

Table S1 Fatty acids composition of mouse fodders fortified by different oils (% , w/w)

Fatty acids	Olive oil fortified feeds	Flaxseed oil fortified feeds	Fish oil fortified feeds	Corn oil fortified feeds
C14:0	0.46361	0.43433	0.67803	0.35328
C14:1	0.02137	0.02067	0.02399	0.01719
C15:0	0.07426	0.07131	0.09739	0.05847
C16:0	12.25462	9.05732	7.94123	13.54229
C16:1	0.63377	0.31176	0.66373	0.28579
C18:0	3.78627	4.18014	3.62712	3.10487
C18:1	74.34919	36.08659	31.31998	44.89419
C18:2n6	7.0703	12.95275	4.36428	36.1489
C18:3n6	ND	ND	0.02915	ND
C18:3n3	0.62836	36.36632	0.48704	0.69361
C20:0	0.33972	0.18824	0.58572	0.37507
C20:1	0.1821	0.12288	1.25049	0.22816
C20:3n6	ND	ND	0.07839	ND
C20:4n6	ND	ND	0.6911	ND
C20:3n3	ND	ND	0.09646	ND
C20:5n3	ND	ND	7.98296	ND
C22:0	0.12864	0.12325	0.15372	0.13561
C22:2n6	ND	ND	0.03631	ND
C22:4n6	ND	ND	0.23974	ND
C24:0	0.06778	0.08443	0.11083	0.16259
C22:5n3	ND	ND	3.48976	ND
C22:6n3	ND	ND	36.05258	ND

ND, not detected.

Table S2 Primer sequences of target genes for PCR analysis

Genes	Forward	Reverse
MTHFR	CATCAACTCTCAGCCCAACA	GTTTCACGGGAGGTGAAGAA
SAHH	TGAGCAGATGAAGGATGACG	CTTTAGCCAGTAGCGGTCCA
GAMT	ATGTTTGAGGAGACGCAGGT	GAAGGCATAGTAGCGGCAGT
GNMT	AGTCAACAACAAAGCCCACA	GCACCAACTCCGTGAAAGA
MAT1 α	GCTTGTTTCAGGTGTCCTATGC	GCTCCCGCTCAGTCTTATTG
CSE	GGTGGCATCTGAATTTGGAC	GTTGGGTTTGTGGGTGTTTC
CBS	CGCACAGGAAGGACTGCTAT	CACAGAGTCAGGCAGGATGA
BHMT	AAGCATCTGGTAAGCCCGTA	AGTTCACGCCGACAATGG
MTR	GGAATACTTGCTGGCTGGAG	TGCAGAGCACTTGTTTCATCC
MTRR	AGTAAACAAGGAGCCGCTGA	GAAGGTGCTCCAGCAGTAGG
SHMT1	GTGGAAGGGCTGAGAAGGTA	GGGATGTCAATGCTGGAGT
DHFR	GAACTCAAAGAACCACCACGA	CTGCCTCCGACTATCCAAAC
TS	CTCTGCTCACAACCAAACGA	GCATCCCAGATTCTCACTCC
β -actin	GTGCTATGTTGCTCTAGACTTCG	ATGCCACAGGATTCCATACC

Table S3 Fatty acids composition (% w/w) in the liver of pregnant mouse on E8.5d (6h after VPA injection)

