Supplementary Table 1. Genotype Distribution of *FADS1-FADS2* polymorphism in the HELENA study

		Athens (Greece)	Dortmund (Germany)	Gent (Belgium)	Heraklion (Crete)	Lille (France)	Pecs (Hungary)	Roma (Italy)	Stockholm (Sweden)	Vienna (Austria)	Zaragoza (Spain)
rs174546	**11**	73 (0.57)	59 (0.48)	45 (0.40)	56 (0.49)	48 (0.50)	64 (0.47)	44 (0.50)	58 (0.50)	54 (0.46)	57 (0.50)
	12	45 (0.35)	56 (0.45)	50 (0.45)	53 (0.48)	37 (0.38)	62 0.45)	34 (0.38)	46 (0.40)	52 (0.45)	44 (0.39)
	22	10 (0.08)	9 (0.07)	17 (0.15)	3 (0.03)	12 (0.12)	11 (0.08)	11 (0.12)	11 (0.10)	11 (0.09)	13 (0.11)
rs968567	**11**	89 (0.70)	89 (0.72)	69 (0.62)	76 (0.70)	64 (0.66)	102 (0.75)	69 (0.77)	80 (0.69)	81 (0.69)	84 (0.74)
	12	32 (0.25)	32 (0.26)	35 (0.31)	33 (0.30)	29 (0.30)	32 (0.23)	19 (0.21)	33 (0.29)	33 (0.28)	25 (0.22)
	22	7 (0.05)	3 (0.02)	8 (0.07)	0 (0.00)	4 (0.04)	3 (0.02)	2 (0.02)	2 (0.02)	3 (0.03)	5 (0.04)
rs174570	**11**	114 (0.89)	95 (0.77)	88 (0.78)	94 (0.85)	79 (0.81)	105 (0.77)	68 (0.76)	93 (0.81)	90 (0.77)	84 (0.74)
	12	14 (0.11)	28 (0.22)	21 (0.19)	15 (0.14)	14 (0.15)	31 (0.22)	19 (0.21)	21 (0.18)	27 (0.23)	27 (0.24)
	22	0 (0.00)	1 (0.01)	3 (0.03)	1 (0.01)	4 (0.04)	1 (0.01)	3 (0.03)	1 (0.01)	0 (0.00)	3 (0.02)
rs174572	**11**	82 (0.64)	75 (0.61)	58 (0.52)	64 (0.58)	57 (0.59)	83 (0.61)	52 (0.58)	71 (0.62)	67 (0.57)	68 (0.60)
	12	35 (0.27)	45 (0.36)	46 (0.41)	44 (0.40)	35 (0.36)	48 (0.35)	32 (0.35)	38 (0.33)	45 (0.39)	39 (0.34)
	22	11 (0.09)	4 (0.03)	8 (0.07)	2 (0.02)	5 (0.05)	6 (0.04)	6 (0.07)	6 (0.05)	5 (0.04)	7 (0.06)
rs2072113	**11**	113 (0.88)	98 (0.79)	81 (0.72)	89 (0.82)	79 (0.82)	104 (0.76)	73 (0.81)	91 (0.79)	96 (0.82)	94 (0.82)
	12	15 (0.12)	23 (0.19)	28 (0.25)	19 (0.18)	14 (0.14)	33 (0.24)	14 (0.16)	22 (0.19)	20 (0.17)	19 (0.17)
	22	0 (0.00)	3 (0.02)	3 (0.03)	0 (0.00)	4 (0.04)	0 (0.00)	3 (0.03)	2 (0.02)	1 (0.01)	1 (0.01)
rs2072114	**11**	111 (0.87)	95 (0.77)	80 (0.71)	90 (0.82)	76 (0.78)	102 (0.74)	73 (0.81)	91 (0.79)	94 (0.80)	94 (0.82)
	12	17 (0.13)	26 (0.21)	29 (0.26)	29 (0.18)	17 (0.18)	35 (0.26)	14 (0.16)	22 (0.19)	21 (0.18)	19 (0.17)
	22	0 (0.00)	3 (0.02)	3 (0.03)	0 (0.00)	4 (0.04)	0 (0.00)	3 (0.03)	2 (0.02)	2 (0.02)	1 (0.01)
