**Online supplementary material**

**OSM Table 1.** Erythrocyte fatty acid composition at 9 months of age**⃰**

|  |  |  |
| --- | --- | --- |
|  | Mean | SD |
| Saturated fatty acids | 34.51  | 1.75 |
| Monounsaturated fatty acids | 15.25  | 0.88 |
| Polyunsaturated fatty acids | 41.99  | 2.13 |
|  *n*-6 polyunsaturated fatty acids | 32.73  | 1.92 |
|  C18:2*n*-6 linoleic acid | 10.95  | 1.08 |
|  C20:3*n*-6 | 1.42 | 0.29 |
|  C20:4*n*-6 arachidonic acid | 16.03  | 1.49 |
|  C22:4*n*-6 | 3.10  | 0.48 |
|  C22:5*n*-6 | 0.95  | 0.86 |
|  *n*-3 polyunsaturated fatty acids | 9.27  | 1.20 |
|  C18:3*n*-3 α-linolenic acid | 0.15  | 0.09 |
|  *n*-3 long-chain polyunsaturated fatty acids | 9.12  | 1.20 |
|  C20:5*n*-3 eicosapentaenoic acid | 0.60  | 0.24 |
|  C22:5*n*-3 | 1.98  | 0.35 |
|  C22:6*n*-3 docosahexaenoic acid | 6.54  | 0.97 |
| Ratio *n*-6/*n*-3 polyunsaturated fatty acids | 3.60 | 0.54 |

⃰Data are given as mean values and standard deviations, *n* = 130, 71 boys and 59 girls

**OSM Table 2.** Characteristics of the three included single nucleotide polymorphisms (SNPs) in the fatty acid desaturase gene cluster (*FADS*)⃰

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  |  |  | Genotype |  |  |
| SNP | Gene | Allelle M/m | M/M (*n*) | M/m (*n*) | m/m (*n*) | MAF (%) | *p* |
| rs1535† |  *FADS2* | A/G | 58 | 46 | 11 | 29.6 | 0.671 |
| rs174575‡ |  *FADS2* | C/G | 72 | 35 | 5 | 20.1 | 0.778 |
| rs174448† |  Intergenic | A/G | 60 | 42 | 13 | 29.6 | 0.187 |

⃰Data are given as number of participants (*n*) and minor allele frequency (MAF) in percentages with *p*-values for Hardy-Weinberg equilibrium derived from Pearson’s chi-squared test.

† Based on directly imputed genotypes in *n* = 115, distributed as indicated on major allele homozygotes (MM), heterozygotes (Mm) and minor allele homozygotes (mm).

‡ Based on imputed dosage information in *n*=112 individuals.

**OSM Table 3.** Pairwise correlations between the three included single nucleotide polymorphisms (SNPs) in the fatty acid desaturase gene cluster (*FADS)* among the study infants⃰

|  |  |  |
| --- | --- | --- |
|  | rs1535 | rs174575 |
| rs1535 |  |  |
| rs174575 | 0.73 |  |
| rs174448 | 0.69 | 0.51 |

⃰Correlations were determined by Kendall’s tau with SNP in two levels (MM and Mm + mm).

**OSM Table 4.** Multiple linear regression analysis of potential determinants of erythrocyte

docosahexaenoic acid at 9 months

|  |  |  |  |
| --- | --- | --- | --- |
|  | *β* | 95% CI | *p* |
| Birth weight (kg) | -0.14 | -0.56, 0.27 | 0.488 |
| Infant still breastfed at 9 mo (yes) ⃰ | -0.16 | -0.87, 0.55 | 0.662 |
| Duration of breastfeeding (mo)† | -0.01 | -0.12, 0.10 | 0.927 |
| Age at introduction to fish | -0.03 | -0.09, 0.03 | 0.255 |
| rs1535 (M/m + m/m)‡ | -0.16 | -0.96, 0.64 | 0.696 |
| rs174448 (M/m + m/m)‡ | 0.40 | -0.25, 1.05 | 0.223 |
| rs174575 (M/m + m/m)‡ | -0.38 | -1.08, 0.32 | 0.282 |
| Sex (boy)§ | -0.45 | -0.92, 0.02 | 0.062 |
| Parity (multiparous)# | 0.04 | -0.36, 0.44 | 0.839 |

Data are given as regression coefficient of slope (*β*) and 95% confidence intervals (CI) from *n* = 86.

