

Supplementary Tables

Supplementary Table 1 Search strategy.

Items	Description	Search terms (Add with AND)
Population	Human	
Exposure	The minor allele (TC+CC) carriers of the rs174547 SNP in <i>FADS1</i> gene	All Fields: ('rs174547' OR ' <i>FADS1</i> SNP' OR ' <i>FADS1</i> and SNP' OR ' <i>FADS</i> ')
Comparison	Major allele homozygote (TT) carriers of the rs174547 SNP in <i>FADS1</i> gene	
Outcomes	Long-chain polyunsaturated fatty acids: LA, GLA, DGLA, AA, ALA, EPA, DHA; D5D activity, D6D activity	All Fields: ('fatty acid' OR 'alpha linolenic acid' OR 'ala' OR 'linolenic acid' OR 'la' OR 'eicosapentaenoic acid' OR 'epa' OR 'docosahexaenoic acid' OR 'dha' OR 'gamma linolenic acid' OR 'gla' OR 'dihomo- γ -linolenic acid' OR 'dgl' OR 'long chain fatty acid' OR 'long-chain polyunsaturated fatty acids' OR 'delta-5 fatty acid desaturase activity' OR 'delta-6 fatty acid desaturase activity')

Abbreviation: LA, linoleic acid; GLA, γ -linolenic acid; DGLA, dihomomath- γ -linolenic acid; AA, arachidonic acid; ALA, alpha-linolenic acid; EPA, eicosapentaenoic acid; DHA, docosahexaenoic acid; D5D, delta-5 desaturase; D6D, delta-6 desaturase.

Supplementary Table 2 Methodological quality assessment according to the Newcastle-Ottawa Scale (NOS).

Study	Selection				Comparability		Outcome		Total score
	Representativeness of the cohort	Intervention or not	Selection of the non-exposed cohort	Whether the study time is clear	Comparability of cohorts on the basis of the design or analysis	Assessment of outcome	Adequacy of follow-up of cohorts	Results of the analysis is comprehensive or not	
Merino DM et al. ⁽¹⁸⁾	1	--	1	1	1	1	1	1	6
Lu Y et al. ⁽¹⁹⁾	1	--	1	1	1	1	1	1	7
Horiguchi S et al. ⁽²⁰⁾	1	--	--	1	1	1	1	1	6
Ding Z et al. ⁽¹⁶⁾	1	--	--	1	1	1	1	1	6
Cribb L et al. ⁽²¹⁾	1	--	--	1	1	1	1	1	6
de la Garza Puentes A et al. ⁽²²⁾	1	--	1	1	1	1	1	1	7
Huang MC et al. ⁽²³⁾	1	--	1	1	1	1	1	1	7
Kim M et al. ⁽¹²⁾	1	--	1	1	1	1	1	1	7
Muzsik A et	1	--	--	1	1	1	1	1	6

al. ⁽²⁴⁾										
Sasaki H et al. ⁽²⁵⁾	1	1	--	1	1	1	1	1	1	7
Nita R et al. ⁽²⁶⁾	1	--	--	1	1	1	1	1	1	6

Supplementary Table 3 PECO table for included papers.

Studies	Population	Exposure (minor allele carriers)	Comparison (major allele homozygous)	Outcomes
Merino DM et al. ⁽¹⁸⁾	Caucasians aged 20-29 years	TC+CC	TT	D5D activity, D6D activity
Lu Y et al. ⁽¹⁹⁾	aged 20-59 years from Netherlands	TC+CC	TT	LA, GLA, DGLA, AA, ALA, EPA, DHA, D5D activity, D6D activity
Horiguchi S et al. a/b ⁽²⁰⁾	65 years of age or older from Japan	TC+CC	TT	LA, GLA, DGLA, AA, ALA, EPA, DHA, D5D activity
Ding Z et al. ⁽¹⁶⁾	healthy Chinese Han lactating mothers aged 22-39 years	TC+CC	TT	LA, GLA, DGLA, AA, ALA, EPA, DHA
Cribb L et al. ⁽²¹⁾	major depressive disorder and non- depressed participants aged 18-75 years from Australia	TC+CC	TT	LA, ALA, EPA
de la Garza Puentes A et al. a ⁽²²⁾	singleton pregnancy, normal weight pregnant women from Spain	TC+CC	TT	LA, DGLA, AA, ALA, EPA, D5D activity

