Supplementary Table 1. Postprandial response in serum lipids, apolipoprotein B48, proprotein convertase subtilisin/kexin type 9 and glucose.

	Controls, n = 14		FH, n = 13		p_{meal}	p_{group}
	SFA meal	PUFA meal	SFA meal	PUFA meal		
TG, mmol/L						
AUC	6.7 (5.4-9.6)	6.9 (6.0-10.0)	10.3 (7.0-11.8)	6.7 (6.1-9.1)	0.72	0.56
iAUC	2.2 (1.2-3.6)	2.1 (1.6-4.2)	2.0 (0.9-3.3)	1.9 (1.0-2.9)	0.36	0.25
Baseline	0.8 (0.7-1.0)	0.8 (0.6-1.2)	1.3 (0.8-1.7)	0.9 (0.7-1.3)		
2h	1.2 (0.9-1.6)	1.4 (1.1-1.8)	1.7 (1.1-1.9)	1.5 (1.2-1.7)		
4h	1.4 (0.9-1.8)	1.1 (1.0-1.8)	1.9 (1.2-2.2)	1.3 (1.0-1.8)		
6h	1.0 (0.8-1.5)	1.1 (0.9-1.4)	1.4 (1.0-1.7)	0.9 (0.8-1.3)		
Apo B48, µg/mL						
AUC	50.8 (33.1-60.2)	51.5 (31.5-68.7)	68.9 (42.1-83.7)	58.2 (40.9-63.9)	0.56	0.34
iAUC	19.5 (9.0-24.9)	15.5 (9.3-28.3)	12.7 (7.3-32.0)	13.7 (8.5-29.8)	0.79	0.83
Baseline	4.5 (4.0-7.1)	5.6 (3.9-7.6)	7.0 (6.2-8.3)	6.2 (5.6-7.1)		
2h	9.3 (4.9-11.5)	9.2 (8.0-11.0)	9.5 (9.0-13.4)	11.1 (8.7-12.6)		
4h	8.5 (5.3-10.7)	8.3 (4.6-12.3)	13.1 (6.7-16.2)	8.6 (5.5-10.4)		
6h	8.7 (5.9-11.6)	8.8 (6.0-11.6)	8.9 (7.8-12.1)	8.6 (6.9-9.7)		
PCSK9, ng/mL						
AUC	1014 (878-1256)	1046 (833-1258)	1250 (1038-1556)	1410 (1206-1531)	0.88	0.02
iAUC	-300 (-374--46)	-416 (-536--186)	-431 (-715--180)	-356 (-675--236)	0.13	0.40
Baseline	229 (202-267)	209 (184-330)	267 (233-376)	262 (224-334)		
4h	196 (185-223)	195 (168-261)	250 (205-304)	274 (239-296)		
6h	196 (171-264)	195 (172-221)	238 (201-270)	253 (236-346)		
Total cholesterol, mmol/L						
AUC	25.2 (23.9-26.7)	24.8 (22.2-26.8)	44.3 (37.4-50.4)	49.0 (39.8-53.5)	0.61	<0.001
iAUC	0.5 (-0.2-1.2)	0.2 (-0.2-0.8)	0.5 (-0.5-1.5)	0.5 (-0.3-1.4)	0.99	0.85
Baseline	4.1 (3.9-4.4)	4.1 (3.6-4.5)	7.2 (6.5-8.7)	7.9 (6.5-9.0)		
2h	4.2 (4.0-4.4)	4.1 (3.7-4.4)	7.2 (6.2-8.2)	8.0 (6.5-8.8)		
4h	4.3 (4.0-4.5)	4.2 (3.7-4.5)	7.4 (6.3-8.4)	8.0 (6.8-9.0)		
6h	4.3 (4.0-4.5)	4.2 (3.8-4.4)	7.5 (6.3-8.5)	8.2 (6.7-9.0)		
LDL cholesterol, mmol/L						
AUC	14.6 (11.6-17.8)	13.9 (11.1-16.3)	35.1 (30.5-43.8)	37.6 (33.0-44.4)	0.91	<0.001
iAUC	0.4 (-0.1-0.5)	-0.1 (-0.4-0.5)	0.1 (-0.8-0.9)	0.5 (-0.7-1.2)	0.56	0.95
Baseline	2.4 (1.8-2.9)	2.3 (1.8-2.8)	5.7 (5.3-7.4)	6.3 (5.4-7.5)		
2h	2.4 (2.0-2.9)	2.3 (1.8-2.8)	5.9 (5.0-7.3)	6.2 (5.4-7.2)		
4h	2.5 (2.0-2.9)	2.3 (1.9-2.7)	5.9 (5.2-7.4)	6.2 (5.6-7.5)		
6h	2.5 (1.9-3.1)	2.4 (1.8-2.7)	5.8 (5.2-7.3)	6.5 (5.7-7.5)		
HDL cholesterol, mmol/L						