⃰ No breastfeeding at 9 months was set as the reference.

† Duration of any breastfeeding until the age of 9 months.

‡ Homozygotes for the major allele (M/M) were set as the reference.

§ Girls were set as the reference.

# Primiparous was set as the reference.

**OSM Table 5.** Association between scores in the Ages & Stages Questionnaire at 3 years of age and single nucleotide polymorphisms (SNPs) in the fatty acid desaturase (*FADS*) gene cluster (Table 3 including all ASQ sub-scores and sex stratified analysis) ⃰

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | rs1535 | rs174575 | rs174448 |  |
|  | *Difference* | SE | 95% CI | *P* | *Difference* | SE | 95% CI | *P* | *Difference* | SE | 95% CI | *P* | R2† |
| Gross motor |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  Main effect (n=66) | -2.50 | 1.69 | -5.89, 0.89 | 0.145 | 2.77 | 1.59 | -0.41; 5.95 | 0.087 | -0.29 | 1.26 | -2.82; 2.25 | 0.820 | -0.032 |
|  Interaction | 2.39 | 3.70 | -5.04; 9.82 | 0.521 | -1.57 | 3.54 | -8.67; 5.52 | 0.658 | -2.80 | 2.77 | -8.36; 2.77 | 0.318 | -0.064 |
|  Boys (n=41) | -2.37 | 2.49 | -7.44; 2.71 | 0.348 | 2.52 | 1.84 | -1.24; 6.27 | 0.181 | -1.24 | 1.71 | -4.74; 2.26 | 0.476 | 0.044 |
|  Girls (n=26) | -5.45 | 3.82 | -13.55; 2.65 | 0.173 | 5.82 | 4.20 | -3.09; 14.73 | 0.185 | 0.34 | 3.09 | -6.21; 6.88 | 0.915 | -0.151 |
| Communication |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  Main effect (n=66) | 2.63 | 3.67 | -4.72, 9.99 | 0.476 | -2.09 | 3.45 | -9.00, 4.82 | 0.547 | -1.75 | 2.75 | -7.26, 3.76 | 0.526 | -0.018 |
|  Interaction | 0.60 | 7.90 | -15.27, 16.46 | 0.940 | -11.85 | 7.55 | -27.00, 3.30 | 0.123 | 11.46 | 5.92 | -0.42, 23.34 | **0.058** | 0.034 |
|  Boys (n=40) | -1.15 | 7.21 | -15.88, 13.59 | 0.875 | -4.75 | 5.34 | -15.67, 6.17 | 0.381 | 3.70 | 4.98 | -6.49, 13.88 | 0.464 | -0.118 |
|  Girls (n=26) | 1.58 | 4.65 | -11.44, 8.28 | 0.739 | 6.64 | 5.11 | -4.20, 17.48 | 0.213 | -7.48 | 3.76 | -15.44, 0.48 | ***0.064*** | 0.019 |
| Problem solving |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  Main effect (n=66) | 4.84 | 4.37 | -3.92, 13.60 | 0.273 | -1.79 | 4.11 | -10.02, 6.45 | 0.666 | -2.62 | 3.27 | -9.19, 3.94 | 0.427 |  0.006 |
|  Sex-SNP interaction | 14.95 | 9.58 | -4.28, 34.18 | 0.125 | -10.82 | 9.15 | -29.19, 7.54 | 0.242 | -2.70 | 7.17 | -17.11, 11.70 | 0.708 | -0.003 |
|  Boys (n=40) | 10.03 | 9.32 | -9.04, 29.10 | 0.291 | -5.03 | 6.91 | -19.16, 9.10 | 0.473 | -5.10 | 6.44 | -18.28, 8.07 | 0.435 | -0.039 |
|  Girls (n=26) | -3.11 | 5.26 | -14.25, 8.04 | 0.563 | 5.65 | 5.78 | -6.60, 17.91 | 0.343 | -4.74 | 4.24 | -13.74, 4.26 | 0.280 |  0.190 |
| Fine motor |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  Main effect | 1.42 | 6.28 | -11.17, 14.01 | 0.822 | 2.93 | 5.90 | -8.90, 14.75 | 0.622 | -2.38 | 4.70 | -11.80, 7.04 | 0.614 |  0.050 |
|  Sex-SNP interaction | 15.79 | 13.26 | -10.81, 42.39 | 0.239 | -31.56 | 12.67 | -56.98, 6.14 | **0.016** | 2.36 | 9.93 | -17.56, 22.28 | 0.813 |  0.114 |
|  Boys (n=41) | 7.56 | 11.61 | -16.16, 31.28 | 0.520 | -5.12 | 8.59 | -22.66, 12.42 | 0.556 | -4.40 | 8.01 | -20.76, 11.96 | 0.587 |  0.052 |
|  Girls (n=26) | -4.96 | 6.96 | -19.72, 9.80 | 0.487 | 16.88 | 7.66 | 0.64, 33.11 | **0.043** | -6.68 | 5.62 | -18.60, 5.24 | 0.252 |  0.126 |
| Personal-social skills |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  Main effect  | 5.35 | 2.81 | -0.27, 10.97 | ***0.062*** | -4.90 | 2.64 | -10.18, 0.38 | ***0.068*** | -3.05 | 2.10 | -7.25, 1.16 | 0.153 |  0.251 |
|  Sex-SNP interaction | 7.28 | 6.09 | -4.94, 19.50 | 0.238 | -3.92 | 5.82 | -15.59, 7.76 | 0.504 | -2.38 | 4.56 | -11.53, 6.77 | 0.604 |  0.229 |
|  Boys (n=41) | 7.19 | 5.65 | -4.35, 18.72 | 0.213 | -7.08 | 4.18 | -15.62, 1.45 | 0.100 | -4.36 | 3.90 | -12.32, 3.59 | 0.272 |  0.211 |
|  Girls (n=26) | -0.24 | 2.77 | -6.11, 5.63 | 0.932 | -0.36 | 3.04 | -6.81, 6.09 | 0.908 | -2.90 | 2.24 | -7.64, 1.84 | 0.213 |  0.175 |

