

Online supplemental material

Supplementary Table 1: Demographics of sample in adjusted analyses (N=2659)

	N	%
Gender (male)	1367	51.41%
Multiple births	11	0.41%
Multiparity	1543	58.03%
Smokers	455	17.11%
	Mean	SD
Gestational age (wks)	39.53	1.60
Maternal age (yrs)	28.56	4.77
Maternal BMI (kg/m ²)	22.95	3.75
Family adversity	1.21	1.55
Storage time (days)	2.84	1.96
Maternal diet		
Meat	5.16	2.97
Fish	1.96	1.73
Cheese & eggs	4.70	2.73

The sample reflects those subjects where genetic data was present for at least one polymorphism and present for all 8 demographic variables, storage time at 4°C and 81 measures of maternal diet in pregnancy. Three examples of the maternal diet are given in the table based upon 10 questions reported as portions per week. Maternal age reflected the age at birth of the ALSPAC child. Maternal BMI was derived from self-reported pre-pregnancy weight and height. The family adversity score was calculated from 18 items of adversity including teenage pregnancy, low education, financial hardship, poor living conditions, partner conflict, substance abuse, maternal anxiety or depressive symptoms and criminal behavior of either parent.

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Supplementary Table 2: Minor allele frequencies for the 17 polymorphisms

SNP	Minor Allele	Mothers			Children		
		N	Frequency	HWE	N	Frequency	HWE
rs174548	C	7835	30.56%	0.083	8468	30.31%	0.675
rs174556	A	7802	29.90%	0.049	8451	29.62%	0.444
rs174561	G	7824	29.73%	0.070	8478	29.56%	0.298
rs3834458	Deletion	7834	33.12%	0.339	8477	33.00%	0.995
rs968567	T	7973	17.03%	0.272	8655	16.93%	0.758
rs174570	T	7868	12.79%	0.001	8487	12.58%	0.969
rs174574	A	7839	34.14%	0.183	8471	33.97%	0.877
rs2727271	T	7850	11.73%	0.379	8485	11.64%	0.910
rs174576	A	7722	34.30%	0.196	8447	33.97%	0.554
rs174578	A	7846	34.32%	0.092	8477	34.02%	0.556
rs174579	T	7833	21.53%	<0.001	8461	21.40%	<0.001
rs174602	G	7874	20.29%	0.319	8507	20.35%	0.330
rs498793	T	7837	39.44%	0.144	8426	39.88%	0.547
rs526126	G	7869	18.16%	0.790	8485	18.14%	0.778
rs174448	C	7900	36.15%	0.596	8497	35.85%	0.352
rs174449	C	7867	35.16%	0.785	8478	35.10%	0.973
rs174455	C	7862	34.51%	0.209	8498	34.78%	0.607

Data restricted to mothers and children of white ethnic origin. N denotes the number of mothers and children genotyped rather than the number of subjects used for association with fatty acid levels in the main analyses.

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Supplementary Table 3: Regression coefficients from analyses of log n-6 and n-3 fatty acid levels as a percentage of total fatty acid levels on maternal *FADS* SNPs.

	FADS1			intergenic		FADS2	
	rs174548	rs174556	rs174561	rs3834458	rs968567	rs174570	rs174574
<i>Omega-6</i>							
18:2	0.220 (0.029)***	0.223 (0.030)***	0.225 (0.030)***	0.255 (0.029)***	0.105 (0.035)**	0.284 (0.040)***	0.259 (0.028)***
18:3	0.028 (0.031)	0.019 (0.031)	0.026 (0.031)	0.022 (0.030)	0.037 (0.037)	-0.031 (0.042)	0.021 (0.030)
20:2	0.196 (0.030)***	0.187 (0.030)***	0.204 (0.030)***	0.204 (0.030)***	0.070 (0.036)	0.248 (0.041)***	0.216 (0.029)***
20:3	0.423 (0.029)***	0.435 (0.029)***	0.444 (0.030)***	0.426 (0.029)***	0.387 (0.035)***	0.244 (0.041)***	0.423 (0.028)***
20:4	-0.186 (0.030)***	-0.183 (0.030)***	-0.183 (0.030)***	-0.195 (0.030)***	-0.132 (0.036)***	-0.169 (0.041)***	-0.189 (0.029)***
22:4	-0.109 (0.030)***	-0.114 (0.030)***	-0.108 (0.030)***	-0.120 (0.030)***	-0.108 (0.036)**	-0.053 (0.041)	-0.110 (0.029)***
22:5	-0.067 (0.031)*	-0.073 (0.031)*	-0.064 (0.031)*	-0.084 (0.030)**	-0.041 (0.036)	-0.085 (0.042)*	-0.073 (0.030)*
20:3/18:2	0.246 (0.030)***	0.255 (0.030)***	0.263 (0.030)***	0.221 (0.030)***	0.301 (0.035)***	0.018 (0.042)	0.215 (0.029)***
20:4/20:3	-0.689 (0.027)***	-0.697 (0.027)***	-0.706 (0.027)***	-0.703 (0.026)***	-0.578 (0.034)***	-0.478 (0.040)***	-0.692 (0.026)***
20:4/18:2	-0.329 (0.030)***	-0.329 (0.030)***	-0.329 (0.030)***	-0.361 (0.029)***	-0.200 (0.036)***	-0.353 (0.041)***	-0.358 (0.029)***
<i>Omega-3</i>							
18:3	0.079 (0.029)**	0.063 (0.030)*	0.064 (0.030)*	0.065 (0.029)*	0.014 (0.035)	0.065 (0.040)	0.073 (0.029)*
20:5	-0.044 (0.029)	-0.044 (0.029)	-0.039 (0.030)	-0.047 (0.029)	-0.083 (0.035)*	-0.035 (0.040)	-0.047 (0.028)
22:5	-0.003 (0.030)	-0.012 (0.030)	-0.006 (0.030)	-0.015 (0.029)	-0.076 (0.035)*	0.019 (0.041)	-0.008 (0.029)
22:6	-0.126 (0.030)***	-0.127 (0.030)***	-0.122 (0.030)***	-0.140 (0.029)***	-0.114 (0.035)**	-0.112 (0.041)**	-0.134 (0.029)***
20:5/18:3	-0.096 (0.029)**	-0.085 (0.029)**	-0.081 (0.030)**	-0.088 (0.029)**	-0.082 (0.035)*	-0.078 (0.040)	-0.094 (0.029)***
N	2446	2434	2440	2447	2491	2455	2449