AUC	9.1 (7.5-10.7)	8.3 (6.6-11.2)	8.5 (7.3-9.5)	8.5 (7.9-9.4)	0.96	0.55
iAUC	0.1 (-0.3-0.4)	0.0 (-0.3-0.1)	0.0 (-0.5-0.4)	0.0 (-0.2-0.3)	0.72	0.47
Baseline	1.5 (1.2-1.7)	1.4 (1.1-1.9)	1.4 (1.3-1.6)	1.4 (1.3-1.6)		
2h	1.5 (1.3-1.7)	1.4 (1.1-1.8)	1.4 (1.2-1.6)	1.5 (1.3-1.5)		
4h	1.6 (1.3-1.8)	1.4 (1.1-1.8)	1.4 (1.2-1.5)	1.4 (1.4-1.6)		
6h	1.5 (1.3-1.8)	1.4 (1.1-1.9)	1.4 (1.2-1.7)	1.5 (1.4-1.7)		
Glucose. mmol/L						
AUC	25.5 (22.7-27.4)	25.2 (23.7-26.5)	27.3 (25.5-28.4)	26.5 (24.8-27.8)	0.20	0.08
iAUC	-2.2 (-3.8--1.3)	-2.0 (-3.4--0.9)	-2.0 (-2.3--1.3)	-2.6 (-3.7--0.9)	0.72	0.57
Baseline	4.8 (4.5-4.8)	4.5 (4.3-4.8)	4.9 (4.3-5.1)	4.8 (4.4-5.0)		
2h	3.7 (3.2-4.4)	4.0 (3.3-4.2)	4.2 (4.1-4.6)	3.9 (3.4-4.6)		
4h	4.4 (4.2-4.6)	4.3 (4.2-4.5)	4.6 (4.3-4.7)	4.5 (4.3-4.8)		
6h	4.5 (4.1-4.6)	4.4 (4.2-4.6)	4.5 (4.3-4.9)	4.5 (4.1-4.6)		

Results are presented as median (interquartile range). p-values from analysis of total and incremental area under the curve (AUC and iAUC) in a linear mixed model for repeated measures. FH, familial hypercholesterolemia; SFA, saturated fatty acid; PUFA, polyunsaturated fatty acid; p_{meal}, p-value SFA vs PUFA meal; p_{group}, p-value FH vs controls; TG, triglycerides; Apo, apolipoprotein; PCSK9, proprotein convertase subtilisin/kexin type 9; LDL, low-density lipoprotein; HDL, high-density lipoprotein.

Supplementary Table 2. Postprandial response in the concentration and triglyceride content of lipoprotein subclasses.

