.78, 0.99)	0.01 (-0.79, 0.79)	
Waist-to-height ratio				
	CC	0.01 (0.01, 0.01)	0.01 (-0.01, 0.01)	0.438
	CT/TT	0.01 (-0.01, 0.01)	-0.01 (-0.01, 0.01)	
Total fat mass (%)				
	CC	1.43 (0.65, 2.20)	1.03 (0.20, 1.87)	0.962
	CT/TT	0.78 (0.12, 1.44)	0.55 (0.06, 1.04)	
Gynoid fat (%)				
	CC	-1.38 (-2.47, -0.28)	-1.19 (-2.04, -0.33)	0.302
	CT/TT	-0.27 (-0.92, 0.38)	-0.53 (-1.04, -0.02)	
Android fat (%)				
	CC	1.64 (0.14, 3.13)	0.21 (-1.10, 1.51)	0.501
	CT/TT	1.11 (0.14, 2.07)	0.27 (-0.56, 1.10)	
Android/Gynoid ratio				
	CC	0.01 (-0.01, 0.03)	-0.02 (-0.04, 0.01)	0.885
	CT/TT	0.02 (0.01, 0.03)	-0.01 (-0.01, 0.01)	
Fat mass (kg)				
	CC	0.96 (0.22, 1.69)	0.41 (-0.39, 1.22)	0.793
	CT/TT	0.39 (-0.36, 1.13)	0.17 (-0.38, 0.71)	
Fat mass index (kg/m^2)				
	CC	0.40 (0.10, 0.70)	0.18 (-0.16, 0.52)	0.733
	CT/TT	0.14 (-0.16, 0.43)	0.06 (-0.16, 0.29)	
Total lean mass (%)				
	CC	-1.42 (-2.20, -0.65)	-1.04 (-1.88, -0.21)	0.303
	CT/TT	-0.78 (-1.44, -0.12)	-0.55 (-1.05, -0.06)	

Lean/fat mass ratio				
	CC	-0.67 (-0.83, -0.50)	-0.44 (-0.51, -0.37)	0.030
	CT/TT	-0.52 (-0.57, -0.47)	-0.47 (-0.51, -0.43)	
Lean mass (kg)				
	CC	-0.75 (-1.18, -0.33)	-0.86 (-1.37, -0.36)	0.326
	CT/TT	-0.81 (-1.09, -0.51)	-0.65 (-0.87, -0.43)	
Fat/fat-free mass ratio				
	CC	0.04 (0.02, 0.06)	0.03 (0.01, 0.06)	0.953
	CT/TT	0.03 (0.01, 0.05)	0.02 (0.01, 0.04)	
Fat-free mass index (kg/m^2)				
	CC	-0.31 (-0.48, -0.14)	-0.35 (-0.55, -0.15)	0.342
	CT/TT	-0.32 (-0.44, -0.21)	-0.26 (-0.35, -0.17)	
Change	***FTO* genotype[c]**	**Walnut diet (n=76)**	**Control diet (n=72)**	***P*[b]**
Leptin (ng/mL)				
	CC	5.22 (1.59, 8.85)	-4.46 (-13.25, 4.32)	0.020
	CT/TT	-1.52 (-5.62, 2.59)	-0.93 (-5.59, 3.72)	
Adiponectin (ng/mL)				
	CC	0.09 (-5.07, 5.25)	-2.07 (-9.07, 4.93)	0.656
	CT/TT	-1.69 (-4.70, 1.32)	0.50 (-2.49, 3.49)	
Adiponectin/Leptin ratio				
	CC	-0.53 (-1.06, -0.01)	0.07 (-0.21, 0.36)	0.154
	CT/TT	0.60 (-0.15, 1.36)	0.21 (-0.30, 0.72)	
		Man		
Change	**FTO genotype[c]**	**Walnut diet (n=52)**	**Control diet (n=54)**	***P*[b]**
Body weight (kg)				
	CC	1.53 (0.54, 2.52)	-1.78 (-4.04, 0.47)	0.020
	CT/TT	0.06 (-0.69, 0.81)	-0.09 (-0.93, 0.75)	
Body mass index (BMI, kg/m^2)				
	CC	0.52 (0.17, 0.87)	-0.64 (-1.44, 0.16)	0.022
	CT/TT	0.03 (-0.22, 0.28)	-0.03 (-0.33, 0.27)	
Waist circumference (cm)				
	CC	1.72 (-0.02, 3.46)	-1.46 (-3.42, 0.50)	0.045
	CT/TT	0.41 (-0.52, 1.34)	0.27 (-0.62, 1.16)	
Waist-to-height ratio				
	CC	0.01 (-0.01, 0.02)	-0.01 (-0.01, 0.01)	0.046
	CT/TT	0.01 (-0.01, 0.01)	0.01 (-0.01, 0.01)	
Total fat mass (%)				
	CC	2.28 (1.10, 3.45)	1.04 (-0.84, 2.92)	0.332