* p<0.05, ** p<0.01, *** p<0.001. Fatty acids have been standardized to have a variance of one. Standard errors are reported in parentheses. Effect sizes are reported per copy of the minor allele.

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Supplementary Table 3: continued

	FADS2						
	rs2727271	rs174576	rs174578	rs174579	rs174602	rs498793	rs526126
<i>Omega-6</i>							
18:2	0.255 (0.044)***	0.249 (0.029)***	0.251 (0.028)***	0.172 (0.032)***	0.174 (0.034)***	-0.038 (0.028)	0.079 (0.036)*
18:3	-0.018 (0.046)	0.021 (0.031)	0.021 (0.030)	0.034 (0.034)	0.020 (0.036)	-0.024 (0.029)	0.046 (0.037)
20:2	0.262 (0.044)***	0.214 (0.030)***	0.217 (0.029)***	0.119 (0.033)***	0.145 (0.035)***	-0.059 (0.029)*	0.043 (0.036)
20:3	0.317 (0.045)***	0.417 (0.029)***	0.419 (0.028)***	0.362 (0.033)***	0.182 (0.035)***	-0.051 (0.029)	0.149 (0.036)***
20:4	-0.171 (0.044)***	-0.200 (0.030)***	-0.190 (0.029)***	-0.124 (0.033)***	-0.091 (0.035)**	0.116 (0.029)***	-0.133 (0.036)***
22:4	-0.066 (0.044)	-0.123 (0.030)***	-0.110 (0.029)***	-0.094 (0.033)**	-0.075 (0.035)*	0.059 (0.029)*	-0.109 (0.036)**
22:5	-0.070 (0.045)	-0.094 (0.030)**	-0.077 (0.030)**	-0.043 (0.034)	-0.025 (0.035)	0.047 (0.029)	-0.075 (0.037)*
20:3/18:2	0.114 (0.045)*	0.217 (0.030)***	0.218 (0.029)***	0.224 (0.033)***	0.043 (0.035)	-0.020 (0.029)	0.085 (0.036)*
20:4/20:3	-0.557 (0.043)***	-0.700 (0.026)***	-0.688 (0.026)***	-0.543 (0.031)***	-0.311 (0.034)***	0.206 (0.028)***	-0.330 (0.036)***
20:4/18:2	-0.336 (0.044)***	-0.362 (0.029)***	-0.352 (0.029)***	-0.236 (0.033)***	-0.204 (0.035)***	0.142 (0.029)***	-0.185 (0.036)***
<i>Omega-3</i>							
18:3	0.091 (0.043)*	0.066 (0.029)*	0.068 (0.029)*	0.021 (0.032)	0.051 (0.034)	-0.054 (0.028)	0.000 (0.035)
20:5	0.020 (0.043)	-0.052 (0.029)	-0.048 (0.028)	-0.071 (0.032)*	-0.030 (0.034)	0.043 (0.028)	-0.080 (0.035)*
22:5	0.096 (0.044)*	-0.017 (0.029)	-0.015 (0.029)	-0.073 (0.033)*	-0.009 (0.034)	0.030 (0.028)	-0.095 (0.036)**
22:6	-0.077 (0.044)	-0.147 (0.029)***	-0.140 (0.029)***	-0.122 (0.033)***	-0.060 (0.034)	0.072 (0.028)*	-0.134 (0.036)***
20:5/18:3	-0.051 (0.043)	-0.094 (0.029)**	-0.092 (0.028)**	-0.076 (0.032)*	-0.063 (0.034)	0.077 (0.028)**	-0.069 (0.035)
N	2450	2396	2451	2445	2459	2437	2464

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Supplementary Table 3: continued

	intergenic		FADS3
	rs174448	rs174449	rs174455
<i>Omega-6</i>			
18:2	0.175 (0.028)***	0.179 (0.029)***	0.147 (0.029)***
18:3	0.054 (0.030)	0.049 (0.030)	0.048 (0.030)
20:2	0.122 (0.029)***	0.127 (0.029)***	0.123 (0.030)***
20:3	0.292 (0.029)***	0.297 (0.029)***	0.251 (0.030)***
20:4	-0.116 (0.029)***	-0.119 (0.029)***	-0.118 (0.030)***
22:4	-0.060 (0.029)*	-0.063 (0.029)*	-0.055 (0.030)
22:5	-0.044 (0.030)	-0.045 (0.030)	-0.046 (0.030)
20:3/18:2	0.152 (0.029)***	0.153 (0.029)***	0.133 (0.030)***
20:4/20:3	-0.459 (0.027)***	-0.468 (0.028)***	-0.419 (0.028)***
20:4/18:2	-0.230 (0.029)***	-0.235 (0.029)***	-0.214 (0.029)***
<i>Omega-3</i>			
18:3	0.056 (0.028)*	0.057 (0.029)*	0.056 (0.029)
20:5	-0.058 (0.028)*	-0.058 (0.028)*	-0.034 (0.029)
22:5	-0.022 (0.029)	-0.014 (0.029)	0.010 (0.029)
22:6	-0.095 (0.029)***	-0.085 (0.029)**	-0.079 (0.029)**
20:5/18:3	-0.091 (0.028)**	-0.092 (0.029)**	-0.070 (0.029)*
N	2468	2456	2457