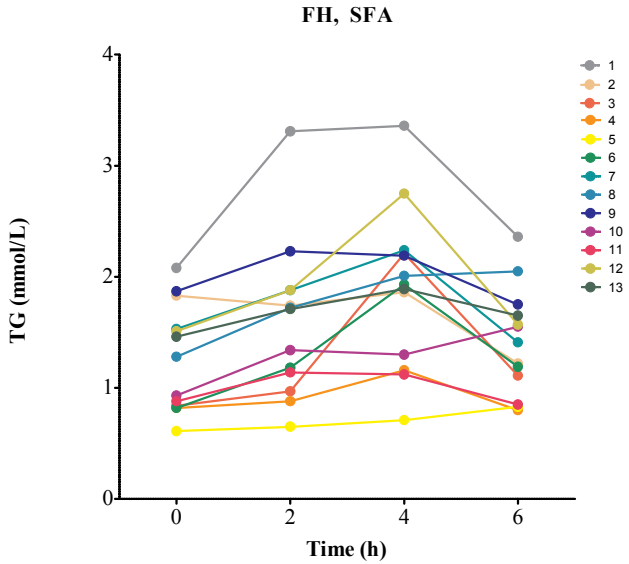
	Total concentration				Triglyceride content			
	AUC		iAUC		AUC		iAUC	
	p_{meal}	p_{group}	p_{meal}	p_{group}	p_{meal}	p_{group}	p_{meal}	p_{group}
Total VDLD	0.23	<0.001*	0.97	0.13	0.34	0.15	0.75	0.26
XXL VLDL	0.03†	0.009*	0.01†	0.62	0.03†	0.01*	0.01†	0.76
XL VLDL	0.17	0.09	0.24	0.48	0.17	0.13	0.33	0.46
L VLDL	0.41	0.18	0.89	0.25	0.45	0.27	0.83	0.21
M VLDL	0.45	0.06	0.35	0.26	0.45	0.24	0.41	0.24
S VLDL	0.32	0.001*	0.34	0.29	0.08 (FH) 0.36 (C)	0.04* (SFA) 0.66 (PUFA)	0.37	0.24
XS VLDL	0.10	<0.001*	0.003†	0.16	0.05† (FH) 0.42 (C)	0.002* (SFA) 0.03* (PUFA)	0.17 (FH) 0.05‡ (C)	0.11 (SFA) 0.11 (PUFA)
IDL + total LDL	0.70	<0.001*	0.09	0.61	0.32	<0.001*	0.001† (FH) 0.96 (C)	0.003* (SFA) 0.17 (PUFA)
IDL	0.96	<0.001*	0.57	0.33	0.22	<0.001*	0.003†	0.48
L LDL	0.76	<0.001*	0.27	0.26	0.16	<0.001*	<0.001† (FH) 0.83 (C)	0.01* (SFA) 0.14 (PUFA)
M LDL	0.55	<0.001*	0.01‡	0.20	0.78	<0.001*	0.001† (FH) 0.10 (C)	<0.001* (SFA) 0.63 (PUFA)
S LDL	0.60	<0.001*	0.01‡	0.18	0.70	<0.001*	0.05† (FH) 0.14 (C)	0.02* (SFA) 0.33 (PUFA)
Total HDL	0.94	0.42	0.71	0.85	0.04† (FH) 0.57 (C)	0.001* (SFA) 0.10 (PUFA)	0.10	0.17
XL HDL	0.77	0.002*	<0.001†	0.83	0.008†	<0.001*	<0.001†	0.51
L HDL	0.65	0.45	0.004†	0.95	0.08† (FH) 0.26 (C)	0.02* (SFA) 0.33 (PUFA)	0.71	0.61
M HDL	0.80	0.17	0.07 (FH) 0.10 (C)	0.72 (SFA) 0.01** (PUFA)	0.68	0.13	0.69	0.19
S HDL	0.80	0.22	0.80 (FH) 0.001‡ (C)	0.55 (SFA) 0.02** (PUFA)	0.04† (FH) 0.74 (C)	0.15 (SFA) 0.70 (PUFA)	0.96	0.04**

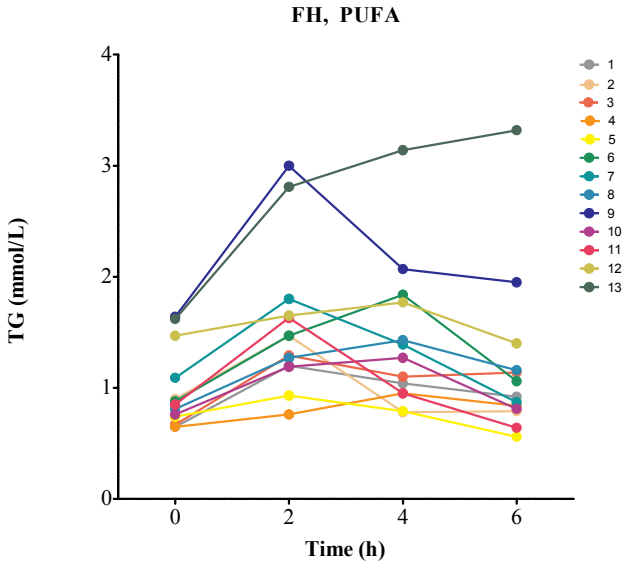
Results are presented as p-values from analysis of total and incremental area under the curve (AUC and iAUC) in a linear mixed model for repeated measures. When significant interaction was found between group and meal, p-values are presented stratified by group and meal. P_{meal}, p-value SFA vs PUFA meal; p_{group}, p-value FH vs controls; SFA, saturated fatty acid; PUFA, polyunsaturated fatty acid; FH, familial hypercholesterolemia; C, controls; VLDL, very low-density lipoprotein; IDL, intermediate-density lipoprotein; LDL, low-density lipoprotein; HDL, high-density lipoprotein; *FH>controls; **controls>FH; †SFA>PUFA; ‡PUFA>SFA. FH n=13; controls n=14.

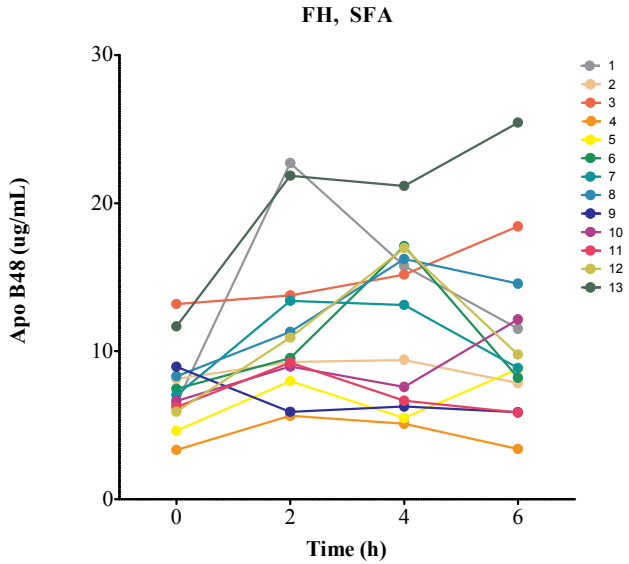
Supplementary Table 3. Correlations between circulating proprotein convertase subtilisin/kexin type 9 and lipids.

