SUPPLEMENTAL TABLES

Supplementary Table 1. Family Sizes

Sibship Size	# of Sibships	# of Siblings
1	1701[a]	1701[a]
2	317	634
3	131	393
4	38	152
5	7	35
6	7	42
7	1	7
Total	2202	2964

[a] Included 275 participants from Omni cohort, where pedigree data was not available.

Supplementary Table 2. Percent Composition of Red Blood Cell Fatty Acids

Variable, Mean (SD)	All N=3196	Offspring N=2899	Omni N=297	t-test P-value[a]
Myristic, C14:0	0.31(0.08)	0.31 (0.08)	0.32 (0.11)	**0.0017**
Palmitic, C16:0	21.29(1.24)	21.28 (1.24)	21.45 (1.17)	0.026
Stearic, C18:0	18.11(0.95)	18.10 (0.95)	18.19 (0.99)	0.15
Lignoceric, C24:0	0.43(0.16)	0.42 (0.16)	0.49 (0.14)	**<0.0001**
Palmitoleic, C16:1	0.35(0.19)	0.36 (0.19)	0.29 (0.17)	**<0.0001**
Oleic, C18:1	13.88(1.06)	13.91 (1.04)	13.50 (1.17)	**<0.0001**
Eicosenoic, C20:1	0.27(0.11)	0.28 (0.11)	0.23 (0.04)	**<0.0001**
Nervonic, C24:1	0.45(0.15)	0.45 (0.15)	0.46 (0.14)	0.17
trans Oleic, C18:1 trans	1.62(0.55)	1.65 (0.55)	1.27 (0.41)	**<0.0001**
trans Linoleic, C18:2 trans	0.25(0.08)	0.25 (0.08)	0.19 (0.05)	**<0.0001**
trans Palmitoleic, C16:1 trans	0.17(0.05)	0.17 (0.05)	0.15 (0.04)	**<0.0001**
Linoleic, C18:2n6	11.19(1.74)	11.13 (1.71)	11.78 (1.92)	**<0.0001**
gamma-Linolenic, C18:3n6	0.08(0.09)	0.08 (0.10)	0.08 (0.04)	0.34
Eicosadienoic, C20:2n6	0.28(0.05)	0.28 (0.05)	0.31 (0.06)	**<0.0001**
Eicosatrienoic, C20:3n6	1.59(0.36)	1.60 (0.36)	1.52 (0.30)	**0.0002**
Arachidonic, C20:4n6	16.78(1.62)	16.79 (1.60)	16.62 (1.78)	0.088
Docosatetraenoic, C22:4n6	3.76(0.83)	3.79 (0.82)	3.48 (0.86)	**<0.0001**
Docosapentaenoic, C22:5n6	0.66(0.19)	0.66 (0.19)	0.61 (0.19)	**<0.0001**
alpha-Linolenic, C18:3n3	0.19(0.10)	0.18 (0.11)	0.20 (0.08)	0.013
Eicosapentaenoic (EPA), C20:5n3	0.74(0.46)	0.73 (0.46)	0.80 (0.47)	0.013
Docosapentaenoic, C22:5n3	2.74(0.46)	2.75 (0.46)	2.71 (0.46)	0.13
Docosahexaenoic (DHA), C22:6n3	4.88(1.38)	4.83 (1.36)	5.36 (1.49)	**<0.0001**
Omega-3 Index (EPA+DHA)[b]	5.62(1.71)	5.56 (1.69)	6.16 (1.83)	**<0.0001**

[a] For testing differences between the two cohorts the critical level alpha was set to 0.05 / 23 fatty acids = 0.0022 for statistical significance using Bonferroni correction (shown in **bold**); [b] The omega-3 index of those participants who did not report fish oil supplementation was 5.34 (1.54)% in the Offspring cohort (n=2591) and 6.10 (1.82)% in the Omni cohort (n=283) (P>0.0001).