	CT/TT	1.23 (0.52, 1.93)	1.13 (0.50, 1,76)	
Gynoid fat (%)				
	CC	-2.00 (-3.80, -0.19)	-0.70 (-2.53, 1.13)	0.156
	CT/TT	-1.52 (-2.33, -0.71)	-1.15 (-1.91, -0.39)	
Android fat (%)				
	CC	2.95 (1.12, 4.77)	0.71 (-2.10, 3.54)	0.418
	CT/TT	1.05 (0.10, 2.00)	1.07 (0.05, 2.09)	
Android/Gynoid ratio				
	CC	0.02 (-0.06, 0.09)	0.01 (-0.05, 0.06)	0.580
	CT/TT	-0.02 (-0.05, 0.01)	-0.02 (-0.04, 0.01)	
Fat mass (kg)				
	CC	1.96 (1.01, 2.92)	-0.08 (-2.26, 2.11)	0.096
	CT/TT	0.76 (0.08, 1.44)	0.79 (0.05, 1.53)	
Fat mass index (kg/m^2)				
	CC	0.67 (0.35, 1.00)	-0.05 (-0.81, 0.72)	0.098
	CT/TT	0.28 (0.05, 0.51)	0.27 (0.01, 0.53)	
Total lean mass (%)				
	CC	-2.27 (-3.44, -1.10)	-1.04 (-2.92, 0.84)	0.222
	CT/TT	-1.23 (-1.94, -0.53)	-1.12 (-1.76, -0.49)	
Lean/fat mass ratio				
	CC	-1.36 (-1.90, -0.83)	-1.12 (-1.76, 0.49)	0.629
	CT/TT	-1.28 (-1.44, -1.13)	-1.33 (-1.59, -1.07)	
Lean mass (kg)				
	CC	-1.10 (-2.23, 0.03)	-1.95 (-2.38, -1.53)	0.227
	CT/TT	-1.26 (-1.75, -0.77)	-1.11 (-1.65, -0.57)	
Fat/fat-free mass ratio				
	CC	0.05 (0.03, 0.08)	0.02 (-0.03, 0.06)	0.213
	CT/TT	0.03 (0.01, 0.05)	0.03 (0.01, 0.04)	
Fat-free mass index (kg/m^2)				
	CC	-0.37 (-0.76, 0.01)	-0.68 (-0.83, -0.53)	0.191
	CT/TT	-0.45 (-0.61, -0.28)	-0.38 (-0.57, -0.20)	
Change	***FTO* genotype[c]**	**Walnut diet (n=30)**	**Control diet (n=33)**	***P*[b]**
Leptin (ng/mL)				
	CC	-12.38 (-39.68, 14.92)	1.34 (-6.48, 9.17)	0.195
	CT/TT	-2.32 (-10.43, 5.79)	-3.63 (-11.01, 3.75)	
Adiponectin (ng/mL)				
	CC	-3.12 (-7.41, 1.18)	2.86 (-0.27, 6.00)	0.431

CT/TT	0.10 (-1.02, 3.02)	0.35 (-7.66, 8.36)	
Adiponectin/Leptin ratio			
CC	0.86 (-1.89, 3.62)	0.01 (-0.53, 0.55)	0.988
CT/TT	0.48 (-0.56, 1.53)	1.43 (-5.30, 8.16)	

Data are expressed as mean (95% CI). Changes for which the 95% CI does not include zero are statistically significant.