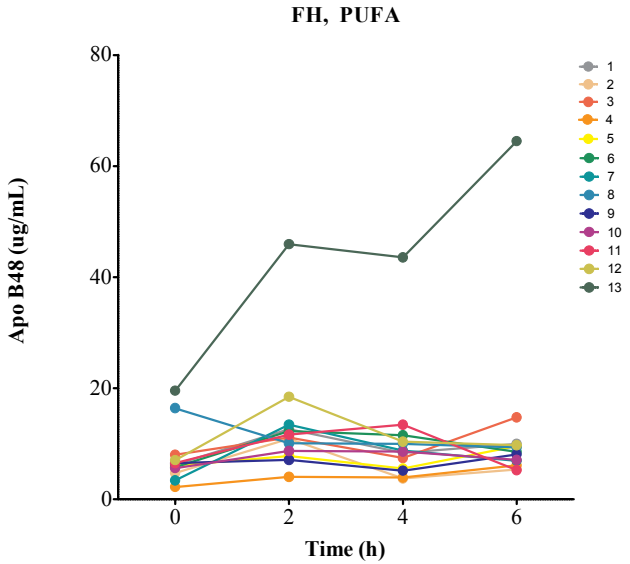
	PCSK9 AUC				PCSK9 iAUC			
	Controls		FH		Controls		FH	
	r	p	r	p	r	p	r	p
TG	-0.24	0.22	-0.12	0.56	-0.18	0.35	0.18	0.38
Total cholesterol	0.36	0.06	0.18	0.37	0.13	0.51	-0.18	0.38
LDL cholesterol	0.34	0.08	0.24	0.24	0.19	0.33	-0.27	0.19
Apo B48	-0.16	0.41	-0.34	0.09	-0.26	0.18	-0.16	0.43
VLDL particle concentration	0.07	0.72	-0.07	0.75	0.51	0.006	0.34	0.09
IDL particle concentration	0.44	0.02	0.15	0.46	0.00	0.99	-0.21	0.30

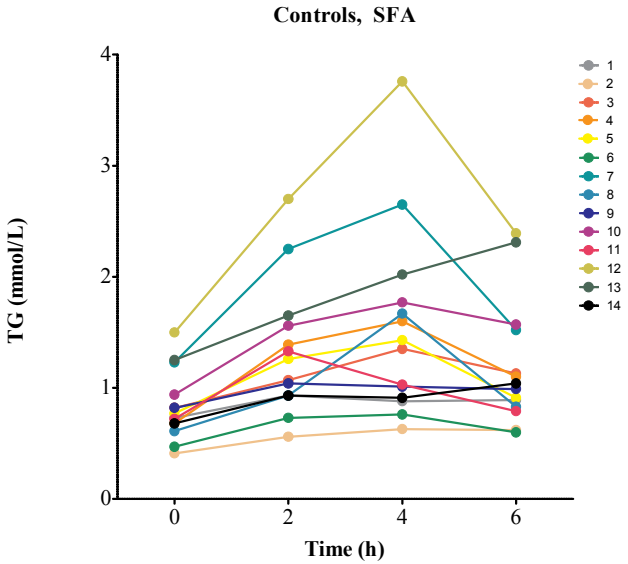
Spearman rank correlation coefficient, r. PCSK9, proprotein convertase subtilisin/kexin type 9; AUC, area under the curve; iAUC, incremental area under the curve; FH, familial hypercholesterolemia; TG, triglycerides; LDL, low-density lipoprotein; Apo, apolipoprotein; VLDL, very low-density lipoprotein; IDL, intermediate-density lipoprotein.