Supplementary Table 3. Clinical correlates for individual n-3 fatty acids (N=2964)

	EPA	95% CI			DHA	95% CI		
Variables	**Exp(Est)[a]**	**Lower**	**Upper**	**P-value[b]**	**Exp(Est)[a]**	**Lower**	**Upper**	**P-value[b]**
Age (10 years)[c]	1.03	1.01	1.05	**0.0008**	1.05	1.04	1.06	**<0.0001**
Sex (Female)[c]	1.03	0.99	1.06	0.11	1.06	1.04	1.08	**<0.0001**
White[c]	0.89	0.83	0.94	**0.0001**	0.89	0.85	0.92	**<0.0001**
Highest Education[c]: Graduate or Professional	1.20	1.14	1.25	**<0.0001**	1.10	1.08	1.14	**<0.0001**
Associate/Bachelor	1.13	1.09	1.17	**<0.0001**	1.09	1.06	1.11	**<0.0001**
Grade 12 (Reference)	1.00	-	-	-	1.00	-	-	-
Grades <12	0.92	0.86	0.99	0.026	0.93	0.88	0.97	0.0018
Fish Oil Supplementation	1.80	1.71	1.89	**<0.0001**	1.29	1.25	1.32	**<0.0001**
HDL Cholesterol (1 SD = 18 mg/100ml)	1.07	1.05	1.09	**<0.0001**	0.97	0.96	0.98	**<0.0001**
LDL Cholesterol (1 SD = 32 mg/100ml)	1.06	1.04	1.07	**<0.0001**	1.02	1.00	1.03	0.0073
Lipid Pharmacotherapy	1.11	1.07	1.15	**<0.0001**	1.06	1.03	1.08	**<0.0001**
1-2 Drinks / Day[d]	1.11	1.07	1.16	**<0.0001**		e		
Heart Rate (1 SD = 10 bpm)	0.97	0.96	0.99	**0.0001**	0.98	0.97	0.99	**<0.0001**
Waist Girth at Umbilicus (1 SD = 5.8 in)	0.97	0.96	0.99	**0.0003**	0.98	0.97	0.99	**0.0001**
Aspirin (3+ / week)	1.05	1.01	1.08	0.0040	1.04	1.01	1.06	**0.0008**
Current Smoker		e			0.89	0.86	0.92	**<0.0001**
Ln[Triglycerides] (1 SD)		e			0.97	0.95	0.98	**<0.0001**

[a] Represents the proportional change in fatty acid per 1 SD (continuous) or presence vs. absence (categorical) covariate; e.g. a 1 SD increase in Heart Rate is associated with 3% lower levels of EPA; [b] The critical level alpha was set to 0.05/25 clinical factors = 0.002 for statistical significance using Bonferroni correction (shown in **bold**); [c] Forced into model; [d] Indicator variable for females > 7 drinks/week, males > 14 drinks/week. [e] Variable was not selected into the model.

Supplementary Table 4. Clinical correlates for individual n-3 fatty acids (N=2964)

	DPA	95% CI			ALA	95% CI		
Variables	**Exp(Est)[a]**	**Lower**	**Upper**	**P-value[b]**	**Exp(Est)[a]**	**Lower**	**Upper**	**P-value[b]**
Age (10 years)[c]	1.00	1.00	1.01	0.53	1.02	1.00	1.04	0.050
Sex (Female)[c]	0.96	0.95	0.97	**<0.0001**	1.08	1.05	1.12	**<0.0001**
White[c]	1.01	0.99	1.03	0.41	0.89	0.86	0.93	**<0.0001**
Highest Education[c]: Graduate or Professional	1.02	1.01	1.04	**0.0025**	1.01	0.98	1.05	0.47
Associate/Bachelor	1.00	0.99	1.02	0.58	1.04	1.01	1.08	0.022
Grade 12 (Reference)	1.00	-	-	-	1.00	-	-	-
Grades <12	0.98	0.95	1.01	0.18	1.02	0.95	1.09	0.62
Fish Oil Supplementation	1.17	1.15	1.19	**<0.0001**			[e]	
HDL Cholesterol (1 SD = 18 mg/100ml)	1.01	1.00	1.02	**0.0036**	1.05	1.03	1.07	**<0.0001**
LDL Cholesterol (1 SD = 32 mg/100ml)			[e]				[e]	
Lipid Pharmacotherapy			[e]		0.93	0.90	0.96	**<0.0001**
1-2 Drinks / Day[d]			[e]				[e]	
Heart Rate (1 SD = 10 bpm)			[e]				[e]	
Waist Girth at Umbilicus (1 SD = 5.8 in)	0.99	0.98	1.00	**0.0004**	0.97	0.96	0.99	**0.0002**
Aspirin (3+ / week)			[e]				[e]	
Current Smoker	0.97	0.95	0.99	**0.0012**			[e]	
Ln[Triglycerides] (1 SD)			[e]		1.05	1.03	1.07	**<0.0001**