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Supplementary Table 4: Regression coefficients from analyses of log n-6 and n-3 fatty acid levels as a percentage of total fatty acid levels on child *FADS* SNPs.

	FADS1			intergenic		FADS2	
	rs174548	rs174556	rs174561	rs3834458	rs968567	rs174570	rs174574
<i>Omega-6</i>							
18:2	0.132 (0.028)***	0.133 (0.028)***	0.127 (0.028)***	0.153 (0.028)***	0.032 (0.034)	0.223 (0.040)***	0.148 (0.027)***
18:3	-0.016 (0.029)	-0.014 (0.029)	-0.016 (0.029)	-0.011 (0.029)	0.011 (0.035)	-0.034 (0.041)	-0.015 (0.029)
20:2	0.123 (0.027)***	0.116 (0.028)***	0.125 (0.028)***	0.121 (0.027)***	-0.001 (0.033)	0.211 (0.039)***	0.126 (0.027)***
20:3	0.488 (0.027)***	0.500 (0.027)***	0.495 (0.027)***	0.488 (0.027)***	0.430 (0.033)***	0.316 (0.040)***	0.476 (0.026)***
20:4	-0.247 (0.028)***	-0.242 (0.029)***	-0.244 (0.028)***	-0.253 (0.028)***	-0.165 (0.034)***	-0.257 (0.040)***	-0.255 (0.028)***
22:4	-0.161 (0.029)***	-0.159 (0.029)***	-0.160 (0.029)***	-0.166 (0.028)***	-0.136 (0.034)***	-0.133 (0.041)**	-0.164 (0.028)***
22:5	-0.125 (0.029)***	-0.127 (0.029)***	-0.126 (0.029)***	-0.132 (0.028)***	-0.028 (0.034)	-0.205 (0.041)***	-0.133 (0.028)***
20:3/18:2	0.380 (0.028)***	0.391 (0.028)***	0.391 (0.028)***	0.364 (0.027)***	0.401 (0.033)***	0.137 (0.041)***	0.355 (0.027)***
20:4/20:3	-0.836 (0.024)***	-0.843 (0.024)***	-0.840 (0.024)***	-0.844 (0.024)***	-0.668 (0.032)***	-0.669 (0.039)***	-0.834 (0.023)***
20:4/18:2	-0.335 (0.028)***	-0.330 (0.028)***	-0.328 (0.028)***	-0.354 (0.027)***	-0.187 (0.034)***	-0.403 (0.040)***	-0.353 (0.027)***
<i>Omega-3</i>							
18:3	0.089 (0.028)**	0.094 (0.028)***	0.100 (0.028)***	0.107 (0.028)***	0.035 (0.034)	0.142 (0.040)***	0.099 (0.028)***
20:5	-0.042 (0.029)	-0.035 (0.029)	-0.036 (0.029)	-0.035 (0.029)	-0.067 (0.035)	0.009 (0.041)	-0.043 (0.028)
22:5	-0.016 (0.029)	-0.011 (0.029)	-0.014 (0.029)	-0.010 (0.028)	-0.078 (0.034)*	0.077 (0.041)	-0.006 (0.028)
22:6	-0.121 (0.029)***	-0.114 (0.029)***	-0.116 (0.029)***	-0.121 (0.028)***	-0.095 (0.034)**	-0.098 (0.041)*	-0.121 (0.028)***
20:5/18:3	-0.102 (0.029)***	-0.100 (0.029)***	-0.105 (0.029)***	-0.109 (0.028)***	-0.084 (0.035)*	-0.097 (0.041)*	-0.110 (0.028)***
N	2827	2818	2837	2829	2876	2831	2826

* p<0.05, ** p<0.01, *** p<0.001. Fatty acids have been standardized to have a variance of one. Standard errors are reported in parentheses. Effect sizes are reported per copy of the minor allele.

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Supplementary Table 4: continued