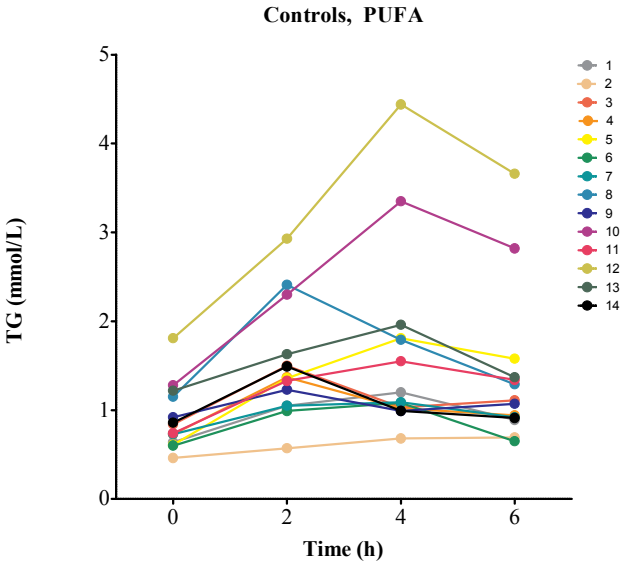

FH, SFA
TG (mmol/L)
Time (h)
0
1
2
3
4
0
2
4
6
1
2
3
4
5
6
7
8
9
10
11
12
13

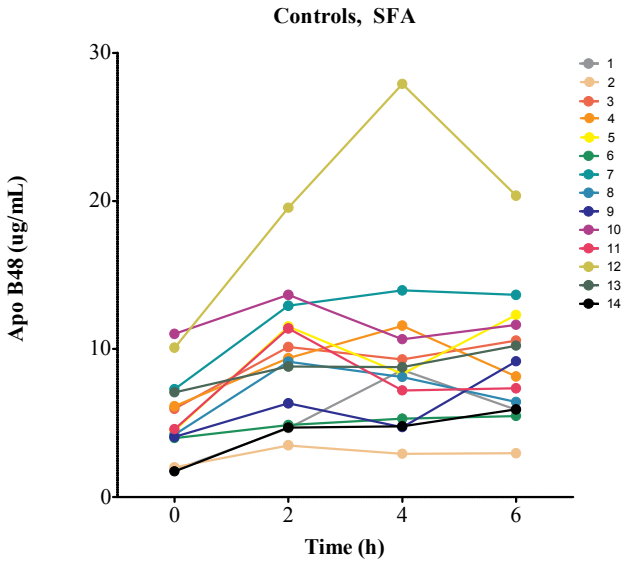

FH, PUFA
TG (mmol/L)
Time (h)
0
1
2
3
4
0
2
4
6
1
2
3
4
5
6
7
8
9
10
11
12
13

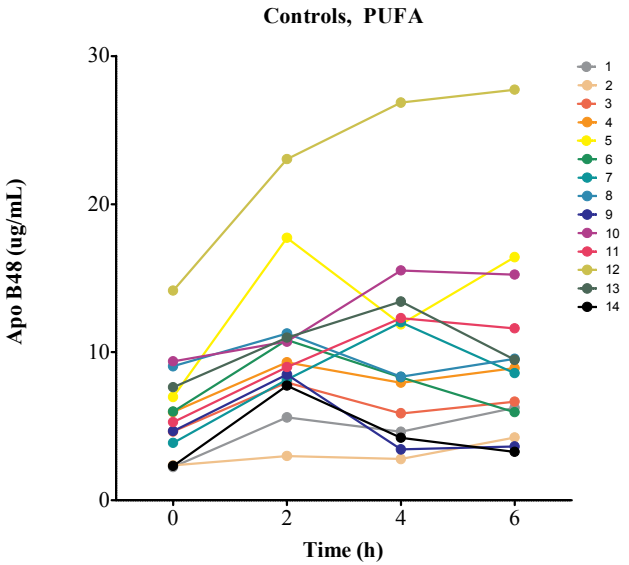

FH, SFA
Apo B48 (ug/mL)
Time (h)
0
10
20
30
0
2
4
6
1
2
3
4
5
6
7
8
9
10
11
12
13


FH, PUFA
Apo B48 (ug/mL)
Time (h)
0
20
40
60
80
0
2
4
6
1
2
3
4
5
6
7
8
9
10
11
12
13

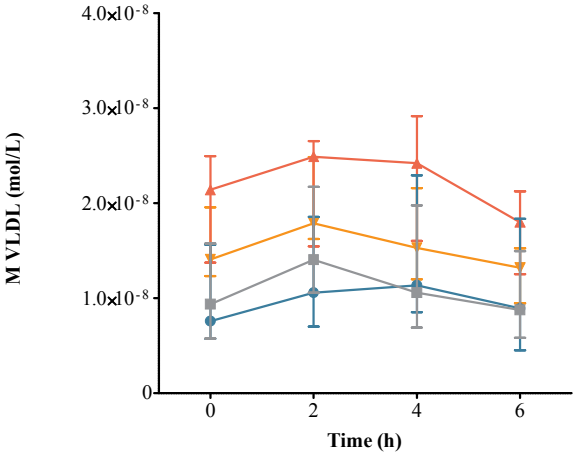

Controls, SFA
TG (mmol/L)
Time (h)
0
1
2
3
4
0
2
4
6
1
2
3
4
5
6
7
8
9
10
11
12
13
14