Fatty acids	Olive oil	Olive oil+VPA	Flaxseed oil+VPA	Fish oil+VPA	Corn oil+VPA
C14:0	0.252 ± 0.061 ^a	0.367 ± 0.017 ^{ab}	0.359 ± 0.092 ^{ab}	0.308 ± 0.093 ^a	0.439 ± 0.025 ^b
C14:1	0.006 ± 0.002 ^{ab}	0.013 ± 0.002 ^c	0.011 ± 0.007 ^{ac}	0.004 ± 0.001 ^b	0.012 ± 0.002 ^{ac}
C15:0	0.038 ± 0.007 ^a	0.042 ± 0.007 ^a	0.060 ± 0.007 ^b	0.068 ± 0.010 ^b	0.064 ± 0.014 ^b
C16:0	19.505 ± 2.330 ^a	19.465 ± 1.715 ^a	20.916 ± 1.648 ^a	25.299 ± 0.660 ^b	21.669 ± 1.800 ^a
C16:1	1.100 ± 0.079 ^{ac}	3.059 ± 0.052 ^b	2.354 ± 0.839 ^{bc}	0.918 ± 0.227 ^a	1.962 ± 0.606 ^c
C18:0	12.600 ± 0.952 ^{ab}	9.779 ± 0.304 ^a	10.697 ± 2.327 ^a	14.327 ± 2.278 ^b	9.729 ± 1.198 ^a
C18:1	41.090 ± 3.704 ^a	55.197 ± 3.314 ^b	34.072 ± 1.934 ^a	18.710 ± 6.554 ^c	36.680 ± 6.285 ^a
C18:2n6	8.727 ± 0.843 ^{ac}	4.201 ± 0.491 ^b	11.180 ± 1.964 ^{ad}	7.085 ± 2.150 ^c	13.416 ± 0.202 ^d
C18:3n6	0.080 ± 0.026 ^{ab}	0.120 ± 0.080 ^{ab}	0.128 ± 0.040 ^a	0.040 ± 0.005 ^b	0.329 ± 0.046 ^c
C18:3n3	0.081 ± 0.006 ^a	0.045 ± 0.007 ^a	3.663 ± 0.388 ^b	0.167 ± 0.027 ^a	0.139 ± 0.048 ^a
C20:0	0.043 ± 0.009 ^{ab}	0.029 ± 0.017 ^a	0.048 ± 0.009 ^{ab}	0.053 ± 0.013 ^b	0.050 ± 0.008 ^{ab}
C20:1	0.278 ± 0.130 ^{ab}	0.365 ± 0.240 ^a	0.185 ± 0.022 ^{ab}	0.128 ± 0.023 ^b	0.224 ± 0.015 ^{ab}
C20:3n6	0.567 ± 0.127 ^a	0.356 ± 0.149 ^{bc}	0.519 ± 0.041 ^{ab}	0.301 ± 0.052 ^c	0.293 ± 0.041 ^c
C20:4n6	9.196 ± 0.897 ^a	4.348 ± 0.445 ^b	4.211 ± 0.528 ^b	4.888 ± 0.583 ^b	10.100 ± 2.481 ^a
C20:3n3	0.038 ± 0.003 ^a	0.021 ± 0.009 ^a	0.114 ± 0.020 ^b	0.063 ± 0.007 ^c	0.031 ± 0.008 ^a
C20:5n3	0.102 ± 0.026 ^a	0.043 ± 0.017 ^a	3.218 ± 0.483 ^b	4.777 ± 0.883 ^c	0.036 ± 0.012 ^a
C22:0	0.099 ± 0.013 ^{ab}	0.059 ± 0.022 ^a	0.114 ± 0.025 ^b	0.143 ± 0.032 ^b	0.104 ± 0.026 ^{ab}
C22:2n6	0.020 ± 0.001	0.015 ± 0.012	0.007 ± 0.006	0.007 ± 0.003	0.016 ± 0.011
C22:4n6	0.095 ± 0.020 ^a	0.049 ± 0.016 ^b	0.035 ± 0.001 ^b	0.056 ± 0.014 ^b	0.154 ± 0.015 ^c
C24:0	0.089 ± 0.017 ^a	0.058 ± 0.025 ^a	0.138 ± 0.073 ^a	0.268 ± 0.074 ^b	0.097 ± 0.018 ^a
C22:5n3	0.075 ± 0.019 ^a	0.024 ± 0.004 ^a	0.450 ± 0.051 ^b	0.678 ± 0.191 ^c	0.057 ± 0.009 ^a
C22:6n3	5.918 ± 0.749 ^{ad}	2.343 ± 0.675 ^b	7.521 ± 0.141 ^a	21.713 ± 2.635 ^c	4.400 ± 1.183 ^{bd}

Values marked with different letter in each group differed significantly.

Table S4 Fatty acids composition (% w/w) in the liver of pregnant mouse on E9.5d (24h after VPA injection)