rs174587	**11**	86 (0.67)	82 (0.66)	71 (0.63)	67 (0.61)	63 (0.65)	96 (0.70)	57 (0.64)	76 (0.66)	72 (0.62)	73 (0.64)
	12	32 (0.25)	39 (0.32)	36 (0.32)	42 (0.38)	29 (0.30)	38 (0.28)	30 (0.33)	36 (0.31)	41 (0.35)	35 (0.31)
	22	10 (0.08)	3 (0.02)	5 (0.05)	1 (0.01)	5 (0.05)	3 (0.02)	3 (0.03)	3 (0.03)	4 (0.03)	6 (0.05)
rs174589	**11**	87 (0.68)	77 (0.65)	67 (0.62)	67 (0.61)	62 (0.65)	93 (0.69)	53 (0.61)	70 (0.67)	71 (0.61)	68 (0.63)
	12	31 (0.24)	38 (0.32)	36 (0.34)	41 (0.37)	29 (0.30)	39 (0.29)	31 (0.36)	32 (0.30)	42 (0.36)	33 (0.31)
	22	10 (0.08)	3 (0.03)	4 (0.04)	3 (0.02)	5 (0.05)	3 (0.02)	3 (0.03)	3 (0.03)	3 (0.03)	6 (0.06)
rs174602	**11**	75 (0.59)	78 (0.64)	69 (0.64)	63 (0.59)	50 (0.52)	82 (0.60)	47 (0.52)	78 (0.70)	69 (0.59)	82 (0.73)
	12	46 (0.36)	36 (0.29)	34 (0.31)	41 (0.38)	35 (0.36)	46 (0.34)	38 (0.42)	28 (0.25)	44 (0.38)	25 (0.22)
	22	6 (0.05)	9 (0.07)	5 (0.05)	3 (0.03)	12 (0.12)	8 (0.06)	8 (0.06)	5 (0.05)	4 (0.03)	5 (0.05)
rs498793	**11**	46 (0.36)	57 (0.46)	56 (0.50)	35 (0.32)	40 (0.41)	43 (0.31)	27 (0.30)	33 (0.29)	43 (0.37)	39 (0.35)
	12	63 (0.49)	49 (0.39)	44 (0.39)	58 (0.53)	38 (0.39)	70 (0.51)	49 (0.54)	60 (0.53)	52 (0.44)	49 (0.43)
	22	19 (0.15)	18 (0.15)	12 (0.11)	17 (0.15)	19 (0.20)	24 (0.18)	14 (0.16)	21 (0.18)	22 (0.19)	25 (0.22)
rs526126	**11**	83 (0.65)	77 (0.62)	67 (0.60)	66 (0.63)	61 (0.63)	97 (0.71)	61 (0.68)	70 (0.61)	73 (0.63)	80 (0.70)
	12	40 (0.31)	44 (0.36)	39 (0.35)	34 (0.33)	29 (0.30)	34 (0.25)	26 (0.29)	40 (0.35)	37 (0.32)	32 (0.28)
	22	5 (0.04)	3 (0.02)	5 (0.05)	4 (0.04)	7 (0.07)	6 (0.04)	3 (0.03)	4 (0.04)	6 (0.05)	2 (0.02)
rs174611	**11**	67 (0.52)	61 (0.49)	50 (0.45)	58 (0.53)	54 (0.56)	74 (0.54)	50 (0.55)	58 (0.51)	64 (0.55)	63 (0.55)
	12	45 (0.35)	57 (0.46)	51 (0.45)	46 (0.42)	40 (0.41)	54 (0.39)	35 (0.39)	51 (0.44)	43 (0.37)	42 (0.37)
	22	16 (0.13)	6 (0.05)	11 (0.10)	6 (0.05)	3 (0.03)	9 (0.07)	5 (0.06)	6 (0.05)	10 (0.08)	9 (0.08)
rs174616	**11**	36 (0.28)	35 (0.28)	27 (0.24)	25 (0.23)	32 (0.33)	39 (0.29)	21 (0.23)	34 (0.30)	34 (0.29)	28 (0.24)
	12	62 (0.48)	65 (0.53)	56 (0.50)	51 (0.47)	49 (0.51)	70 (0.51)	45 (0.50)	60 (0.52)	56 (0.48)	60 (0.53)
	22	30 (0.24)	23 (0.19)	29 (0.26)	33 (0.30)	16 (0.16)	28 (0.20)	24 (0.27)	21 (0.18)	27 (0.23)	26 (0.23)

Data are N (frequency).