[a]n = 65 CC and n = 155 CT/TT.

[b]*P* for the interaction between time (baseline vs 2 years) as repeated measure, group (control diet vs walnut diet), and the categories of the SNP, obtained by ANCOVA adjusted for in-trial changes in physical activity.

[c]n = 22 CC and n = 84 CT/TT.

Supplementary Table S9. Baseline body composition, leptin and adiponectin concentrations in completer women and men according to *APOE* genotypes.

	***APOE* genotype**	**Women (n=220)**	***P*[a]**	**Men (n=106)**	***P*[a]**
Body weight (kg)					
	ε2	67.51 (62.09, 72.91)		81.63 (74.53, 88.72)	
	ε3	66.08 (64.48, 67.69)	0.486	80.03 (77.44, 82.63)	0.883
	ε4	64.44 (61.43, 67.45)		80.68 (76.94, 84.42)	
Body mass index (BMI, kg/m^2)					
	ε2	27.47 (25.50, 29.45)		28.39 (26.01, 30.77)	
	ε3	26.85 (26.25, 27.45)	0.530	27.78 (26.93, 28.63)	0.807
	ε4	26.32 (24.91, 27.73)		27.59 (26.65, 28.53)	
Waist circumference (cm)					
	ε2	100.15 (95.09, 105.21)		102.27 (96.77, 107.77)	
	ε3	97.14 (95.24, 99.03)	0.318	100.87 (98.64, 103.11)	0.880
	ε4	95.48 (91.83, 99.13)		100.93 (98.46, 103.41)	
Waist-to-height ratio					
	ε2	0.64 (0.61, 0.67)		0.60 (0.57, 0.64)	
	ε3	0.62 (0.61, 0.63)	0.358	0.59 (0.58, 0.61)	0.804
	ε4	0.61 (0.58, 0.64)		0.59 (0.58, 0.60)	
Total fat mass (%)					
	ε2	42.54 (40.05, 45.03)		33.59 (30.21, 36.97)	
	ε3	42.55 (41.60, 43.51)	0.790	32.80 (31.41, 34.19)	0.781
	ε4	41.85 (40.03, 43.67)		32.16 (29.96, 34.35)	
Gynoid fat (%)					
	ε2	49.61 (47.54, 51.68)		33.35 (28.47, 38.22)	
	ε3	50.51 (49.54, 51.48)	0.788	32.90 (31.62, 34.19)	0.684
	ε4	50.47 (48.75, 52.18)		34.11 (31.48, 36.74)	
Android fat (%)					
	ε2	49.33 (45.50, 53.17)		44.29 (39.94, 48.64)	
	ε3	48.59 (47.07, 50.12)	0.705	43.14 (40.89, 45.39)	0.714
	ε4	47.46 (44.66, 50.26)		41.73 (37.93, 45.53)	
Android/Gynoid ratio					
	ε2	0.99 (0.93, 1.05)		1.36 (1.21, 1.51)	
	ε3	0.96 (0.93, 0.99)	0.444	1.31 (1.25, 1.36)	0.287
	ε4	0.94 (0.90, 0.98)		1.23 (1.13, 1.34)	