[a] Represents the proportional change in fatty acid per 1 SD (continuous) or presence vs. absence (categorical) covariate; e.g. a 1 SD increase in HDL-C is associated with 5% higher levels of ALA; [b] The critical level alpha was set to 0.05 / 25 clinical factors = 0.002 for statistical significance using Bonferroni correction (shown in **bold**); [c] Forced into model; [d] Indicator variable for females > 7 drinks/week, males > 14 drinks/week. [e] Variable was not selected into the model.

Supplementary Table 5. Mediating Effects of Dietary EPA+DHA on RBC EPA+DHA in Offspring Cohort

	Without Dietary Intake (1 Replicate)			With Dietary Intake (1 Replicate)			Bootstrapping 99.64% CI (1000 Replicates)		
Variable (N=2182)	**Est.[a]**	**SE**	**P-value**	**Est.[a]**	**SE**	**P-value**	**Diff. Est.**	**Lower**	**Upper**
Age (10 years)[b]	0.042	0.007	<.0001	0.034	0.006	<.0001	0.009	-0.003	0.022
Sex (Female)[b]	0.049	0.013	0.0003	0.053	0.011	<.0001	-0.006	-0.038	0.026
Highest Education[b]:									
Graduate or Professional	**0.109**	**0.016**	**<.0001**	**0.057**	**0.014**	**<.0001**	**0.040**	**0.011**	**0.069**
Associate/Bachelor	**0.084**	**0.013**	**<.0001**	**0.052**	**0.011**	**<.0001**	**0.027**	**0.000**	**0.056**
Grade 12 (Reference)	0.000	-	-	0.000	-	-		n/a	
Grades <12	-0.081	0.033	0.0148	-0.026	0.032	0.41	-0.054	-0.113	0.026
Fish Oil Supplementation	**0.311**	**0.016**	**<.0001**	**0.178**	**0.018**	**<.0001**	**0.126**	**0.091**	**0.160**
HDL Cholesterol (1 SD = 18 mg/dL)	-0.013	0.008	0.0922	-0.016	0.006	0.016	0.003	-0.013	0.019
LDL Cholesterol (1 SD = 32 mg/dL)	0.013	0.007	0.0505	0.004	0.006	0.50	0.008	-0.005	0.020
Lipid Pharmacotherapy	0.060	0.014	<.0001	0.046	0.011	<.0001	0.009	-0.017	0.034
Heart Rate (1 SD = 10 bpm)	-0.020	0.005	0.0003	-0.012	0.005	0.0072	-0.006	-0.016	0.006
Waist Girth at Umbilicus (1 SD = 5.8 in)	-0.024	0.006	0.0002	-0.021	0.005	<.0001	-0.005	-0.020	0.012
Aspirin (3+ / week)	0.036	0.012	0.0024	0.027	0.010	0.0070	0.011	-0.014	0.033
Current Smoker	-0.126	0.021	<.0001	-0.116	0.019	<.0001	-0.017	-0.060	0.020
Ln[Triglycerides] (1 SD)	-0.023	0.007	0.0006	-0.014	0.006	0.021	-0.006	-0.018	0.009
Ln[Dietary Intake] (1 SD)		n/a		0.149	0.006	<.0001		n/a	

Significant *mediation effects* are shown in **bold;** Maximum Likelihood (not REML) was used to compare these fixed effects;
[a] Represents the change in log fatty acid per 1 SD (continuous) or presence vs. absence (categorical) covariate; [b] Forced into model.