Supplementary Table 2. LCPUFA values according to genotypes.

	11	12	22	*p* *
rs174546				
C18:2n-6	21.50 (2.49)	22.44 (2.41)	23.42 (2.59)	*1.9E-18*
C18:3n-6	0.09 (0.04)	0.08 (0.03)	0.08 (0.02)	*0.0001*
C20:3n-6	2.85 (0.63)	3.09 (0.69)	3.20 (0.76)	*3.7E-12*
C20:4n-6	10.37 (1.51)	9.24 (1.37)	7.89 (1.23)	*7.1E-69*
C18:3n-3	0.13 (0.07)	0.14 (0.08)	0.19 (0.10)	*2.0E-13*
C18:4n-3	0.05 (0.07)	0.05 (0.09)	0.04 (0.02)	*0.43*
C20:5n-3	0.51 (0.31)	0.48 (0.32)	0.46 (0.37)	*4.2E-06*
C22:6n-3	2.99 (0.97)	2.90 (0.90)	2.89 (0.99)	*0.006*
rs968567				
C18:2n-6	21.88 (2.61)	22.41 (2.36)	23.16 (2.14)	*1.5E-05*
C18:3n-6	0.09 (0.04)	0.08 (0.03)	0.08 (0.02)	*0.04*
C20:3n-6	2.88 (0.65)	3.22 (0.68)	3.43 (0.67)	*3.1E-18*
C20:4n-6	9.95 (1.63)	9.10 (1.40)	8.19 (1.32)	*3.8E-19*
C18:3n-3	0.13 (0.07)	0.15 (0.08)	0.19 (0.11)	*2.3E-07*
C18:4n-3	0.05 (0.07)	0.06 (0.11)	0.04 (0.02)	*0.35*
C20:5n-3	0.50 (0.32)	0.46 (0.31)	0.44 (0.18)	*0.0004*
C22:6n-3	2.97 (0.96)	2.88 (0.89)	3.07 (0.96)	*0.08*
rs174570				
C18:2n-6	21.85 (2.49)	22.79 (2.50)	23.82 (3.99)	*1.8E-08*
C18:3n-6	0.09 (0.04)	0.08 (0.03)	0.08 (0.02)	*0.01*
C20:3n-6	2.99 (0.66)	2.98 (0.74)	2.58 (0.80)	*0.42*
C20:4n-6	9.91 (1.59)	8.87 (1.42)	7.39 (0.86)	*4.5E-28*
C18:3n-3	0.14 (0.07)	0.15 (0.08)	0.19 (0.10)	*0.0001*
C18:4n-3	0.05 (0.08)	0.05 (0.07)	0.04 (0.01)	*0.48*
C20:5n-3	0.49 (0.30)	0.47 (0.34)	0.55 (0.59)	*0.02*
C22:6n-3	2.95 (0.94)	2.92 (0.93)	3.00 (1.36)	*0.24*
rs174572				
C18:2n-6	21.70 (2.56)	22.46 (2.48)	23.37 (2.16)	*1.5E-10*
C18:3n-6	0.09 (0.04)	0.08 (0.03)	0.08 (0.03)	*0.003*
C20:3n-6	2.88 (0.66)	3.11 (0.70)	3.30 (0.63)	*1.9E-11*
C20:4n-6	10.13 (1.59)	9.10 (1.43)	8.24 (1.31)	*2.2E-36*
C18:3n-3	0.13 (0.07)	0.15 (0.08)	0.18 (0.10)	*2.2E-11*
C18:4n-3	0.05 (0.07)	0.05 (0.09)	0.04 (0.02)	*0.77*
C20:5n-3	0.51 (0.30)	0.48 (0.34)	0.43 (0.27)	*2.0E-05*
C22:6n-3	3.00 (0.97)	2.88 (0.90)	2.88 (0.89)	*0.004*
rs2072114				
C18:2n-6	21.83 (2.50)	22.92 (2.58)	23.06 (2.55)	*1.2E-09*
C18:3n-6	0.09 (0.04)	0.08 (0.02)	0.08 (0.03)	*0.04*
C20:3n-6	2.96 (0.68)	3.04 (0.66)	3.27 (1.05)	*0.03*
C20:4n-6	9.91 (1.59)	8.90 (1.43)	7.24 (0.70)	*2.5E-26*
C18:3n-3	0.14 (0.07)	0.15 (0.07)	0.23 (0.09)	*0.0004*
C18:4n-3	0.05 (0.08)	0.05 (0.07)	0.05 (0.02)	*0.61*
C20:5n-3	0.49 (0.31)	0.48 (0.35)	0.56 (0.40)	*0.06*
C22:6n-3	2.97 (0.94)	2.86 (0.96)	2.97 (0.84)	*0.08*