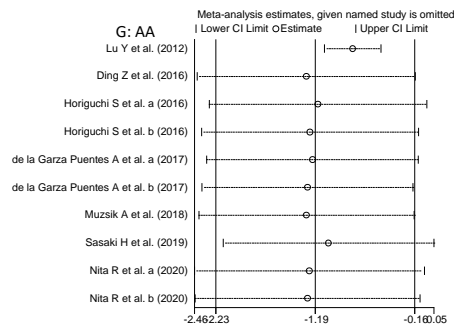
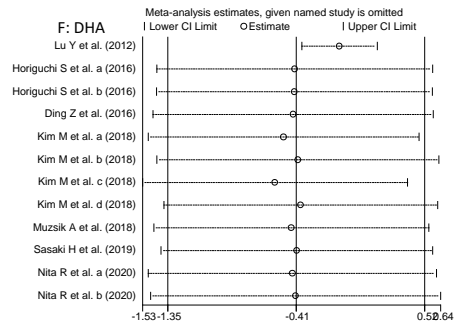
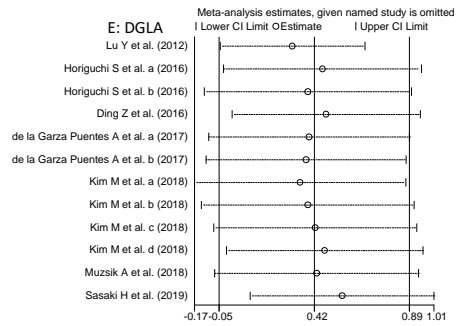
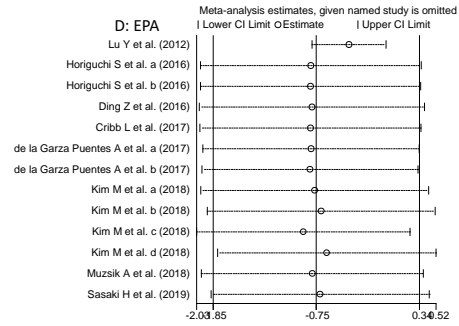
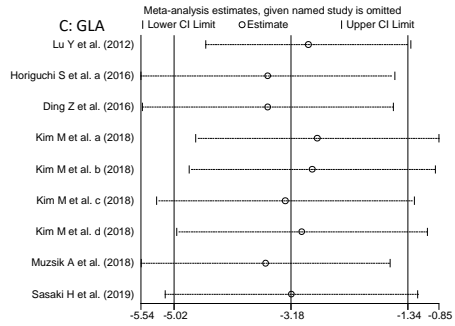
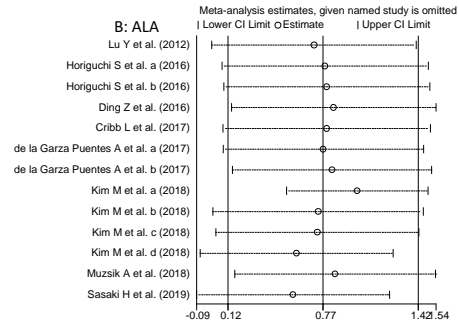
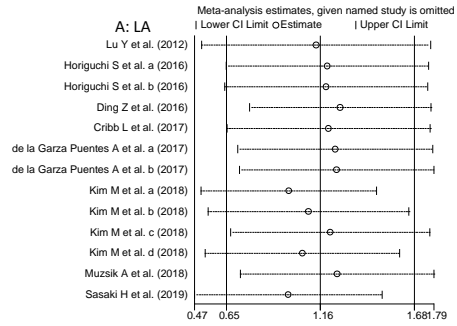
de la Garza Puentes A et al. b ⁽²²⁾	singleton pregnancy, overweight or obesity pregnant women from Spain	TC+CC	TT	LA, DGLA, AA, ALA, EPA, D5D activity
Huang MC et al. ⁽²³⁾	aged 30-70 years old with type 2 diabetes from Taiwan	TC+CC	TT	D5D activity, D6D activity
Kim M et al. a/b ⁽¹²⁾	normal weight participants from Korea	TC+CC	TT	LA, GLA, DGLA, AA, ALA, EPA, DHA, D6D activity
Kim M et al. c/d ⁽¹²⁾	overweight participants from Korea	TC+CC	TT	LA, GLA, DGLA, AA, ALA, EPA, DHA, D6D activity
Muzsik A et al. ⁽²⁴⁾	postmenopausal women with central obesity and under 70 years of age from Poland	TC+CC	TT	LA, GLA, DGLA, AA, ALA, EPA, DHA, D5D activity, D6D activity
Sasaki H et al. ⁽²⁵⁾	healthy young (25-34 years) and elderly (65-74 years) participants from Japan	TC+CC	TT	LA, GLA, DGLA, AA, ALA, EPA, DHA, D5D activity, D6D activity
Nita R et al. a/b ⁽²⁶⁾	newborns and the pregnant women at the first trimester from Japan	TC+CC	TT	maternal blood: AA, DHA cord blood: AA, DHA, D5D activity