	FADS2						
	rs2727271	rs174576	rs174578	rs174579	rs174602	rs498793	rs526126
<i>Omega-6</i>							
18:2	0.146 (0.041)***	0.150 (0.027)***	0.144 (0.027)***	0.090 (0.031)**	0.124 (0.032)***	-0.017 (0.027)	0.060 (0.033)
18:3	-0.009 (0.043)	-0.016 (0.028)	-0.017 (0.028)	0.005 (0.032)	-0.041 (0.033)	0.011 (0.028)	-0.025 (0.035)
20:2	0.219 (0.040)***	0.129 (0.027)***	0.123 (0.027)***	0.020 (0.030)	0.090 (0.031)**	-0.046 (0.026)	0.027 (0.033)
20:3	0.340 (0.041)***	0.477 (0.026)***	0.471 (0.026)***	0.391 (0.030)***	0.207 (0.032)***	-0.103 (0.027)***	0.168 (0.034)***
20:4	-0.253 (0.042)***	-0.252 (0.027)***	-0.256 (0.027)***	-0.168 (0.031)***	-0.096 (0.033)**	0.082 (0.027)**	-0.117 (0.034)***
22:4	-0.138 (0.042)**	-0.165 (0.028)***	-0.167 (0.028)***	-0.125 (0.031)***	-0.047 (0.033)	0.064 (0.027)*	-0.119 (0.034)***
22:5	-0.181 (0.042)***	-0.132 (0.028)***	-0.132 (0.028)***	-0.058 (0.031)	-0.061 (0.033)	0.059 (0.027)*	-0.076 (0.034)*
20:3/18:2	0.222 (0.042)***	0.355 (0.027)***	0.354 (0.027)***	0.317 (0.031)***	0.108 (0.033)***	-0.089 (0.027)**	0.119 (0.034)***
20:4/20:3	-0.688 (0.040)***	-0.832 (0.023)***	-0.831 (0.023)***	-0.631 (0.029)***	-0.344 (0.032)***	0.215 (0.027)***	-0.330 (0.034)***
20:4/18:2	-0.349 (0.041)***	-0.351 (0.027)***	-0.351 (0.027)***	-0.228 (0.031)***	-0.176 (0.032)***	0.093 (0.027)***	-0.157 (0.034)***
<i>Omega-3</i>							
18:3	0.157 (0.041)***	0.102 (0.027)***	0.101 (0.027)***	0.047 (0.031)	0.053 (0.032)	-0.061 (0.027)*	-0.000 (0.034)
20:5	0.007 (0.043)	-0.040 (0.028)	-0.040 (0.028)	-0.050 (0.032)	-0.014 (0.033)	-0.002 (0.028)	-0.053 (0.034)
22:5	0.041 (0.042)	-0.007 (0.028)	-0.011 (0.028)	-0.038 (0.031)	-0.003 (0.033)	0.007 (0.027)	-0.068 (0.034)*
22:6	-0.111 (0.042)**	-0.121 (0.028)***	-0.123 (0.028)***	-0.089 (0.031)**	-0.050 (0.033)	0.025 (0.027)	-0.081 (0.034)*
20:5/18:3	-0.110 (0.042)**	-0.110 (0.028)***	-0.109 (0.028)***	-0.077 (0.031)*	-0.051 (0.033)	0.044 (0.027)	-0.046 (0.034)
N	2833	2836	2823	2818	2839	2807	2822

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Supplementary Table 4: continued

	intergenic		FADS3
	rs174448	rs174449	rs174455
<i>Omega-6</i>			
18:2	0.100 (0.027)***	0.102 (0.027)***	0.101 (0.027)***
18:3	0.002 (0.028)	-0.004 (0.028)	-0.009 (0.028)
20:2	0.075 (0.026)**	0.077 (0.026)**	0.086 (0.027)**
20:3	0.294 (0.027)***	0.303 (0.027)***	0.278 (0.027)***
20:4	-0.184 (0.027)***	-0.182 (0.027)***	-0.156 (0.027)***
22:4	-0.139 (0.027)***	-0.131 (0.028)***	-0.098 (0.028)***
22:5	-0.130 (0.027)***	-0.123 (0.028)***	-0.095 (0.028)***
20:3/18:2	0.213 (0.027)***	0.220 (0.027)***	0.197 (0.027)***
20:4/20:3	-0.550 (0.025)***	-0.556 (0.026)***	-0.497 (0.026)***
20:4/18:2	-0.250 (0.027)***	-0.249 (0.027)***	-0.222 (0.027)***
<i>Omega-3</i>			
18:3	0.082 (0.027)**	0.091 (0.027)***	0.088 (0.027)**
20:5	-0.026 (0.028)	-0.027 (0.028)	-0.003 (0.028)
22:5	-0.025 (0.027)	-0.019 (0.028)	0.010 (0.028)
22:6	-0.097 (0.027)***	-0.088 (0.028)**	-0.066 (0.028)*
20:5/18:3	-0.084 (0.027)**	-0.091 (0.028)**	-0.067 (0.028)*
N	2838	2828	2837

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Supplementary Table 5: Haplotypes generated from a region of high LD for mother and offspring genotypes separately (rs174548 to rs174579)

Haplotype	Allele sequence ^a	Frequency (%)	
		Mother	Offspring
Hap1	11111X11111	66.15	66.19
Hap2	11121X21222	3.27	3.23
Hap3	22221X21222	1.55	1.65
Hap4	22221X22221	10.31	10.26
Hap5	22222X21222	15.45	15.34
Hap.rare ^b		3.26	3.34
N ^c		7778	8415

^a 1= major allele, 2= minor allele, X= unspecified allele (rs174570)

^b Haplotypes with frequency <1% (53 mother and 61 offspring haplotypes)

^c Numbers available with probability of assignment >0.9 and with white ethnic origin

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Supplementary Table 6: Unadjusted regression coefficients from analyses of standardised log n-6 and n-3 fatty acid levels as a percentage of total fatty acid levels on *FADS* haplotypes (rs174548 to rs174579)

(a) Maternal haplotypes (N=2416)