Supplementary Table 2 (continued). LCPUFA values according to genotypes.

	11	12	22	p*
rs174589				
C18:2n-6	21.81 (2.48)	22.40 (2.57)	23.49 (2.30)	*1.2E-07*
C18:3n-6	0.09 (0.04)	0.08 (0.03)	0.08 (0.03)	*0.01*
C20:3n-6	2.91 (0.66)	3.11 (0.72)	3.33 (0.60)	*5.5E-09*
C20:4n-6	10.03 (1.60)	9.21 (1.50)	8.03 (1.34)	*3.4E-25*
C18:3n-3	0.13 (0.07)	0.14 (0.08)	0.18 (0.11)	*6.9E-07*
C18:4n-3	0.05 (0.07)	0.05 (0.10)	0.05 (0.02)	*0.39*
C20:5n-3	0.50 (0.31)	0.47 (0.34)	0.41 (0.18)	*0.0002*
C22:6n-3	2.95 (0.95)	2.90 (0.91)	2.91 (0.96)	*0.08*
rs174602				
C18:2n-6	21.78 (2.53)	22.34 (2.50)	23.54 (2.56)	*1.0E-09*
C18:3n-6	0.09 (0.04)	0.09 (0.03)	0.08 (0.02)	*0.09*
C20:3n-6	2.98 (0.68)	2.99 (0.68)	3.01 (0.71)	*0.86*
C20:4n-6	9.90 (1.58)	9.38 (1.61)	8.97 (1.79)	*1.2E-12*
C18:3n-3	0.13 (0.07)	0.14 (0.08)	0.17 (0.11)	*0.002*
C18:4n-3	0.05 (0.09)	0.05 (0.05)	0.05 (0.02)	*0.76*
C20:5n-3	0.50 (0.31)	0.49 (0.34)	0.41 (0.26)	*0.006*
C22:6n-3	3.01 (1.01)	2.87 (0.83)	2.71 (0.76)	*0.06*
rs498793				
C18:2n-6	22.22 (2.55)	22.13 (2.58)	21.54 (2.42)	*0.01*
C18:3n-6	0.09 (0.03)	0.09 (0.04)	0.09 (0.04)	*0.16*
C20:3n-6	2.97 (0.67)	3.01 (0.70)	2.97 (0.66)	*0.87*
C20:4n-6	9.50 (1.66)	9.70 (1.57)	9.99 (1.67)	*0.003*
C18:3n-3	0.14 (0.08)	0.14 (0.08)	0.13 (0.06)	*0.09*
C18:4n-3	0.05 (0.06)	0.09 (0.04)	0.05 (0.06)	*0.75*
C20:5n-3	0.49 (0.35)	0.47 (0.29)	0.53 (0.31)	*0.03*
C22:6n-3	2.92 (0.89)	2.90 (0.93)	3.12 (1.06)	*0.08*
rs526126				
C18:2n-6	21.96 (2.58)	22.17 (2.50)	22.85 (2.45)	*0.003*
C18:3n-6	0.09 (0.04)	0.09 (0.03)	0.08 (0.02)	*0.11*
C20:3n-6	2.94 (0.67)	3.06 (0.69)	3.01(0.72)	*0.04*
C20:4n-6	9.84 (1.67)	9.37 (1.52)	9.25 (1.44)	*1.3E-05*
C18:3n-3	0.14 (0.07)	0.15 (0.08)	0.15 (0.06)	*0.04*
C18:4n-3	0.05 (0.09)	0.05 (0.04)	0.05 (0.02)	*0.07*
C20:5n-3	0.50 (0.31)	0.48 (0.33)	0.52 (0.35)	*0.02*
C22:6n-3	2.96 (0.96)	2.91 (0.91)	3.04 (0.93)	*0.24*
rs174611				
C18:2n-6	21.76 (2.61)	22.37 (2.44)	22.51 (2.49)	*6.1E-05*
C18:3n-6	0.09 (0.04)	0.08 (0.03)	0.08 (0.02)	*0.003*
C20:3n-6	2.92 (0.66)	3.04 (0.70)	3.18 (0.69)	*0.0002*
C20:4n-6	10.08 (1.62)	9.26 (1.49)	9.02 (1.70)	*9.3E-18*
C18:3n-3	0.13 (0.07)	0.15 (0.08)	0.16 (0.10)	*0.0002*
C18:4n-3	0.05 (0.06)	0.05 (0.10)	0.04 (0.02)	*0.45*
C20:5n-3	0.51 (0.31)	0.47 (0.32)	0.47 (0.28)	*0.01*
C22:6n-3	2.96 (0.96)	2.90 (0.92)	3.08 (0.88)	*0.94*
rs174616				
C18:2n-6	21.49 (2.59)	22.26 (2.44)	22.28 (2.65)	*3.2E-05*
C18:3n-6	0.09 (0.04)	0.09 (0.04)	0.09 (0.03)	*0.11*
C20:3n-6	2.92 (0.64)	2.97 (0.68)	3.09 (0.72)	*0.02*
C20:4n-6	10.26 (1.57)	9.52 (1.54)	9.34 (1.72)	*4.9E-15*
C18:3n-3	0.13 (0.06)	0.14 (0.08)	0.14 (0.08)	*0.03*
C18:4n-3	0.05 (0.07)	0.05 (0.09)	0.05 (0.02)	*0.80*
C20:5n-3	0.52 (0.30)	0.48 (0.32)	0.48 (0.34)	*0.004*
C22:6n-3	3.08 (1.01)	2.89 (0.94)	2.92 (0.85)	*0.05*