Fat mass (kg)				
ε2	28.30 (24.49, 32.11)		26.67 (22.17, 31.18)	
ε3	27.78 (26.52, 29.03)	0.652	25.75 (23.97, 27.52)	0.821
ε4	26.64 (24.24, 29.05)		25.07 (22.76, 27.38)	
Fat mass index (kg/m^2)				
ε2	11.49 (10.05, 12.94)		9.27 (7.72, 10.83)	
ε3	11.29 (10.79, 11.79)	0.745	8.94 (8.33, 9.54)	0.711
ε4	10.92 (9.86, 11.99)		8.58 (7.81, 9.36)	
Total lean mass (%)				
ε2	57.47 (54.97, 59.96)		66.42 (63.04, 69.81)	
ε3	57.45 (56.49, 58.41)	0.236	67.19 (65.79, 68.59)	0.784
ε4	58.15 (56.33, 59.97)		67.84 (65.64, 70.04)	
Lean/fat mass ratio				
ε2	1.40 (1.24, 1.55)		2.05 (1.71, 2.39)	
ε3	1.41 (1.34, 1.48)	0.093	2.19 (1.98, 2.39)	0.847
ε4	1.44 (1.33, 1.55)		2.21 (1.91, 2.51)	
Lean mass (kg)				
ε2	36.93 (35.15, 38.71)		51.84 (48.33, 55.35)	
ε3	36.46 (35.87, 37.05)	0.560	51.35 (50.21, 52.48)	0.611
ε4	35.95 (35.01, 36.90)		52.56 (49.94, 55.19)	
Fat/fat-free mass ratio				
ε2	0.76 (0.68, 0.83)		0.51 (0.44, 0.59)	
ε3	0.76 (0.73, 0.79)	0.792	0.50 (0.47, 0.53)	0.753
ε4	0.74 (0.68, 0.80)		0.48 (0.44, 0.53)	
Fat-free mass index (kg/m^2)				
ε2	15.05 (14.40, 15.70)		18.02 (16.90, 19.15)	
ε3	14.81 (14.62, 14.99)	0.458	17.82 (17.48, 18.16)	0.863
ε4	14.64 (14.20, 15.09)		17.96 (17.35, 18.58)	
APOE genotype	**Women (n=148)**	***P*[a]**	**Men (n=63)**	***P*[a]**
Leptin (ng/mL)				
ε2	31.53 (16.99, 46.07)		12.25 (7.81, 42.31)	
ε3	30.57 (26.91, 34.24)	0.703	20.81 (15.11, 26.50)	0.169
ε4	27.47 (20.78, 34.15)		12.47 (7.92, 17.03)	
Adiponectin (ng/mL)				
ε2	47.63 (34.32, 60.95)		17.58 (4.32, 59.47)	
ε3	41.21 (37.17, 45.25)	0.399	22.54 (18.83, 26.25)	0.759
ε4	45.68 (36.71, 54.65)		20.87 (12.69, 29.06)	
Adiponectin/Leptin ratio				
ε2	1.88 (0.71, 3.04)		2.33 (0.25, 7.92)	
ε3	2.01 (1.59, 2.42)	0.584	2.79 (0.71, 4.87)	0.901
ε4	2.42 (1.71, 3.13)		2.05 (1.18, 2.92)	

Data are means (95% CIs). [a]Obtained by one-way ANOVA analyses.

Supplementary Table S10. Changes in body composition, leptin and adiponectin concentrations in completer women and men according to *APOE* genotypes.