	Hap1	Hap2	Hap3	Hap4	Hap5	Hap.rare
<i>Omega-6</i>						
18:2	-0.236 (0.029)***	0.265 (0.073)***	0.250 (0.116)*	0.277 (0.046)***	0.096 (0.037)**	0.046 (0.077)
18:3	-0.015 (0.031)	-0.073 (0.077)	0.073 (0.121)	-0.034 (0.048)	0.058 (0.039)	-0.008 (0.080)
20:2	-0.201 (0.030)***	0.172 (0.074)*	0.221 (0.118)	0.262 (0.047)***	0.092 (0.038)*	-0.025 (0.078)
20:3	-0.399 (0.029)***	0.105 (0.075)	0.262 (0.119)*	0.295 (0.047)***	0.378 (0.037)***	0.067 (0.078)
20:4	0.203 (0.030)***	-0.141 (0.074)	0.018 (0.118)	-0.185 (0.047)***	-0.142 (0.037)***	-0.122 (0.078)
22:4	0.133 (0.030)***	-0.103 (0.074)	0.083 (0.118)	-0.080 (0.047)	-0.115 (0.037)**	-0.117 (0.078)
22:5	0.097 (0.030)**	-0.146 (0.076)	0.059 (0.120)	-0.095 (0.048)*	-0.041 (0.038)	-0.092 (0.079)
20:3/18:2	-0.209 (0.030)***	-0.105 (0.075)	0.063 (0.119)	0.074 (0.047)	0.299 (0.037)***	0.030 (0.078)
20:4/20:3	0.684 (0.026)***	-0.295 (0.074)***	-0.252 (0.117)*	-0.553 (0.045)***	-0.583 (0.035)***	-0.230 (0.077)**
20:4/18:2	0.357 (0.029)***	-0.313 (0.074)***	-0.142 (0.118)	-0.365 (0.047)***	-0.206 (0.037)***	-0.153 (0.078)
<i>Omega-3</i>						
18:3	-0.063 (0.029)*	0.025 (0.073)	0.024 (0.115)	0.122 (0.046)**	0.022 (0.037)	-0.034 (0.076)
20:5	0.057 (0.029)*	-0.044 (0.072)	0.094 (0.114)	0.029 (0.046)	-0.086 (0.036)*	-0.091 (0.075)
22:5	0.025 (0.029)	-0.070 (0.073)	0.107 (0.116)	0.098 (0.046)*	-0.094 (0.037)*	-0.001 (0.077)
22:6	0.150 (0.029)***	-0.146 (0.073)*	0.046 (0.116)	-0.085 (0.046)	-0.133 (0.037)***	-0.083 (0.077)
20:5/18:3	0.095 (0.029)***	-0.056 (0.072)	0.063 (0.115)	-0.065 (0.046)	-0.089 (0.036)*	-0.053 (0.076)

* p<0.05, ** p<0.01, *** p<0.001. Fatty acids and ratios have been standardized to have a variance of one. Standard errors are reported in parentheses. Effect sizes are reported per copy of the haplotype.

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Supplementary Table 6: continued

(b) Offspring haplotypes (N=2815)

	Hap1	Hap2	Hap3	Hap4	Hap5	Hap.rare
<i>Omega-6</i>						
18:2	-0.131 (0.027)***	0.201 (0.076)**	0.315 (0.094)***	0.167 (0.043)***	0.041 (0.035)	-0.089 (0.074)
18:3	0.008 (0.028)	-0.044 (0.079)	-0.068 (0.098)	-0.014 (0.045)	0.023 (0.036)	-0.036 (0.077)
20:2	-0.120 (0.027)***	0.096 (0.075)	0.068 (0.092)	0.238 (0.042)***	0.003 (0.034)	0.036 (0.073)
20:3	-0.447 (0.026)***	0.067 (0.077)	0.370 (0.095)***	0.337 (0.043)***	0.441 (0.035)***	0.041 (0.075)
20:4	0.257 (0.027)***	-0.161 (0.078)*	-0.183 (0.096)	-0.271 (0.044)***	-0.146 (0.036)***	-0.178 (0.076)*
22:4	0.171 (0.028)***	-0.087 (0.078)	-0.094 (0.096)	-0.156 (0.044)***	-0.122 (0.036)***	-0.116 (0.076)
22:5	0.132 (0.028)***	-0.098 (0.078)	-0.247 (0.096)*	-0.209 (0.044)***	-0.008 (0.036)	-0.074 (0.076)
20:3/18:2	-0.339 (0.027)***	-0.092 (0.078)	0.118 (0.096)	0.203 (0.044)***	0.405 (0.035)***	0.111 (0.076)
20:4/20:3	0.805 (0.023)***	-0.282 (0.078)***	-0.628 (0.095)***	-0.710 (0.042)***	-0.655 (0.034)***	-0.277 (0.075)***
20:4/18:2	0.344 (0.027)***	-0.292 (0.078)***	-0.387 (0.096)***	-0.381 (0.043)***	-0.174 (0.036)***	-0.123 (0.076)
<i>Omega-3</i>						
18:3	-0.094 (0.027)***	0.100 (0.077)	0.070 (0.095)	0.154 (0.043)***	0.030 (0.035)	-0.027 (0.075)
20:5	0.050 (0.028)	-0.022 (0.079)	0.111 (0.097)	0.000 (0.044)	-0.072 (0.036)*	-0.093 (0.077)
22:5	0.022 (0.028)	0.029 (0.078)	0.076 (0.096)	0.045 (0.044)	-0.061 (0.036)	-0.101 (0.075)
22:6	0.131 (0.028)***	-0.074 (0.078)	-0.062 (0.096)	-0.121 (0.044)**	-0.084 (0.036)*	-0.128 (0.076)
20:5/18:3	0.113 (0.028)***	-0.092 (0.079)	0.043 (0.097)	-0.114 (0.044)*	-0.084 (0.036)*	-0.059 (0.076)

* p<0.05, ** p<0.01, *** p<0.001. Fatty acids and ratios have been standardized to have a variance of one. Standard errors are reported in parentheses. Effect sizes are reported per copy of the haplotype.