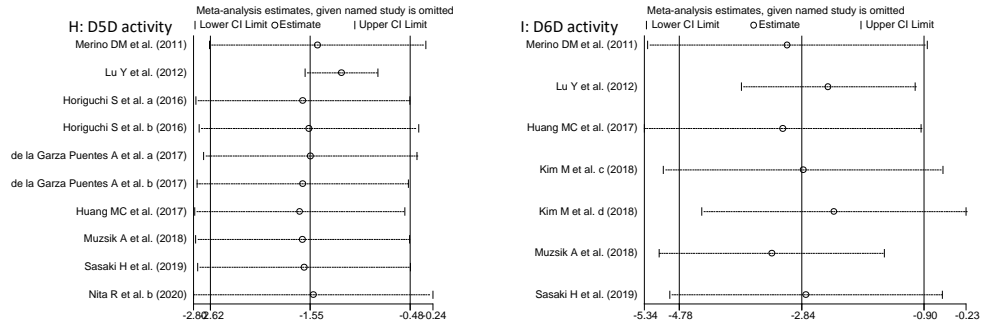
Abbreviation: LA, linoleic acid; GLA, γ -linolenic acid; DGLA, dihomogamma-linolenic acid; AA, arachidonic acid; ALA, alpha-linolenic acid; EPA, eicosapentaenoic acid; DHA, docosahexaenoic acid; D5D, delta-5 desaturase; D6D, delta-6 desaturase. D5D and D6D activities were assessed by the ratio of AA to DGLA and GLA to LA, respectively.

Supplementary Table 4 Publication bias of the SNP rs174547 in *FADS1* on the level of LC-PUFA (*P* value).