Change	*APOE* genotype[a]	Women			Men		
		Walnut diet (n=111)	Control diet (n=109)	*P*[b]	Walnut diet (n=52)	Control diet (n=54)	*P*[b]
Body weight (kg)							
	ε2	0.96 (-2.38. 4.29)	-0.61 (-2.32, 1.10)		1.43 (-0.02, 2.87)	0.95 (-2.38, 4.28)	
	ε3	-0.03 (-0.76, 0.69)	-0.04 (-0.71, 0.62)	0.520	0.28 (-0.57, 1.14)	-0.42 (-1.47, 0.63)	0.801
	ε4	0.81 (-0.13, 1.74)	0.52 (-0.18, 1.22)		-0.19 (-1.74, 1.36)	-1.38 (-2.66, -0.11)	
Body mass index (BMI, kg/m^2)							
	ε2	0.37 (-1.03, 1.76)	-0.25 (-0.96, 0.45)		0.49 (0.01, 0.97)	0.32 (-0.82, 1.47)	
	ε3	-0.03 (-0.32, 0.26)	-0.02 (-0.30, 0.25)	0.461	0.09 (-0.20, 0.38)	-0.15 (-0.53, 0.22)	0.067
	ε4	0.33 (-0.07, 0.72)	0.24 (-0.05, 0.53)		-0.03 (-0.55, 0.48)	-0.48 (-0.92, -0.04)	
Waist circumference (cm)							
	ε2	2.22 (-1.38, 5.82)	-0.72 (-2.29, 0.85)		2.36 (1.53, 3.19)	1.08 (-4.58, 6.73)	
	ε3	0.11 (-0.67, 0.87)	0.08 (-0.71, 0.87)	0.735	0.52 (-0.60, 1.63)	0.05 (-0.96, 1.06)	0.099
	ε4	0.94 (-0.42, 2.31)	0.50 (-1.15, 2.15)		0.00 (-1.84, 1.84)	-1.30 (-2.56, -0.04)	
Waist-to-height ratio							
	ε2	0.01 (-0.01, 0.04)	0.00 (-0.01, 0.01)		0.01 (0.01, 0.02)	0.01 (-0.03, 0.04)	
	ε3	0.00 (0.00, 0.01)	0.00 (0.00, 0.01)	0.725	0.00 (0.00, 0.01)	0.00 (-0.01, 0.01)	0.110
	ε4	0.01 (-0.01, 0.01)	0.00 (-0.01, 0.01)		0.00 (-0.01, 0.01)	-0.01 (-0.02, 0.01)	
Total fat mass (%)							
	ε2	2.42 (-0.78, 5.62)	0.16 (-1.23, 1.56)		1.93 (0.25, 3.61)	1.95 (-0.09, 3.99)	
	ε3	0.62 (0.04, 1.21)	0.72 (0.19, 1.25)	0.422	1.27 (0.49, 2.05)	1.06 (0.29, 1.81)	0.365
	ε4	1.70 (0.78, 2.61)	0.94 (0.16, 1.73)		1.48 (-0.09, 3.05)	0.99 (-0.76, 2.74)	
Gynoid fat (%)							