Major allele : 1, minor allele : 2 . Data are mean (SD). The fatty acids are in percent of total fatty acids. p value is for trend. *p values were adjusted for age, gender, BMI and center.

Supplementary Table 3. Lipids levels and BMI according to genotypes.

	11	12	22	*p* *
rs174546				
Total cholesterol (mmol/l)	4.19 (0.71)	4.12 (0.70)	4.15 (0.74)	*0.13*
HDL (mmol/l)	1.44 (0.28)	1.43 (0.27)	1.40 (0.26)	*0.07*
LDL (mmol/l)	2.45 (0.64)	2.43 (0.62)	2.47 (0.63)	*0.90*
Triglyceride (mmol/l)	0.78 (0.37)	0.77 (0.37)	0.82 (0.40)	*0.65*
BMI (kg/m^2)	21.46 (3.76)	21.19 (3.68)	21.15 (3.91)	*0.70*
rs968567				
Total cholesterol (mmol/l)	4.17 (0.72)	4.12 (0.67)	4.20 (0.77)	*0.31*
HDL (mmol/l)	1.43 (0.28)	1.42 (0.28)	1.39 (0.25)	*0.21*
LDL (mmol/l)	2.44 (0.63)	2.43 (0.60)	2.59 (0.76)	*0.67*
Triglyceride (mmol/l)	0.78 (0.38)	0.78 (0.37)	0.77 (0.35)	*0.99*
BMI (kg/m^2)	21.39 (3.74)	21.05 (3.71)	22.06 (4.41)	*0.73*
rs174570				
Total cholesterol (mmol/l)	4.17 (0.71)	4.12 (0.71)	4.15 (0.73)	*0.37*
HDL (mmol/l)	1.43 (0.28)	1.42 (0.27)	1.46 (0.24)	*0.35*
LDL (mmol/l)	2.45 (0.64)	2.41 (0.61)	2.48 (0.50)	*0.76*
Triglyceride (mmol/l)	0.78 (0.37)	0.79 (0.40)	0.78 (0.34)	*0.55*
BMI (kg/m^2)	21.40 (3.80)	21.09 (3.56)	20.05 (3.61)	*0.22*
rs174572				
Total cholesterol (mmol/l)	4.19 (0.71)	4.11 (0.70)	4.16 (0.73)	*0.14*
HDL (mmol/l)	1.43 (0.27)	1.43 (0.28)	1.40 (0.27)	*0.36*
LDL (mmol/l)	2.45 (0.64)	2.41 (0.60)	2.54 (0.70)	*0.89*
Triglyceride (mmol/l)	0.79 (0.37)	0.77 (0.38)	0.79 (0.35)	*0.58*
BMI (kg/m^2)	21.36 (3.70)	21.19 (3.78)	21.75 (4.12)	*0.75*
rs2072114				
Total cholesterol (mmol/l)	4.17 (0.71)	4.07 (0.70)	4.49 (0.90)	*0.40*
HDL (mmol/l)	1.44 (0.28)	1.39 (0.25)	1.42 (0.33)	*0.02*
LDL (mmol/l)	2.44 (0.64)	2.42 (0.61)	2.53 (0.61)	*0.93*
Triglyceride (mmol/l)	0.78 (0.37)	0.79 (0.40)	0.98 (0.51)	*0.08*
BMI (kg/m^2)	21.4 (3.80)	20.93 (3.36)	21.64 (5.35)	*0.71*
rs174589				
Total cholesterol (mmol/l)	4.18 (0.71)	4.10 (0.69)	4.22 (0.73)	*0.27*
HDL (mmol/l)	1.43 (0.28)	1.43 (0.27)	1.43 (0.26)	*0.94*
LDL (mmol/l)	2.45 (0.63)	2.40 (0.61)	2.57 (0.71)	*0.92*
Triglyceride (mmol/l)	0.79 (0.38)	0.76 (0.35)	0.76 (0.33)	*0.45*
BMI (kg/m^2)	21.40 (3.73)	21.21 (3.79)	21.35 (3.76)	*0.44*

Supplementary Table 3 (continued). Lipids levels and BMI according to genotypes.