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Supplementary Table 7: Bivariable regression coefficients from analyses of standardised log n-6 and n-3 fatty acid levels as a percentage of total fatty acid levels on *FADS* haplotypes (rs174548 to rs174579) (N=1902)

(a) Maternal haplotypes adjusted for offspring haplotypes

	Hap1	Hap2	Hap3	Hap4	Hap5	Hap.rare
<i>Omega-6</i>						
18:2	-0.202 (0.036)***	0.188 (0.093)*	0.133 (0.137)	0.222 (0.060)***	0.121 (0.049)*	0.077 (0.091)
18:3	-0.045 (0.039)	-0.023 (0.100)	0.100 (0.147)	0.020 (0.065)	0.026 (0.052)	0.086 (0.098)
20:2	-0.206 (0.036)***	0.225 (0.092)*	0.210 (0.135)	0.170 (0.059)**	0.171 (0.048)***	-0.016 (0.090)
20:3	-0.232 (0.035)***	0.115 (0.095)	0.149 (0.140)	0.154 (0.061)*	0.221 (0.048)***	-0.004 (0.093)
20:4	0.132 (0.037)***	-0.171 (0.096)	0.093 (0.142)	-0.099 (0.062)	-0.105 (0.050)*	-0.068 (0.094)
22:4	0.108 (0.037)**	-0.172 (0.096)	0.170 (0.142)	-0.059 (0.063)	-0.091 (0.050)	-0.090 (0.095)
22:5	0.055 (0.038)	-0.183 (0.098)	0.188 (0.143)	-0.004 (0.063)	-0.056 (0.051)	-0.070 (0.096)
20:3/18:2	-0.070 (0.037)	-0.034 (0.098)	0.043 (0.144)	-0.022 (0.064)	0.124 (0.050)*	-0.065 (0.096)
20:4/20:3	0.417 (0.030)***	-0.345 (0.095)***	-0.034 (0.140)	-0.291 (0.059)***	-0.371 (0.046)***	-0.084 (0.094)
20:4/18:2	0.263 (0.037)***	-0.293 (0.098)**	0.009 (0.144)	-0.242 (0.063)***	-0.184 (0.051)***	-0.118 (0.096)
<i>Omega-3</i>						
18:3	-0.026 (0.037)	0.066 (0.094)	-0.082 (0.138)	0.076 (0.061)	0.009 (0.049)	-0.077 (0.092)
20:5	0.055 (0.037)	0.039 (0.093)	0.047 (0.137)	0.029 (0.061)	-0.097 (0.049)*	-0.090 (0.092)
22:5	0.028 (0.037)	-0.088 (0.094)	0.104 (0.139)	0.055 (0.061)	-0.074 (0.049)	0.021 (0.093)
22:6	0.125 (0.037)***	-0.173 (0.095)	0.055 (0.139)	-0.053 (0.062)	-0.114 (0.049)*	-0.082 (0.093)
20:5/18:3	0.066 (0.037)	-0.015 (0.094)	0.101 (0.138)	-0.031 (0.061)	-0.090 (0.049)	-0.020 (0.092)

* p<0.05, ** p<0.01, *** p<0.001. Fatty acids and ratios have been standardized to have a variance of one. Standard errors are reported in parentheses. Effect sizes are reported per copy of the haplotype.

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Supplementary Table 7: continued

(b) Offspring haplotypes adjusted for mother haplotype

	Hap1	Hap2	Hap3	Hap4	Hap5	Hap.rare
<i>Omega-6</i>						
18:2	-0.047 (0.036)	0.136 (0.102)	0.274 (0.129)*	0.099 (0.058)	-0.039 (0.048)	-0.141 (0.099)
18:3	-0.008 (0.039)	-0.067 (0.110)	-0.097 (0.139)	-0.054 (0.063)	0.098 (0.052)	-0.107 (0.106)
20:2	-0.028 (0.036)	0.029 (0.101)	-0.076 (0.128)	0.177 (0.058)**	-0.100 (0.048)*	0.044 (0.098)
20:3	-0.342 (0.035)***	0.035 (0.105)	0.195 (0.132)	0.288 (0.059)***	0.306 (0.048)***	0.008 (0.101)
20:4	0.199 (0.037)***	0.020 (0.106)	-0.313 (0.134)*	-0.213 (0.060)***	-0.109 (0.050)*	-0.127 (0.103)
22:4	0.124 (0.038)**	0.122 (0.106)	-0.284 (0.134)*	-0.088 (0.061)	-0.114 (0.050)*	-0.040 (0.103)
22:5	0.117 (0.038)**	0.098 (0.108)	-0.457 (0.136)***	-0.219 (0.062)***	0.015 (0.051)	-0.084 (0.104)
20:3/18:2	-0.302 (0.038)***	-0.073 (0.108)	-0.023 (0.136)	0.207 (0.062)***	0.334 (0.050)***	0.120 (0.104)
20:4/20:3	0.621 (0.030)***	-0.010 (0.105)	-0.615 (0.133)***	-0.581 (0.057)***	-0.463 (0.046)***	-0.175 (0.102)
20:4/18:2	0.232 (0.037)***	-0.068 (0.108)	-0.492 (0.136)***	-0.279 (0.061)***	-0.084 (0.051)	-0.037 (0.105)
<i>Omega-3</i>						
18:3	-0.091 (0.037)*	-0.023 (0.103)	0.172 (0.130)	0.122 (0.059)*	0.030 (0.049)	0.062 (0.100)
20:5	0.018 (0.037)	-0.098 (0.103)	0.118 (0.130)	-0.004 (0.059)	-0.021 (0.049)	0.025 (0.100)
22:5	0.001 (0.037)	0.134 (0.104)	0.034 (0.131)	0.061 (0.060)	-0.058 (0.049)	-0.036 (0.101)
22:6	0.083 (0.037)*	0.065 (0.105)	-0.146 (0.132)	-0.068 (0.060)	-0.067 (0.049)	-0.029 (0.101)
20:5/18:3	0.083 (0.037)*	-0.066 (0.103)	-0.027 (0.131)	-0.094 (0.059)	-0.040 (0.049)	-0.025 (0.100)