	ε2	-2.17 (-5.36, 1.03)	-0.17 (-1.6, 1.26)		-1.50 (-3.23, 0.23)	-1.39 (-3.80, 1.03)	
	ε3	-0.29 (-0.94, 0.36)	-0.67 (-1.19, -0.14)	0.220	-1.54 (-2.48, -0.60)	-1.12 (-1.89, -0.36)	0.466
	ε4	-1.12 (-2.23, -0.01)	-1.3 (-2.34, -0.26)		-1.81 (-3.62, 0.01)	-0.59 (-3.12, 1.94)	
Android fat (%)							
	ε2	3.65 (-1.73, 9.03)	-0.06 (-2.21, 2.08)		2.13 (-0.22, 4.47)	2.63 (-0.34, 5.59)	
	ε3	0.89 (-0.02, 1.80)	0.29 (-0.58, 1.18)	0.313	1.25 (0.20, 2.31)	0.98 (-0.25, 2.20)	0.159
	ε4	1.65 (0.34, 2.97)	0.30 (-1.07, 1.66)		1.28 (-0.94, 3.51)	0.35 (-1.83, 2.53)	
Android/Gynoid ratio							
	ε2	0.04 (-0.02, 0.09)	0.00 (-0.03, 0.03)		0.01 (-0.06, 0.08)	0.03 (-0.13, 0.19)	
	ε3	0.01 (0.00, 0.03)	-0.01 (-0.02, 0.00)	0.113	-0.02 (-0.05, 0.01)	-0.01 (-0.04, 0.02)	0.648
	ε4	0.01 (-0.01, 0.03)	-0.01 (-0.04, 0.01)		-0.02 (-0.06, 0.02)	-0.02 (-0.07, 0.02)	
Fat mass (kg)							
	ε2	1.84 (-1.61, 5.28)	-0.38 (-1.98, 1.22)		1.62 (0.10, 3.15)	1.83 (-0.67, 4.33)	
	ε3	0.22 (-0.43, 0.88)	0.25 (-0.31, 0.81)	0.854	0.87 (0.17, 1.58)	0.51 (-0.41, 1.44)	0.175
	ε4	1.27 (0.35, 2.18)	0.62 (-0.07, 1.30)		0.85 (-0.81, 2.51)	0.37 (-1.22, 1.95)	
Fat mass index (kg/m^2)							
	ε2	0.74 (-0.69, 2.17)	-0.17 (-0.82, 0.49)		0.58 (0.03, 1.13)	0.63 (-0.22, 1.49)	
	ε3	0.08 (-0.18, 0.34)	0.10 (-0.13, 0.34)	0.167	0.31 (0.08, 0.55)	0.17 (-0.15, 0.50)	0.888
	ε4	0.51 (0.14, 0.89)	0.27 (-0.02, 0.56)		0.32 (-0.24, 0.88)	0.12 (-0.43, 0.66)	
Total lean mass (%)							
	ε2	-2.43 (-5.63. 0.77)	-0.18 (-1.58, 1.22)		-1.93 (-3.61, -0.25)	-1.99 (-4.04, 0.03)	
	ε3	-0.62 (-1.19, -0.04)	-0.72 (-1.25, -0.19)	0.109	-1.28 (-2.06, -0.50)	-1.04 (-1.80, -0.29)	0.937
	ε4	-1.69 (-2.61, -0.77)	-0.94 (-1.72, -0.16)		-1.46 (-3.03, 0.11)	-0.99 (-2.72, 0.75)	
Lean/fat mass ratio							

	ε2	-0.57 (-0.77, -0.38)	-0.47 (-0.59, -0.36)		-1.17 (-1.57, -0.78)	-1.37 (-1.87, -0.87)	
	ε3	-0.57 (-0.65, -0.49)	-0.46 (-0.49, -0.41)	0.994	-1.28 (-1.43, -1.13)	-1.38 (-1.67, -1.09)	0.946
	ε4	-0.57 (-0.64, -0.51)	-0.48 (-0.58, -0.38)		-1.39 (-1.88, -0.91)	-1.32 (-1.56, -1.07)	
Lean mass (kg)							
	ε2	-1.40 (-2.91, 0.12)	-0.76 (-1.50, -0.01)		-1.41 (-2.45, -0.36)	-0.82 (-1.74, 0.09)	
	ε3	-0.69 (-0.95, -0.42)	-0.77 (-1.01, -0.52)	0.290	-1.08 (-1.72, -0.45)	-1.22 (-1.74, -0.70)	0.721
	ε4	-0.88 (-1.38, -0.39)	-0.47 (-0.98, 0.04)		-1.50 (-2.25, -0.76)	-1.88 (-3.01, -0.76)	
Fat/fat-free mass ratio							
	ε2	0.08 (-0.02, 0.18)	0.01 (-0.04, 0.05)		0.05 (0.01, 0.09)	0.04 (0.01, 0.09)	
	ε3	0.02 (0.01, 0.04)	0.02 (0.01, 0.04)	0.083	0.03 (0.01, 0.05)	0.02 (0.01, 0.04)	0.982
	ε4	0.05 (0.02, 0.08)	0.03 (0.01, 0.05)		0.03 (0.01, 0.07)	0.03 (-0.01, 0.07)	
Fat-free mass index (kg/m^2)							
	ε2	-0.59 (-1.22, 0.04)	-0.30 (-0.60, -0.01)		-0.50 (-0.87, -0.13)	-0.29 (-0.61, 0.03)	
	ε3	-0.28 (-0.38, -0.17)	-0.31 (-0.41, -0.21)	0.253	-0.39 (-0.60, -0.17)	-0.42 (-0.60, -0.24)	0.706
	ε4	-0.35 (-0.55, -0.15)	-0.19 (-0.39, 0.01)		-0.51 (-0.76, -0.26)	-0.65 (-1.07, -0.24)	