	11	12	22	p^*
rs174602				
Total cholesterol (mmol/l)	4.15 (0.69)	4.17 (0.75)	4.21 (0.77)	*0.29*
HDL (mmol/l)	1.42 (0.27)	1.43 (0.29)	1.46 (0.26)	*0.15*
LDL (mmol/l)	2.43 (0.63)	2.47 (0.64)	2.43 (0.61)	*0.52*
Triglyceride (mmol/l)	0.78 (0.37)	0.79 (0.40)	0.75 (0.33)	*0.91*
BMI (kg/m^2)	21.31 (3.75)	21.29 (3.70)	21.65 (4.05)	*0.86*
rs498793				
Total cholesterol (mmol/l)	4.16 (0.74)	4.14 (0.69)	4.20 (0.69)	*0.62*
HDL (mmol/l)	1.43 (0.28)	1.43 (0.27)	1.43 (0.28)	*1.00*
LDL (mmol/l)	2.43 (0.63)	2.44 (0.63)	2.46 (0.63)	*0.56*
Triglyceride (mmol/l)	0.78 (0.35)	0.78 (0.37)	0.78 (0.44)	*0.96*
BMI (kg/m^2)	21.13 (3.43)	21.48 (4.09)	21.32 (3.43)	*0.55*
rs526126				
Total cholesterol (mmol/l)	4.15 (0.69)	4.18 (0.73)	4.12 (0.75)	*0.88*
HDL (mmol/l)	1.42 (0.27)	1.45 (0.28)	1.43 (0.28)	*0.17*
LDL (mmol/l)	2.45 (0.63)	2.44 (0.63)	2.41 (0.65)	*0.37*
Triglyceride (mmol/l)	0.80 (0.39)	0.76 (0.34)	0.74 (0.39)	*0.05*
BMI (kg/m^2)	21.26 (3.57)	21.39 (4.04)	21.54 (3.98)	*0.46*
rs174611				
Total cholesterol (mmol/l)	4.16 (0.70)	4.14 (0.71)	4.23 (0.77)	*0.84*
HDL (mmol/l)	1.43 (0.28)	1.44 (0.27)	1.41 (0.29)	*0.98*
LDL (mmol/l)	2.44 (0.62)	2.43 (0.63)	2.57 (0.69)	*0.51*
Triglyceride (mmol/l)	0.79 (0.38)	0.77 (0.38)	0.82 (0.36)	*0.61*
BMI (kg/m^2)	21.39 (3.74)	21.05 (3.60)	22.40 (4.48)	*0.32*
rs174616				
Total cholesterol (mmol/l)	4.19 (0.69)	4.13 (0.69)	4.18 (0.78)	*0.88*
HDL (mmol/l)	1.43 (0.28)	1.43 (0.28)	1.41 (0.27)	*0.99*
LDL (mmol/l)	2.45 (0.59)	2.41 (0.63)	2.50 (0.68)	*0.47*
Triglyceride (mmol/l)	0.79 (0.38)	0.77 (0.38)	0.80 (0.36)	*0.96*
BMI (kg/m^2)	21.24 (3.67)	21.09 (3.55)	21.91 (4.20)	*0.10*

Major allele : 1, minor allele : 2. Data are means (S.D). p value is for trend. *p values were adjusted for age, gender, BMI and center.

Supplementary Table 4. Haplotype characteristics for 11-locus and 7-locus haplotypes

	rs174546	rs968567	rs174570	rs174572	rs2072114	rs174589	rs174602	rs498793	rs526126	rs174611	rs174616	Frequency