* p<0.05, ** p<0.01, *** p<0.001. Fatty acids and ratios have been standardized to have a variance of one. Standard errors are reported in parentheses. Effect sizes are reported per copy of the haplotype.

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Supplementary Table 8: Haplotypes generated for all mother and offspring genotypes separately (rs174548 to rs174455)

Haplotype	Allele sequence ^a	Frequency (%)	
		Mother	Offspring
Hap1	1111111111111111	30.30	29.91
Hap2	1111111111111222	0.97	1.12
Hap3	1111111111121111	17.56	17.31
Hap4	1112122122221222	2.16	1.90
Hap5	22221122221221222	1.76	1.70
Hap6	2222122122221222	1.49	1.68
Hap7	2222122221111111	2.45	2.18
Hap8	2222122221111222	3.96	3.92
Hap9	2222122221121222	2.05	2.16
Hap10	2222212122211111	1.28	1.26
Hap11	2222212122211222	1.32	1.34
Hap12	2222212122212222	3.92	3.74
Hap13	2222212122212222	3.50	3.62
Hap14	22222121222211222	1.71	1.50
Hap.rare ^b		25.55	26.65
N ^c		5199	5543

^a 1= major allele, 2= minor allele

^b Haplotypes with frequency <1% (320 mother and 323 offspring haplotypes)

^c Numbers available with probability of assignment >0.5 and with white ethnic origin

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Supplementary Table 9: Regression coefficients from analyses of standardised log n-6 and n-3 fatty acid levels as a percentage of total fatty acid levels on *FADS* haplotype 1111111111121111

	Univariable		Bivariable	
	Mother	Offspring	Mother	Offspring
<i>Omega-6</i>				
18:2	-0.102 (0.033)**	-0.062 (0.030)*	-0.087 (0.043)*	-0.026 (0.043)
18:3	-0.064 (0.035)	-0.009 (0.032)	-0.098 (0.046)*	0.004 (0.047)
20:2	-0.117 (0.034)***	-0.106 (0.029)***	-0.133 (0.042)**	-0.077 (0.042)
20:3	-0.211 (0.034)***	-0.233 (0.030)***	-0.181 (0.043)***	-0.176 (0.043)***
20:4	0.129 (0.033)***	0.196 (0.030)***	0.037 (0.043)	0.198 (0.043)***
22:4	0.053 (0.033)	0.134 (0.031)***	-0.013 (0.044)	0.143 (0.044)**
22:5	0.042 (0.034)	0.121 (0.031)***	-0.034 (0.045)	0.139 (0.045)**
20:3/18:2	-0.129 (0.034)***	-0.183 (0.030)***	-0.111 (0.045)*	-0.154 (0.045)***
20:4/20:3	0.391 (0.032)***	0.502 (0.029)***	0.239 (0.041)***	0.445 (0.041)***
20:4/18:2	0.196 (0.033)***	0.237 (0.030)***	0.094 (0.044)*	0.217 (0.045)***
<i>Omega-3</i>				
18:3	-0.048 (0.033)	-0.082 (0.030)**	-0.020 (0.043)	-0.065 (0.044)
20:5	0.066 (0.033)*	0.056 (0.031)	0.032 (0.043)	0.044 (0.043)
22:5	0.023 (0.033)	0.033 (0.031)	-0.009 (0.044)	0.027 (0.044)
22:6	0.089 (0.033)**	0.113 (0.031)***	0.028 (0.043)	0.115 (0.044)**
20:5/18:3	0.092 (0.033)**	0.108 (0.031)***	0.042 (0.043)	0.085 (0.044)
N	2102	2427	1449	1449

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Supplementary Table 10: Comparison of haplotypes in regression analyses of standardised log fatty acids and ratios

(a) Maternal haplotypes (N=2416)

	Max (5df)	Hap1 (1df)		+Hap5 (2df)		+Hap4 (3df)	
	R2 (%)	R2 (%)	p	R2 (%)	p	R2 (%)	p
Omega-6							
18:2	3.29	2.69	0.005	3.03	0.089	3.08	0.077
18:3	0.15	0.01	0.505	0.10	0.796	0.11	0.608
20:2	2.43	1.88	0.009	2.05	0.025	2.22	0.077
20:3	7.86	7.31	0.006	7.56	0.050	7.75	0.237
20:4	2.00	1.92	0.732	1.92	0.603	1.96	0.600
22:4	0.92	0.82	0.681	0.83	0.559	0.83	0.357
22:5	0.55	0.43	0.555	0.48	0.602	0.48	0.395
20:4/18:2	6.30	5.90	0.036	6.10	0.158	6.21	0.312
20:3/18:2	3.06	2.01	<0.001	2.91	0.284	2.97	0.323
20:4/20:3	22.94	22.24	<0.001	22.42	0.001	22.92	0.734
Omega-3							
18:3	0.36	0.19	0.411	0.23	0.367	0.34	0.823
20:5	0.37	0.16	0.275	0.25	0.394	0.29	0.385
22:5	0.48	0.03	0.028	0.30	0.223	0.40	0.389
22:6	1.17	1.08	0.703	1.09	0.619	1.10	0.418
20:5/18:3	0.50	0.45	0.872	0.46	0.826	0.47	0.681
Global p			<0.001		0.037		0.581