		Women			**Men**		
Change	***APOE* genotype[a]**	**Walnut diet (n=76)**	**Control diet (n=72)**	***P*[b]**	**Walnut diet (n=30)**	**Control diet (n=33)**	***P*[b]**
Leptin (ng/mL)							
	ε2	5.55 (-5.34, 16.45)	-8.20 (-26.58, 10.19)		4.29 (-19.3, 27.89)	3.92 (-18.71, 24.33)	
	ε3	0.41 (-3.41, 4.23)	-3.16 (-7.90, 1.58)	0.248	-7.65 (-19.20, 3.91)	-4.95 (-12.65, 2.74)	0.361
	ε4	0.33 (-5.62, 6.28)	6.28 (-1.19, 13.75)		0.77 (-7.50, 9.04)	4.08 (-4.74, 12.91)	
Adiponectin (ng/mL)							
	ε2	-3.54 (-10.58, 3.49)	1.19 (-8.59, 10.98)		-1.55 (-10.28, 7.17)	0.78 (-8.74, 9.81)	
	ε3	-0.92 (-4.32, 2.47)	0.65 (-2.21, 3.51)	0.210	0.08 (-2.60, 2.77)	3.75 (-2.58, 10.07)	0.905
	ε4	-0.64 (-3.78, 2.5)	-3.3 (-12.19, 5.59)		0.88 (-2.45, 4.2)	-6.93 (-25.76, 11.89)	

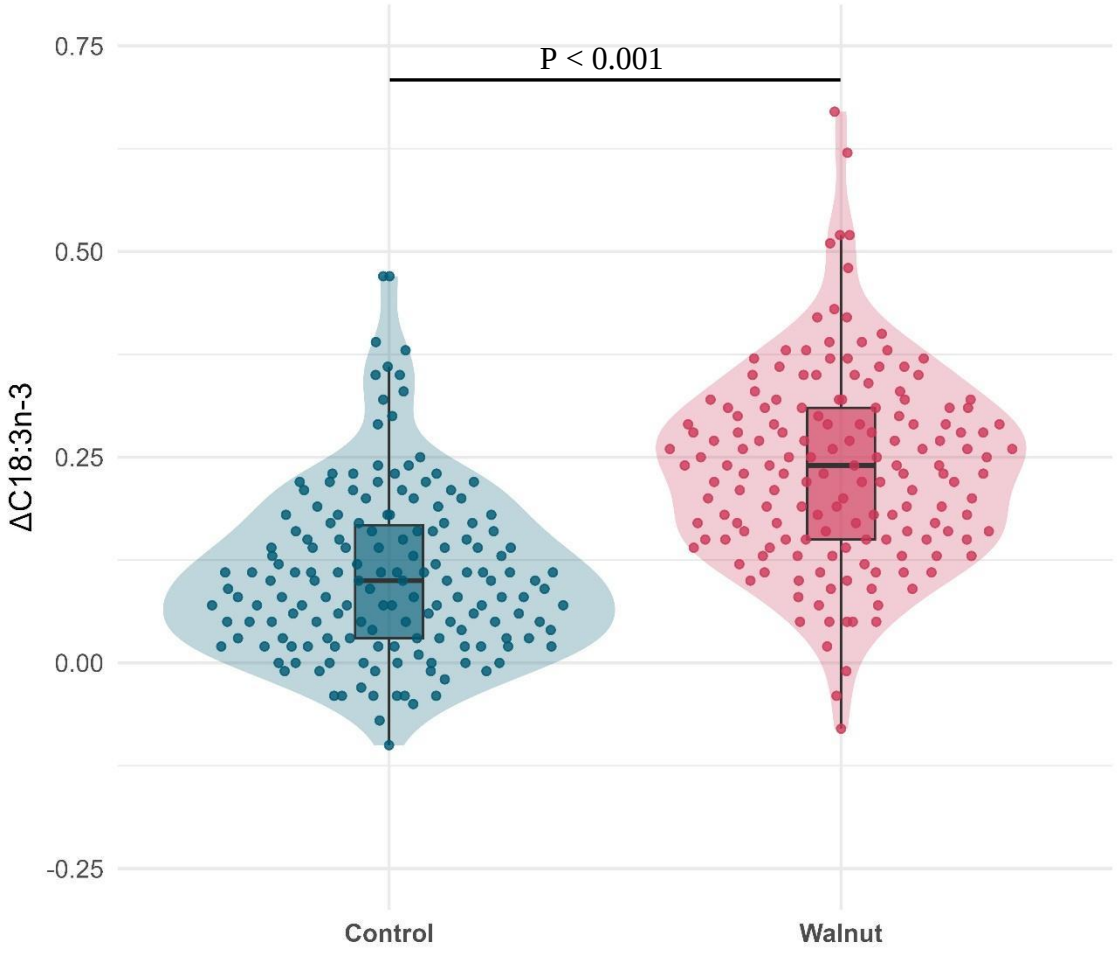
Adiponectin/Leptin ratio						
ε2	-0.48 (-1.33, 0.37)	0.86 (-0.26, 1.99)		-1.62 (-10.18, 6.94)	-1.53 (-9,52, 10.15)	
ε3	0.15 (-0.34, 0.63)	0.35 (-0.09, 0.80)	0.792	1.01 (-0.20, 2.22)	1.98 (-5.36, 9.32)	0.477
ε4	0.70 (-1.5, 2.91)	-0.75 (-1.83, 0.33)		0.15 (-1.64, 1.94)	-1.14 (-3.05, 0.78)	