11-locus haplotypes												
Haplo. 1	C	C	C	C	A	C	T	**C**	C	T	G	0.272
Haplo. 2	C	C	C	C	A	C	T	T	C	T	G	0.158
Haplo. 3	C	C	C	C	A	C	T	T	C	T	**A**	0.091
Haplo. 4	**T**	**T**	C	**T**	A	**T**	T	T	**G**	**C**	**A**	0.056
Haplo. 5	**T**	C	**T**	C	**G**	C	T	T	C	**C**	**A**	0.026
Haplo. 6	**T**	C	**T**	**T**	A	**T**	**C**	T	**G**	**C**	**A**	0.019
Haplo. 7	C	C	C	C	A	C	T	T	**G**	**C**	**A**	0.019
Haplo. 8	**T**	**T**	C	**T**	A	**T**	**C**	T	C	**C**	**A**	0.019
Haplo. 9	C	C	C	C	A	C	**C**	T	C	T	**A**	0.018
Haplo. 10	C	C	C	C	A	C	T	**C**	C	T	**A**	0.018
Haplo. 11	**T**	**T**	C	**T**	A	**T**	T	**C**	**G**	**C**	**A**	0.016
Haplo. 12	**T**	C	**T**	C	**G**	C	T	T	C	T	G	0.016
Haplo. 13	C	C	C	C	A	C	T	T	C	**C**	**A**	0.014
Haplo. 14	**T**	**T**	C	**T**	A	**T**	**C**	T	**G**	**C**	**A**	0.014
Haplo. 15	C	C	C	C	A	C	**C**	T	C	T	G	0.013
Haplo. 16	C	C	C	C	A	C	**C**	**C**	C	T	G	0.011
Haplo. 17	C	C	C	C	A	C	**C**	T	**G**	**C**	**A**	0.010
Haplo. 18	C	C	C	C	A	C	**C**	T	**G**	T	**A**	0.010
7-locus haplotypes												
Haplo. 1	C	C	-	-	-	-	T	**C**	C	T	G	0.270
Haplo. 2	C	C	-	-	-	-	T	T	C	T	G	0.157
Haplo. 3	C	C	-	-	-	-	T	T	C	T	**A**	0.090
Haplo. 4	**T**	**T**	-	-	-	-	T	T	**G**	**C**	**A**	0.058
Haplo. 5	**T**	C	-	-	-	-	T	T	C	**C**	**A**	0.033
Haplo. 6	**T**	C	-	-	-	-	**C**	T	**G**	**C**	**A**	0.022
Haplo. 7	C	C	-	-	-	-	T	T	**G**	**C**	**A**	0.020
Haplo. 8	**T**	**T**	-	-	-	-	**C**	T	C	**C**	**A**	0.021
Haplo. 9	C	C	-	-	-	-	**C**	T	C	T	**A**	0.022
Haplo. 10	C	C	-	-	-	-	T	**C**	C	T	**A**	0.020
Haplo. 11	**T**	**T**	-	-	-	-	T	**C**	**G**	**C**	**A**	0.015
Haplo. 12	**T**	C	-	-	-	-	T	T	C	T	G	0.013
Haplo. 13	C	C	-	-	-	-	T	T	C	**C**	**A**	0.016
Haplo. 14	**T**	**T**	-	-	-	-	**C**	T	**G**	**C**	**A**	0.012
Haplo. 15	C	C	-	-	-	-	**C**	T	C	T	G	0.014
Haplo. 16	C	C	-	-	-	-	**C**	**C**	C	T	G	0.011
Haplo. 17	C	C	-	-	-	-	**C**	T	**G**	**C**	**A**	0.011
Haplo. 18	C	C	-	-	-	-	**C**	T	**G**	T	**A**	0.011