Fatty acids	Olive oil	Olive oil+VPA	Flaxseed oil+VPA	Fish oil+VPA	Corn oil+VPA
C14:0	0.262 ± 0.058 ^{ab}	0.320 ± 0.031 ^a	0.192 ± 0.072 ^b	0.174 ± 0.019 ^b	0.318 ± 0.087 ^a
C14:1	0.006 ± 0.001	0.007 ± 0.001	0.005 ± 0.002	0.004 ± 0.002	0.008 ± 0.007
C15:0	0.042 ± 0.008 ^a	0.044 ± 0.005 ^a	0.069 ± 0.004 ^b	0.049 ± 0.007 ^a	0.047 ± 0.014 ^a
C16:0	19.424 ± 2.208 ^a	18.739 ± 0.724 ^a	22.386 ± 0.769 ^b	23.313 ± 1.511 ^b	19.698 ± 1.422 ^a
C16:1	1.115 ± 0.057 ^{ab}	1.679 ± 0.065 ^a	1.162 ± 0.522 ^{ab}	0.545 ± 0.027 ^b	1.310 ± 1.011 ^{ab}
C18:0	12.641 ± 1.696	13.203 ± 3.267	13.916 ± 1.252	17.377 ± 0.589	13.648 ± 5.570
C18:1	40.433 ± 5.030 ^a	48.789 ± 2.751 ^b	19.903 ± 1.983 ^c	15.132 ± 0.887 ^c	32.513 ± 6.630 ^d
C18:2n6	9.008 ± 0.955 ^{ac}	5.746 ± 0.856 ^a	15.369 ± 0.672 ^b	9.547 ± 1.160 ^c	15.508 ± 3.693 ^b
C18:3n6	0.087 ± 0.025 ^a	0.059 ± 0.006 ^a	0.048 ± 0.001 ^a	0.038 ± 0.009 ^a	0.206 ± 0.094 ^b
C18:3n3	0.089 ± 0.008 ^a	0.043 ± 0.011 ^a	5.323 ± 1.077 ^b	0.155 ± 0.063 ^a	0.104 ± 0.041 ^a
C20:0	0.049 ± 0.012 ^a	0.035 ± 0.002 ^b	0.079 ± 0.009 ^c	0.056 ± 0.003 ^a	0.049 ± 0.006 ^{ab}
C20:1	0.280 ± 0.138 ^a	0.343 ± 0.085 ^a	0.234 ± 0.027 ^{ab}	0.079 ± 0.004 ^b	0.244 ± 0.125 ^{ab}
C20:3n6	0.597 ± 0.208 ^a	0.641 ± 0.027 ^a	0.634 ± 0.030 ^a	0.341 ± 0.029 ^b	0.403 ± 0.074 ^b
C20:4n6	9.463 ± 1.098 ^{ac}	6.454 ± 0.491 ^{ab}	4.464 ± 0.582 ^b	6.058 ± 0.325 ^b	10.733 ± 3.553 ^c
C20:3n3	0.041 ± 0.006 ^a	0.033 ± 0.004 ^a	0.333 ± 0.075 ^b	0.054 ± 0.012 ^a	0.043 ± 0.016 ^a
C20:5n3	0.112 ± 0.034 ^a	0.083 ± 0.013 ^a	4.934 ± 1.330 ^b	4.602 ± 1.461 ^b	0.044 ± 0.015 ^a
C22:0	0.113 ± 0.022 ^{ac}	0.077 ± 0.005 ^a	0.169 ± 0.017 ^b	0.112 ± 0.015 ^{ac}	0.120 ± 0.035 ^c
C22:2n6	0.020 ± 0.009 ^a	0.018 ± 0.005 ^a	0.016 ± 0.005 ^{ab}	0.007 ± 0.005 ^{bc}	0.006 ± 0.001 ^c
C22:4n6	0.105 ± 0.013 ^a	0.068 ± 0.007 ^{ab}	0.043 ± 0.003 ^b	0.071 ± 0.023 ^{ab}	0.147 ± 0.042 ^c
C24:0	0.097 ± 0.022 ^a	0.074 ± 0.009 ^a	0.167 ± 0.043 ^b	0.152 ± 0.016 ^b	0.110 ± 0.028 ^a
C22:5n3	0.082 ± 0.024 ^a	0.038 ± 0.004 ^a	0.824 ± 0.141 ^b	0.864 ± 0.060 ^b	0.066 ± 0.039 ^a
C22:6n3	5.931 ± 0.680 ^a	3.506 ± 0.162 ^b	9.730 ± 1.350 ^c	21.268 ± 0.464 ^d	4.676 ± 1.420 ^{ab}

Values marked with different letter in each group differed significantly.

