Figure1. Mendelian randomization results of causal effects between food type and cortical regions

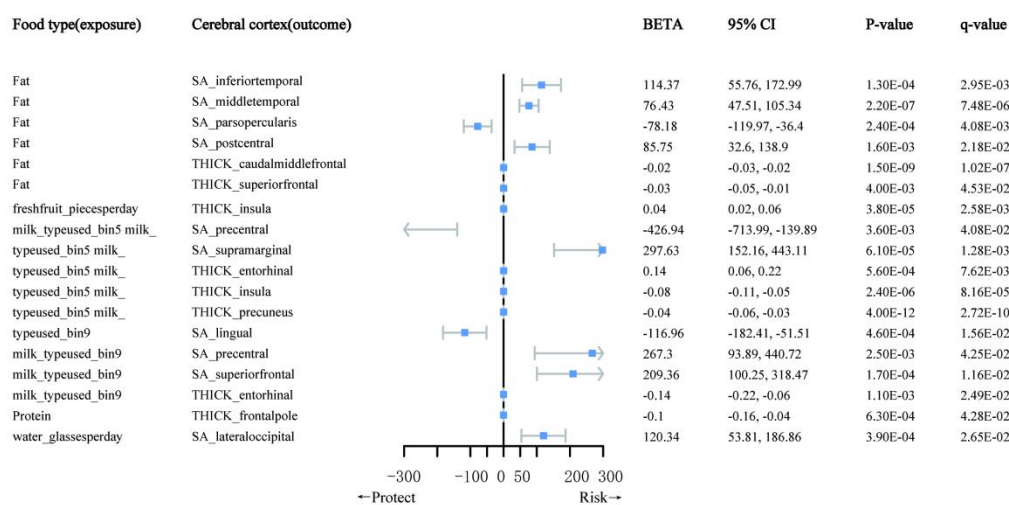| Food type(exposure)	Cerebral cortex(outcome)	BETA	95% CI	P-value	q-value
Fat	SA_inferiortemporal	114.37	55.76, 172.99	1.30E-04	2.95E-03
Fat	SA_middletemporal	76.43	47.51, 105.34	2.20E-07	7.48E-06
Fat	SA_parsopercularis	-78.18	-119.97, -36.4	2.40E-04	4.08E-03
Fat	SA_postcentral	85.75	32.6, 138.9	1.60E-03	2.18E-02
Fat	THICK_caudalmiddlefrontal	-0.02	-0.03, -0.02	1.50E-09	1.02E-07
Fat	THICK_superiorfrontal	-0.03	-0.05, -0.01	4.00E-03	4.53E-02
freshfruit_piecesperday	THICK_insula	0.04	0.02, 0.06	3.80E-05	2.58E-03
milk_typeused_bin5 milk_	SA_precentral	-426.94	-713.99, -139.89	3.60E-03	4.08E-02
typeused_bin5 milk_	SA_supramarginal	297.63	152.16, 443.11	6.10E-05	1.28E-03
typeused_bin5 milk_	THICK_entorhinal	0.14	0.06, 0.22	5.60E-04	7.62E-03
typeused_bin5 milk_	THICK_insula	-0.08	-0.11, -0.05	2.40E-06	8.16E-05
typeused_bin5 milk_	THICK_precuneus	-0.04	-0.06, -0.03	4.00E-12	2.72E-10
typeused_bin9	SA_lingual	-116.96	-182.41, -51.51	4.60E-04	1.56E-02
milk_typeused_bin9	SA_precentral	267.3	93.89, 440.72	2.50E-03	4.25E-02
milk_typeused_bin9	SA_superiorfrontal	209.36	100.25, 318.47	1.70E-04	1.16E-02
milk_typeused_bin9	THICK_entorhinal	-0.14	-0.22, -0.06	1.10E-03	2.49E-02
Protein	THICK_frontalpole	-0.1	-0.16, -0.04	6.30E-04	4.28E-02
water_glassesperday	SA_lateraloccipital	120.34	53.81, 186.86	3.90E-04	2.65E-02

Figure2. Mendelian randomization results of causal effects between cortical regions and food type

Cerebral cortex(exposure)	Food type(outcome)	BETA	95% CI	P-value	q-value
THICK_caudalanteriorcingulate	alcohol_overallfreq	-0.18	-0.28, -0.09	1.40E-04	9.52E-03
THICK_caudalanteriorcingulate	Carbohydrate	0.29	0.12, 0.45	6.30E-04	3.09E-02
THICK_lateraloccipital	coffee_cupsperday	-0.48	-0.71, -0.24	5.50E-05	3.74E-03
THICK_lateralorbitofrontal	coffee_cupsperday	-0.29	-0.45, -0.13	4.20E-04	1.43E-02
SA_medialorbitofrontal	nonoilyfish_overallfreq	-2.70E-04	0, 0	2.70E-07	1.84E-05
THICK_paracentral	oilyfish_overallfreq	-0.47	-0.72, -0.23	1.80E-04	1.22E-02