Minor alleles are underlined.

Supplementary Table 5. Systematic exploration of haplotype association between the 7HtSNPs within FADS1-FADS2 and C18:2(n-6), C20:4(n-6), D6D and D5D activities

Variable	Model	AIC*	#par†	SNP number; SNPs
C18:2n-6	**1**	**0.000**	**10**	**3; 1 2 3**
	2	5.878	7	2; 1 2
	3	6.257	8	2; 1 3
	4	7.071	14	4; 1 2 3 5
	117	70.896	6	1; 4
	118	71.006	6	1; 5
	119	71.450	8	2; 4 5
	120	73.845	5	0; Chi-square= 83.845425 with 5 df
C20:4n-6	**1**	**0.000**	**7**	**2; 1 2**
	2	**1.041**	**10**	**3; 1 2 3**
	3	2.077	6	1; 1
	4	2.228	8	2; 1 6
	5	2.569	8	2; 1 3
	117	207.993	8	2; 4 5
	118	208.607	6	1; 5
	119	222.633	6	1; 4
	120	228.649	5	0; Chi-square= 232.648735 with 2 df
D6D	**1**	**0.000**	**11**	**3; 2 3 4**
	2	**1.124**	**8**	**2; 2 3**
	3	**1.709**	**10**	**3; 1 2 3**
	4	**1.872**	**13**	**5; 1 2 3 4 7**
	5	2.663	12	4; 1 2 3 4
	6	2.757	13	4; 2 3 4 7
	…			
	57	21.647	12	5; 1 2 3 4 5
	58	25.554	6	1; 3
	59	26.067	5	0; Chi-square= 38.066540 with 6 df
	60	26.213	8	2; 1 3
	61	26.298	8	2; 1 4
	119	36.759	13	4; 1 3 6 7
	120	36.924	12	4; 1 5 6 7
D5D	**1**	**0.000**	**7**	**2; 1 2**
	2	2.444	10	3; 1 2 6
	3	2.810	10	3; 1 2 4
	4	4.559	10	3; 1 2 3
	…			
	117	135.307	8	2; 4 5
	118	138.607	8	2; 3 4
	119	148.445	5	0; Chi-square= 152.445397 with 2 df
	120	149.409	6	1; 4

where 1 is rs174546, 2 is rs968567, 3 is rs174602, 4 is rs498793, 5 is rs526126, 6 is rs174611 and 7 is rs174616. *Re-scaled AIC. All models with a re-scaled AIC≤2 (in bold) could be considered as 'equivalent'. †Number of estimated regression parameters.