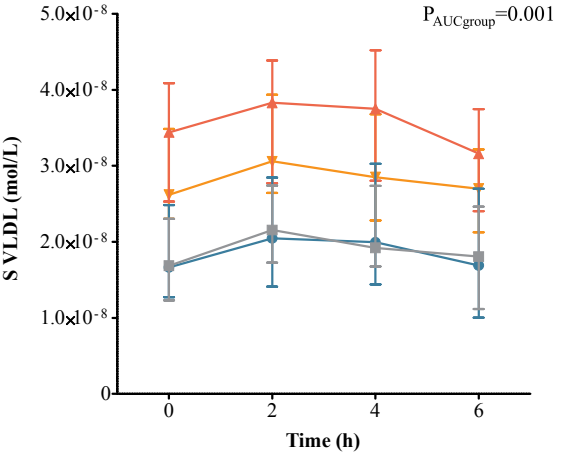

Controls, PUFA
TG (mmol/L)
Time (h)
0
1
2
3
4
5
0
2
4
6
1
2
3
4
5
6
7
8
9
10
11
12
13
14

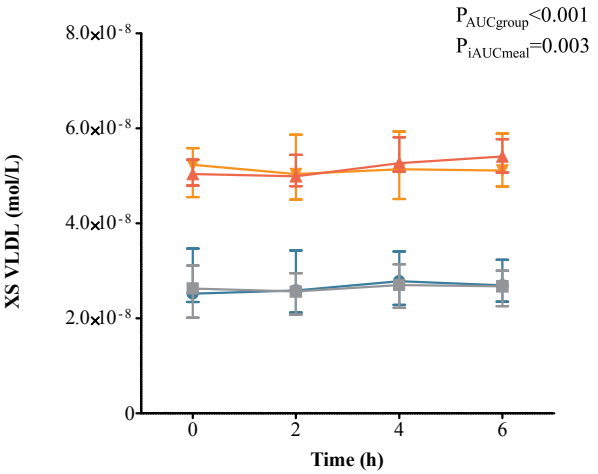

Controls, SFA
Apo B48 (ug/mL)
Time (h)
0
10
20
30
0
2
4
6
1
2
3
4
5
6
7
8
9
10
11
12
13
14

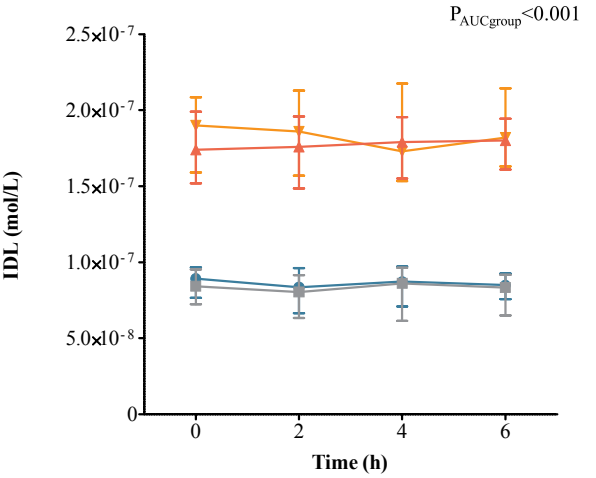

Controls, PUFA
Apo B48 (ug/mL)
Time (h)
0
10
20
30
0
2
4
6
1
2
3
4
5
6
7
8
9
10
11
12
13
14

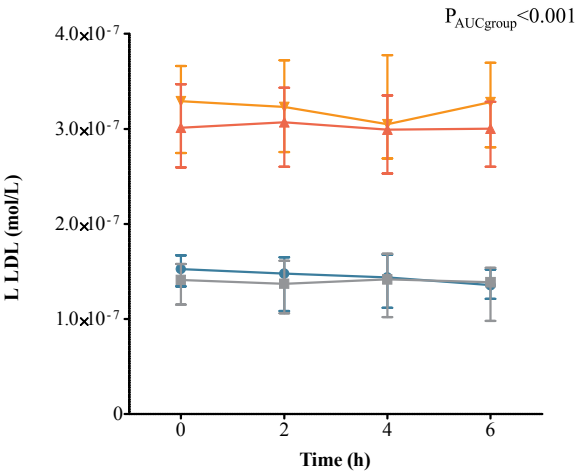
Supplementary Figure 1. Postprandial response in triglycerides and apolipoprotein B48 (individual curves). TG, triglycerides; Apo, apolipoprotein; FH, familial hypercholesterolemia; SFA, saturated fatty acid; PUFA, polyunsaturated fatty acid.