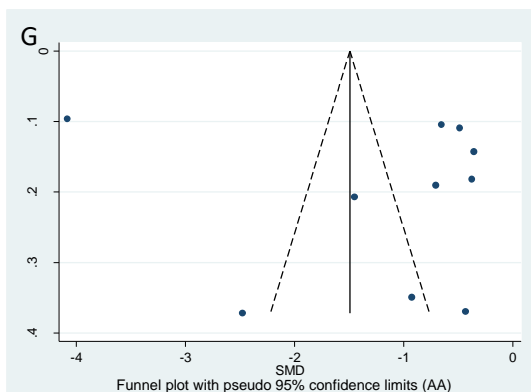
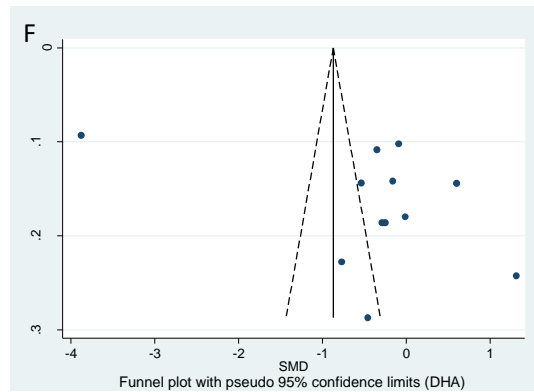
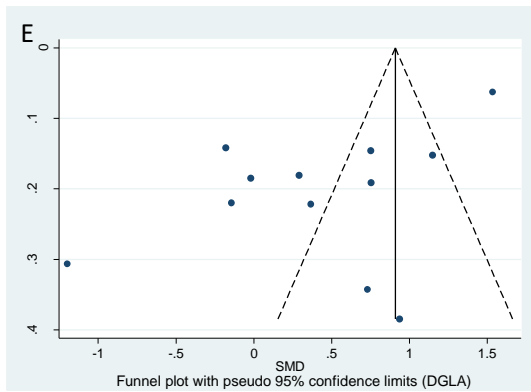
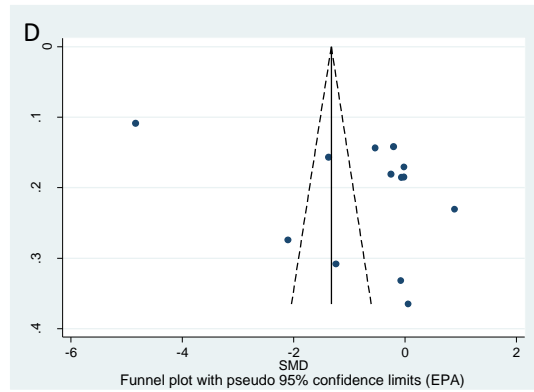
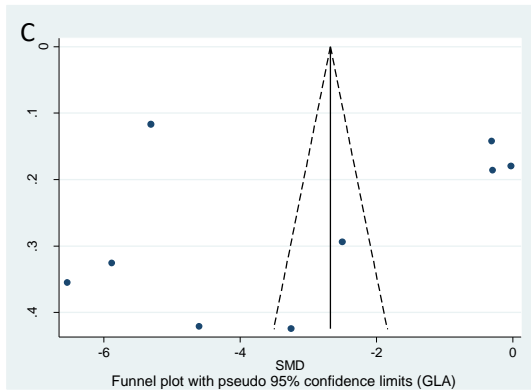
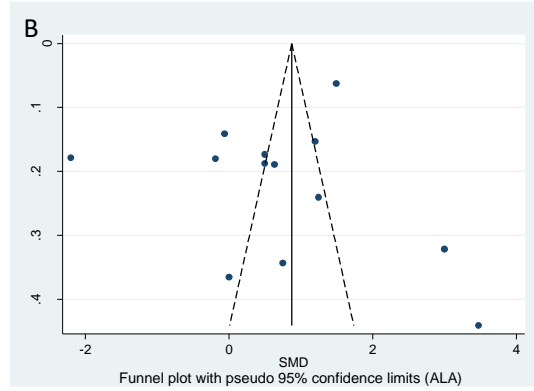
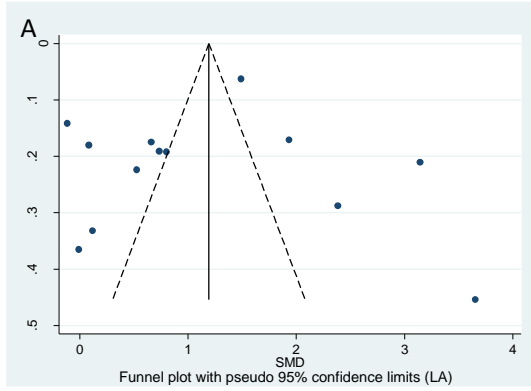
Fatty acid	Begg's test	Egger's test
LA	0.951	0.677
GLA	0.348	0.747
DGLA	1.000	0.006
AA	0.107	0.480
ALA	0.428	0.384
EPA	0.951	0.075
DHA	0.537	0.114
D5D activity	0.858	0.041
D6D activity	0.230	0.481