 ⃰The associations were examined by multiple linear regression analyses with inclusion of all three *FADS* SNPs and adjusted for sex, duration of exclusive breastfeeding, number of older siblings, highest household education and birthweight. Data are given as back-transformed difference for minor allele carriers *versus* major allele carriers (reference)*,* standard errors (SE), 95% confidence intervals (CI); and adjusted R-squared (R2) (n=67 unless otherwise indicated). Results for main effects, sex × SNP-interactions and for boys and girls are all from separate analysis.

**OSM Table 5a.** Crude analyses only adjusted for sex, education and siblings (not potential mediators – e.g. birth weight and breastfeeding) (n=???).

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | rs1535 | rs174575 | rs174448 |  |
|  | *β* | SE | 95% CI | *P* | *β* | SE | 95% CI | *P* | *β* | SE | 95% CI | *P* | R2† |
| Fine motor |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  Main effect | 4.097 | 5.608 | -7.103, 15.298 | 0.468 | 1.013 | 5.134 | -9.241, 11.267 | 0.844 | -2.103 | 4.354 | -10.799, 6.593 | 0.631 | 0.101 |
|  Interaction | 15.706 | 11.885 | -8.052, 39.463 | 0.191 | -29.428 | 11.106 | -51.628, 7.227 | **0.010** | 2.027 | 9.158 | -16.280, 20.334 | 0.826 | 0.162 |
| Problem solving |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  Main effect | 5.515 | 4.321 | -3.120, 14.150 | 0.207 | -2.819 | 3.949 | -10.711, 5.072 | 0.478 | -3.060 | 3.351 | -9.756, 3.637 | 0.365 | 0.059 |
|  Interaction | 13.824 | 9.465 | -5.109, 32.756 | 0.149 | -9.010 | 8.823 | -26.657, 8.638 | 0.311 | -3.428 | 7.295 | -18.021, 11.164 | 0.640 | 0.046 |
| Personal-social skills |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  Main effect | 3.895 | 2.717 | -1.532, 9.321 | 0.157 | -4.399 | 2.488 | -9.367, 0.569 | ***0.082*** | -2.738 | 2.110 | -6.951, 1.475 | 0.199 | 0.218 |
|  Interaction | 5.710 | 5.926 | -6.136, 17.556 | 0.339 | -2.088 | 5.538 | -13.157, 8.982 | 0.708 | -3.242 | 4.567 | -12.370, 5.887 | 0.480 | 0.194 |