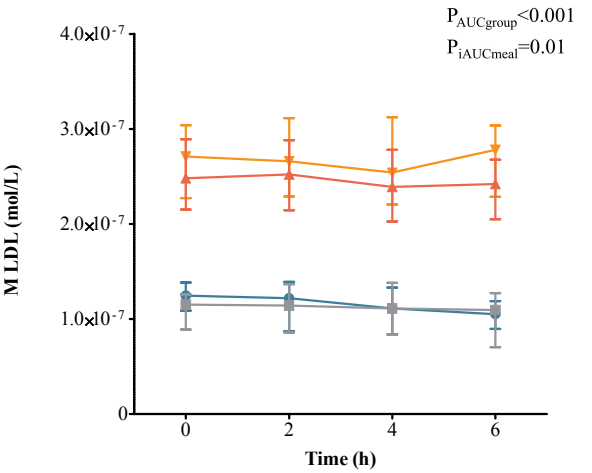

M VLDL (mol/L)
4.0x10-8
3.0x10-8
2.0x10-8
1.0x10-8
0
0
2
4
6
Time (h)

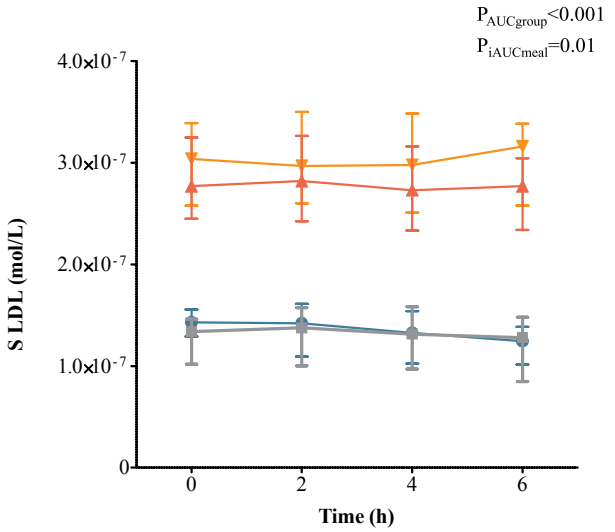

PAUCgroup=0.001
S VLDL (mol/L)
5.0x10-8
4.0x10-8
3.0x10-8
2.0x10-8
1.0x10-8
0
0
2
4
6
Time (h)

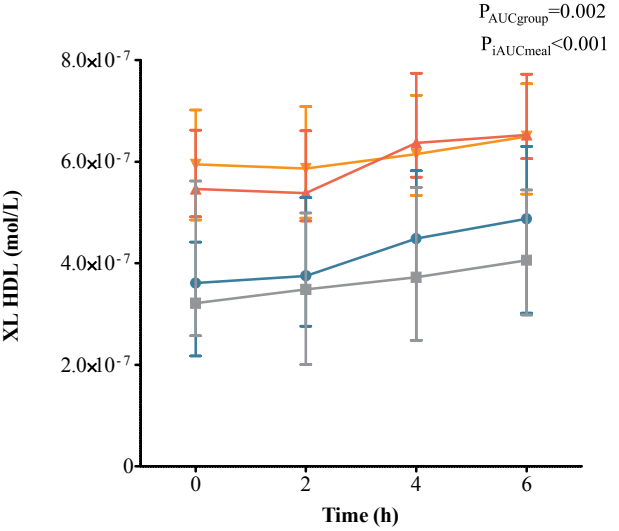

PAUCgroup<0.001
PiAUCmeal=0.003
XS VLDL (mol/L)
8.0x10-8
6.0x10-8
4.0x10-8
2.0x10-8
0
0
2
4
6
Time (h)

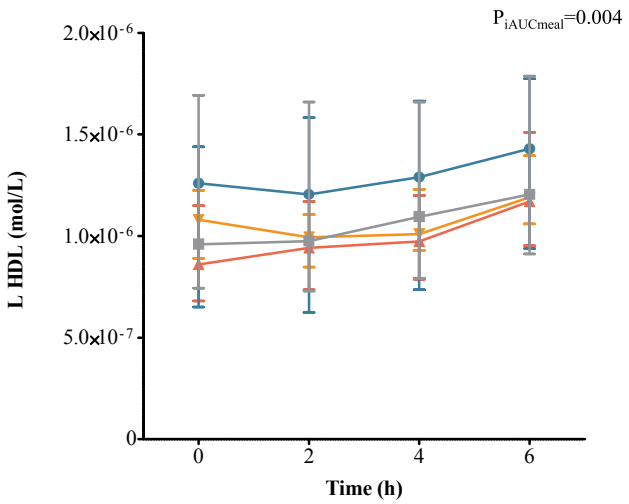

PAUCgroup<0.001
IDL (mol/L)
2.5x10-7
2.0x10-7
1.5x10-7
1.0x10-7
5.0x10-8
0
0
2
4
6
Time (h)