Table S5 Fatty acids composition (% w/w) in embryo on E8.5d (6h after VPA injection)

Fatty acids	Olive oil	Olive oil+VPA	Flaxseed oil+VPA	Fish oil+VPA	Corn oil+VPA
C14:0	0.539 ± 0.008 ^{ab}	0.546 ± 0.069 ^{ab}	0.458 ± 0.077 ^a	0.571 ± 0.084 ^b	0.522 ± 0.021 ^{ab}
C14:1	0.067 ± 0.012 ^a	0.149 ± 0.040 ^b	0.108 ± 0.029 ^{ab}	0.109 ± 0.045 ^{ab}	0.064 ± 0.002 ^a
C15:0	0.281 ± 0.096 ^{ab}	0.185 ± 0.020 ^a	0.159 ± 0.138 ^a	0.466 ± 0.206 ^b	0.221 ± 0.032 ^a
C16:0	17.663 ± 1.208 ^{ab}	17.556 ± 1.964 ^{ab}	17.886 ± 0.895 ^{ab}	19.740 ± 2.032 ^a	17.165 ± 0.490 ^b
C16:1	1.379 ± 0.522	1.522 ± 0.195	1.267 ± 0.146	1.446 ± 0.318	1.787 ± 0.071
C18:0	20.574 ± 0.471 ^a	19.275 ± 2.984 ^a	21.320 ± 1.688 ^{ab}	20.632 ± 0.195 ^a	23.309 ± 0.458 ^b
C18:1	19.283 ± 1.128 ^a	23.533 ± 3.683 ^b	16.342 ± 1.048 ^{ac}	15.919 ± 0.391 ^c	15.275 ± 0.468 ^c
C18:2n6	7.394 ± 0.332 ^a	7.496 ± 1.669 ^a	10.783 ± 1.014 ^b	4.391 ± 0.720 ^c	11.063 ± 0.796 ^b
C18:3n6	0.106 ± 0.039 ^{ab}	0.068 ± 0.005 ^{ac}	0.059 ± 0.010 ^c	0.065 ± 0.029 ^c	0.137 ± 0.010 ^b
C18:3n3	0.069 ± 0.008 ^a	0.066 ± 0.001 ^a	0.872 ± 0.050 ^b	0.054 ± 0.009 ^a	0.040 ± 0.014 ^a
C20:0	0.161 ± 0.052 ^a	0.138 ± 0.019 ^a	0.069 ± 0.026 ^b	0.133 ± 0.022 ^a	0.100 ± 0.056 ^{ab}
C20:1	0.154 ± 0.082 ^a	0.106 ± 0.022 ^{ab}	0.052 ± 0.034 ^b	0.116 ± 0.025 ^{ab}	0.086 ± 0.044 ^{ab}
C20:3n6	2.268 ± 1.454 ^a	1.548 ± 0.221 ^{ab}	1.437 ± 0.401 ^{ab}	0.871 ± 0.451 ^b	1.040 ± 0.073 ^{ab}
C20:4n6	19.590 ± 2.380 ^a	18.079 ± 2.308 ^a	9.014 ± 0.631 ^b	6.537 ± 0.686 ^b	20.209 ± 0.817 ^a
C20:3n3	0.144 ± 0.042 ^a	0.096 ± 0.005 ^a	0.337 ± 0.107 ^b	0.315 ± 0.061 ^b	0.124 ± 0.027 ^a
C20:5n3	0.521 ± 0.087 ^a	0.518 ± 0.068 ^a	5.443 ± 1.087 ^b	6.006 ± 0.336 ^b	0.508 ± 0.137 ^a
C22:0	0.397 ± 0.229	0.116 ± 0.054	0.375 ± 0.370	0.278 ± 0.055	0.280 ± 0.152
C22:2n6	0.193 ± 0.047 ^a	0.138 ± 0.022 ^a	0.022 ± 0.004 ^b	0.072 ± 0.039 ^b	0.045 ± 0.028 ^b
C22:4n6	1.277 ± 0.373 ^a	1.245 ± 0.263 ^a	0.291 ± 0.011 ^b	0.277 ± 0.161 ^b	1.520 ± 0.122 ^a
C24:0	0.138 ± 0.059 ^a	0.096 ± 0.021 ^a	1.971 ± 0.479 ^b	0.673 ± 0.114 ^c	0.096 ± 0.035 ^a
C22:5n3	0.064 ± 0.022 ^a	0.066 ± 0.017 ^a	0.335 ± 0.028 ^b	0.344 ± 0.028 ^b	0.058 ± 0.012 ^a
C22:6n3	7.736 ± 0.625 ^a	7.456 ± 0.865 ^a	11.400 ± 1.347 ^b	20.987 ± 0.961 ^c	6.350 ± 0.267 ^a

Values marked with different letter in each group differed significantly.