Data are expressed as mean (95% confidence interval).

[a]n = 34 ε2 (ε2/2 + ε2/3); n= 227 ε3 (ε3/3); and n= 65 ε4 (ε2/4 + ε3/4 + ε4/4).

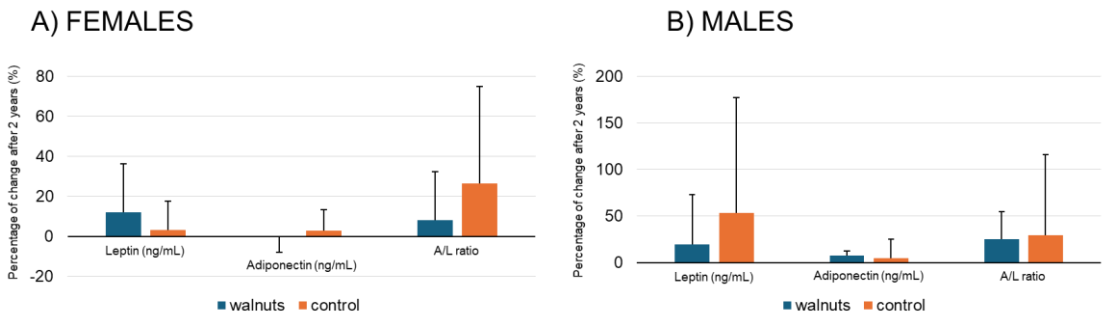
[b]Obtained by ANCOVA adjusted for baseline value of each variable and in-trial change in physical activity. Changes for which the 95% confidence interval does not include zero are significantly different from the baseline.

Supplementary Figure S1. 2-Year changes in the percentage of α-linolenic acid in red blood cells by group allocation.



Y axis indicates the differences between final and initial values. Dot and box plots show individual values and depict the median (horizontal bar), interquartile range (IQR, hinges) and 1.5 × IQR (whiskers).

Supplementary Figure S2. Percent changes in circulating leptin and adiponectin by sex after 2 years of intervention with a walnut diet vs a control diet.



Results are expressed as mean (95% CI). A/L ratio indicates Adiponectin/Leptin ratio. Between-group differences are non-significant.