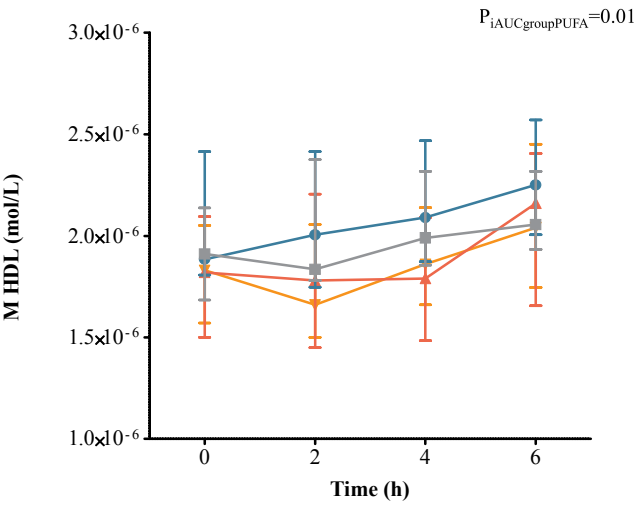

PAUCgroup<0.001
L LDL (mol/L)
4.0x10-7
3.0x10-7
2.0x10-7
1.0x10-7
0
0
2
4
6
Time (h)

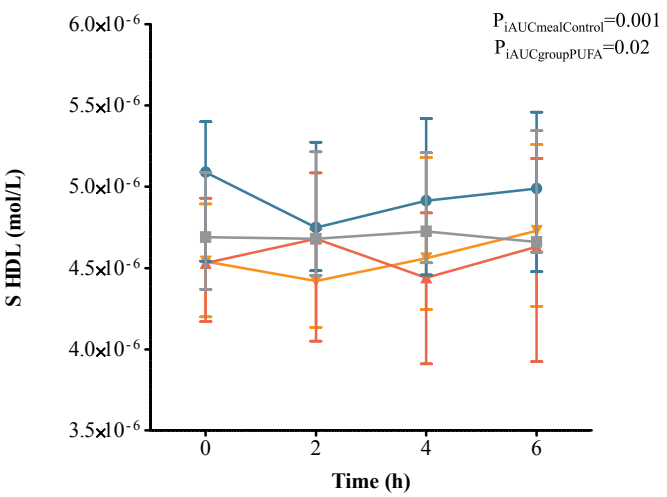

PAUCgroup<0.001
PiAUCmeal=0.01
M LDL (mol/L)
4.0x10-7
3.0x10-7
2.0x10-7
1.0x10-7
0
0
2
4
6
Time (h)


$P_{AUCgroup}$<0.001
$P_{iAUCmeal}$=0.01
S LDL (mol/L)
4.0x10-7
3.0x10-7
2.0x10-7
1.0x10-7
0
0
2
4
6
Time (h)


$P_{AUCgroup}$=0.002
$P_{iAUCmeal}$<0.001
XL HDL (mol/L)
8.0x10-7
6.0x10-7
4.0x10-7
2.0x10-7
0
0
2
4
6
Time (h)


$P_{iAUCmeal}$=0.004
L HDL (mol/L)
2.0x10-6
1.5x10-6
1.0x10-6
5.0x10-7
0
0
2
4
6
Time (h)


$P_{iAUCgroupPUFA}$=0.01
M HDL (mol/L)
3.0x10-6
2.5x10-6
2.0x10-6
1.5x10-6
1.0x10-6
0
2
4
6
Time (h)


$P_{iAUCmealControl}$=0.001
$P_{iAUCgroupPUFA}$=0.02
S HDL (mol/L)
6.0x10-6
5.5x10-6
5.0x10-6
4.5x10-6
4.0x10-6
3.5x10-6
0
2
4
6
Time (h)

Supplementary Figure 2. Postprandial response in the total concentration of lipoprotein subclasses. Results are presented as median (interquartile range). p-values from analysis of total and incremental area under the curve (AUC and iAUC) in a linear mixed model for repeated measures. VLDL, very low-density lipoprotein; IDL, intermediate low-density lipoprotein; LDL, low-density lipoprotein; HDL, high-density lipoprotein; SFA, saturated fatty acid; PUFA, polyunsaturated fatty acid; FH, familial hypercholesterolemia; p_{meal}, p-value SFA vs PUFA meal; p_{group}, p-value FH vs controls. Red line=FH, SFA; orange line=FH, PUFA; blue line=controls, SFA; grey line=controls, PUFA.