Table S6 Fatty acids composition (% w/w) in embryo on E9.5d (24h after VPA injection)

Fatty acids	Olive oil	Olive oil+VPA	Flaxseed oil+VPA	Fish oil+VPA	Corn oil+VPA
C14:0	0.502 ± 0.151	0.562 ± 0.042	0.529 ± 0.144	0.672 ± 0.174	0.497 ± 0.039
C14:1	0.064 ± 0.009 ^a	0.132 ± 0.049 ^b	0.114 ± 0.019 ^{ab}	0.114 ± 0.041 ^{ab}	0.088 ± 0.041 ^{ab}
C15:0	0.230 ± 0.143 ^{ab}	0.177 ± 0.031 ^{ab}	0.185 ± 0.050 ^{ab}	0.276 ± 0.040 ^a	0.157 ± 0.019 ^b
C16:0	17.833 ± 0.803 ^{ab}	16.464 ± 0.379 ^{ac}	18.023 ± 0.721 ^{ab}	18.583 ± 1.314 ^b	15.093 ± 1.336 ^c
C16:1	1.582 ± 0.278 ^a	1.484 ± 0.165 ^a	1.301 ± 0.179 ^a	1.515 ± 0.037 ^a	0.889 ± 0.117 ^b
C18:0	21.108 ± 1.007	20.917 ± 1.593	22.325 ± 1.390	20.332 ± 2.257	22.750 ± 3.403
C18:1	19.830 ± 1.048 ^a	20.532 ± 0.504 ^a	15.664 ± 1.277 ^b	14.508 ± 1.404 ^b	14.034 ± 0.582 ^b
C18:2n6	8.318 ± 0.181 ^a	7.777 ± 0.101 ^a	11.224 ± 1.063 ^b	5.596 ± 0.502 ^c	11.382 ± 0.456 ^b
C18:3n6	0.190 ± 0.158 ^a	0.051 ± 0.004 ^b	0.068 ± 0.006 ^{ab}	0.046 ± 0.029 ^b	0.106 ± 0.017 ^{ab}
C18:3n3	0.075 ± 0.026 ^a	0.061 ± 0.012 ^a	0.888 ± 0.055 ^b	0.060 ± 0.006 ^a	0.039 ± 0.005 ^a
C20:0	0.149 ± 0.034 ^a	0.188 ± 0.053 ^a	0.080 ± 0.014 ^{bc}	0.037 ± 0.009 ^b	0.096 ± 0.018 ^c
C20:1	0.130 ± 0.044 ^a	0.150 ± 0.033 ^a	0.056 ± 0.024 ^{bc}	0.022 ± 0.007 ^b	0.080 ± 0.023 ^c
C20:3n6	1.587 ± 0.085 ^a	1.691 ± 0.240 ^a	1.157 ± 0.216 ^b	0.875 ± 0.073 ^b	1.109 ± 0.278 ^b
C20:4n6	17.900 ± 1.450 ^a	19.347 ± 0.541 ^a	9.230 ± 0.774 ^b	7.111 ± 0.615 ^b	23.126 ± 2.348 ^c
C20:3n3	0.193 ± 0.079 ^{ab}	0.115 ± 0.044 ^{ac}	0.262 ± 0.067 ^{bd}	0.309 ± 0.033 ^d	0.085 ± 0.027 ^c
C20:5n3	0.431 ± 0.087 ^a	0.428 ± 0.064 ^a	4.556 ± 0.839 ^b	7.177 ± 0.663 ^c	0.490 ± 0.106 ^a
C22:0	0.305 ± 0.226	0.240 ± 0.146	0.242 ± 0.087	0.225 ± 0.097	0.343 ± 0.131
C22:2n6	0.187 ± 0.041 ^a	0.134 ± 0.008 ^b	0.020 ± 0.001 ^c	0.040 ± 0.023 ^c	0.055 ± 0.013 ^c
C22:4n6	1.234 ± 0.305 ^a	1.357 ± 0.035 ^a	0.310 ± 0.033 ^b	0.297 ± 0.256 ^b	2.042 ± 0.357 ^c
C24:0	0.136 ± 0.061 ^a	0.114 ± 0.025 ^a	2.170 ± 0.309 ^b	0.711 ± 0.204 ^c	0.109 ± 0.015 ^a
C22:5n3	0.062 ± 0.022 ^a	0.089 ± 0.017 ^a	0.375 ± 0.038 ^b	0.525 ± 0.114 ^c	0.058 ± 0.027 ^a
C22:6n3	7.953 ± 0.217 ^a	7.991 ± 0.664 ^a	11.220 ± 1.615 ^b	20.967 ± 1.025 ^c	7.370 ± 1.245 ^a

Values marked with different letter in each group differed significantly.