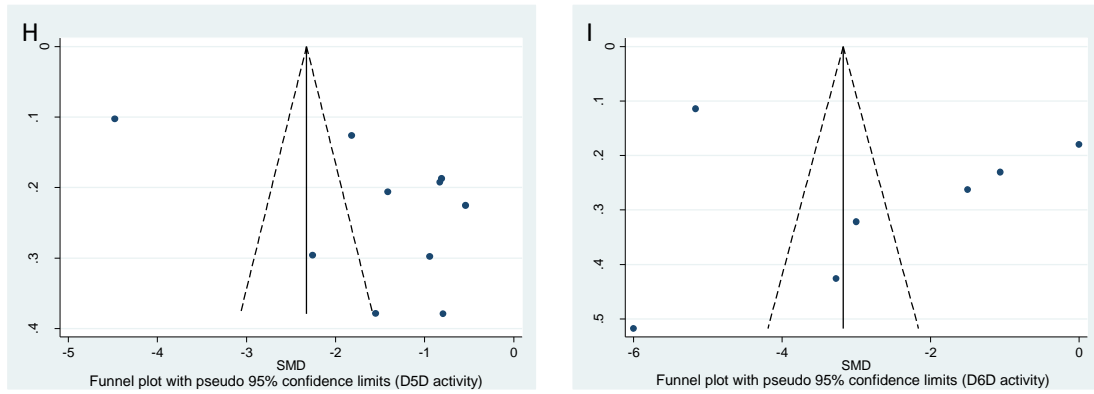
Abbreviation: LA, linoleic acid; GLA, γ -linolenic acid; DGLA, dihomo- γ -linolenic acid; AA, arachidonic acid; ALA, alpha-linolenic acid; EPA, eicosapentaenoic acid; DHA, docosahexaenoic acid; D5D, delta-5 desaturase; D6D, delta-6 desaturase. D5D and D6D activities were assessed by the ratio of AA to DGLA and GLA to LA, respectively.





Supplementary Figure 1 Sensitivity analysis of the SNP rs174547 in *FADS1* on the level of LC-PUFA. Abbreviation: LA, linoleic acid; ALA, alpha-linolenic acid; GLA, γ -linolenic acid; EPA, eicosapentaenoic acid; DGLA, dihomo- γ -linolenic acid; DHA, docosahexaenoic acid; AA, arachidonic acid; D5D, delta-5 desaturase; D6D, delta-6 desaturase. A: The sensitivity analysis of LA; B: The sensitivity analysis of ALA; C: The sensitivity analysis of GLA; D: The sensitivity analysis of EPA; E: The sensitivity analysis of DGLA; F: The sensitivity analysis of DHA; G: The sensitivity analysis of AA; H: The sensitivity analysis of D5D activity; I: The sensitivity analysis of D6D activity. D5D and D6D activities were assessed by the ratio of AA to DGLA and GLA to LA, respectively.





Supplementary Figure 2 Funnel plots of the SNP rs174547 in *FADS1* on the level of LC-PUFA. Abbreviation: LA, linoleic acid; ALA, alpha-linolenic acid; GLA, γ -linolenic acid; EPA, eicosapentaenoic acid; DGLA, dihomo- γ -linolenic acid; DHA, docosahexaenoic acid; AA, arachidonic acid; D5D, delta-5 desaturase; D6D, delta-6 desaturase. A: The funnel plot of LA; B: The funnel plot of ALA; C: The funnel plot of GLA; D: The funnel plot of EPA; E: The funnel plot of DGLA; F: The funnel plot of DHA; G: The funnel plot of AA; H: The funnel plot of D5D activity; I: The funnel plot of D6D activity. D5D and D6D activities were assessed by the ratio of AA to DGLA and GLA to LA, respectively.