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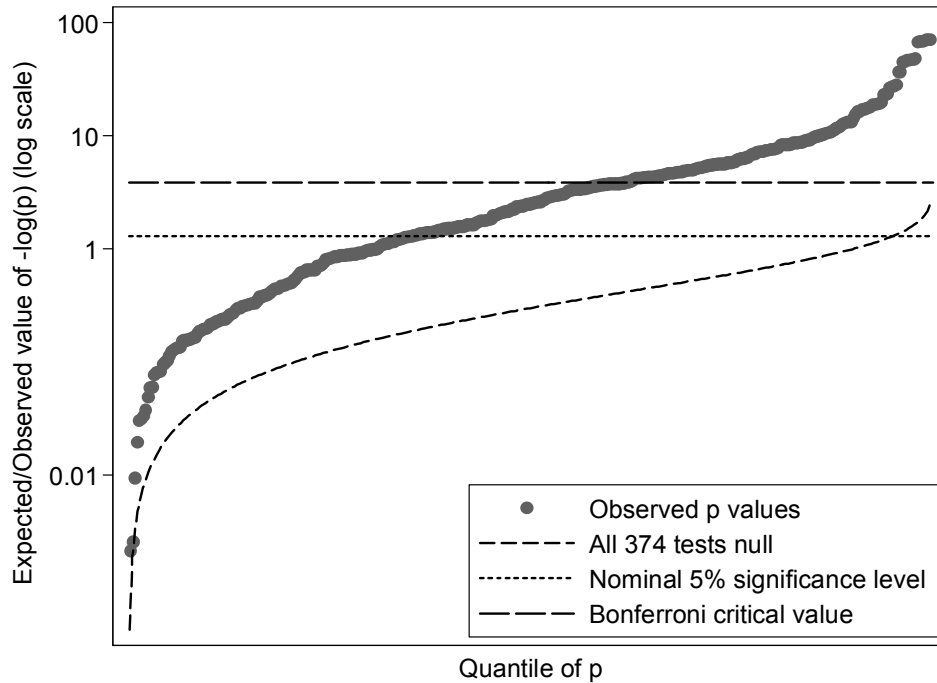
Supplementary Table 10: continued

(b) Offspring haplotypes (N=2815)

	Max (5df)	Hap1 (1df)		+Hap5 (2df)		+Hap4 (3df)		+Hap3 (4df)	
	R ² (%)	R ² (%)	p	R ² (%)	p	R ² (%)	p	R ² (%)	p
Omega-6									
18:2	1.54	0.83	<0.001	1.01	0.002	1.03	0.001	1.27	0.005
18:3	0.05	0.00	0.849	0.04	0.952	0.05	0.958	0.05	0.951
20:2	1.37	0.72	0.001	1.13	0.079	1.36	0.834	1.36	0.597
20:3	10.37	9.31	<0.001	9.65	<0.001	9.99	0.003	10.36	0.511
20:4	3.25	3.03	0.167	3.18	0.559	3.24	0.891	3.25	0.947
22:4	1.36	1.33	0.923	1.34	0.882	1.36	0.975	1.36	0.857
22:5	1.37	0.80	0.003	1.22	0.239	1.26	0.230	1.37	0.840
20:4/18:2	6.26	5.44	<0.001	5.89	0.011	6.00	0.021	6.16	0.083
20:3/18:2	6.46	5.28	<0.001	6.10	0.014	6.33	0.144	6.38	0.115
20:4/20:3	31.34	29.88	<0.001	29.88	<0.001	30.77	<0.001	31.33	0.497
Omega-3									
18:3	0.66	0.42	0.146	0.51	0.244	0.60	0.440	0.61	0.235
20:5	0.25	0.11	0.416	0.16	0.461	0.16	0.282	0.24	0.556
22:5	0.21	0.02	0.252	0.11	0.394	0.13	0.304	0.17	0.257
22:6	0.82	0.79	0.923	0.81	0.943	0.81	0.889	0.81	0.655
20:5/18:3	0.64	0.57	0.749	0.57	0.595	0.60	0.615	0.63	0.723
Global p			<0.001		<0.001		<0.001		0.509

The maximum R² was derived from a model including the 5 minor haplotypes Hap2 to Hap.rare. Subsequent columns reflect a series of models with Hap1, Hap5, Hap4 and Hap3 sequentially added to the null model. P values reflect a test of equal coefficients in the maximum model for haplotypes not included in the sequential model or in other words a test of the difference in R² between the two non-nested models. Global p values reflect a multivariate test across all 15 outcomes taking account of their inter-correlations.

Supplementary Figure 1: Q-Q plot of 374 univariable genetic comparisons (11 fatty acid outcomes x 17 genetic variants x mother/offspring) reported in Supplementary Tables 3 and 4.



The graph shows the distribution of the observed ranked p values (least significant to most highly significant) and the expected distribution if all 374 comparisons were null. At the 5% level, 242 (65%) results were significant while, using the Bonferroni adjustment, 143 (38%) were significant. The FDR criterion will always lie between these two extremes with its precise value depending on the observed distribution. For these data, the FDR criterion was calculated as 0.0302.