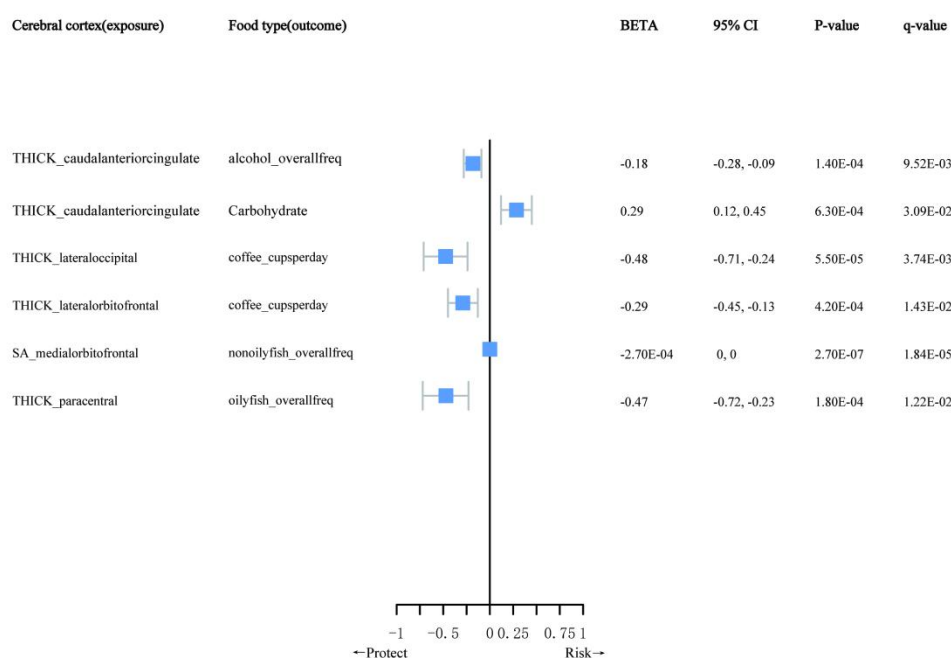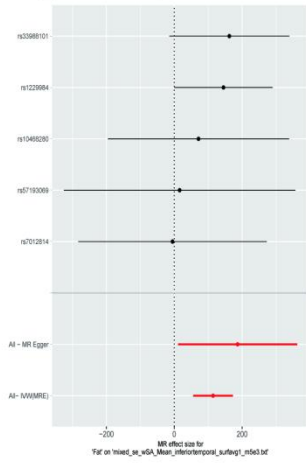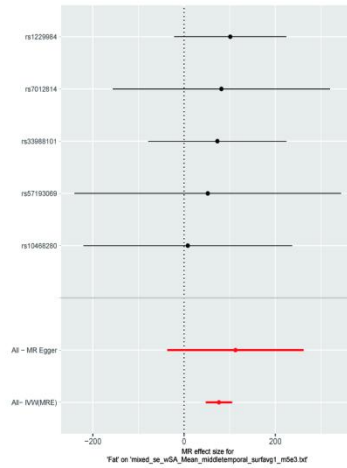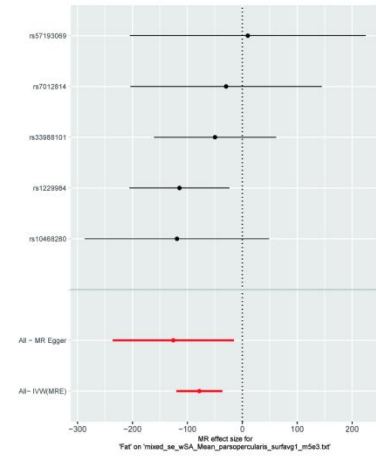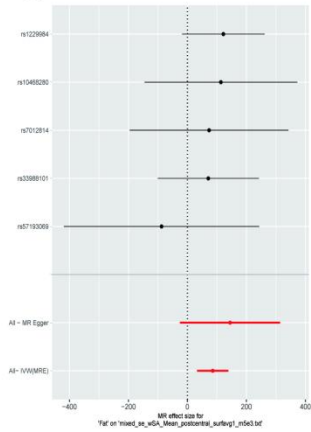Figure3.forest plots of food type to cortical regions.
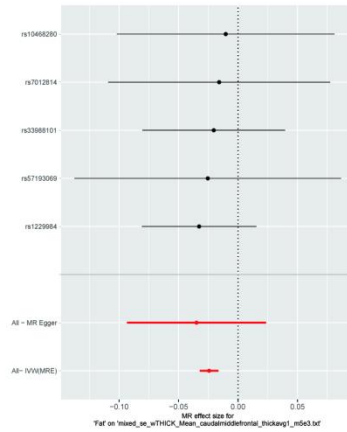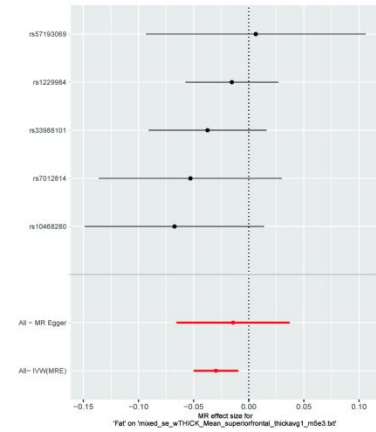(A) Fat

wSA_inferiortemporal

SA_middletemporal

SA_parsopercularis

SA_postcentral

THICK_caudalmiddlefrontald-lefrontal

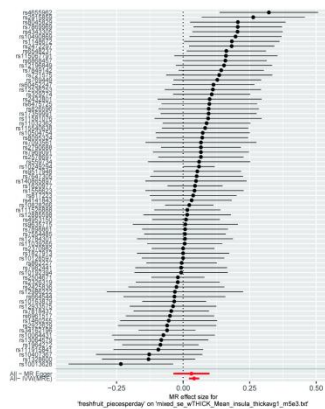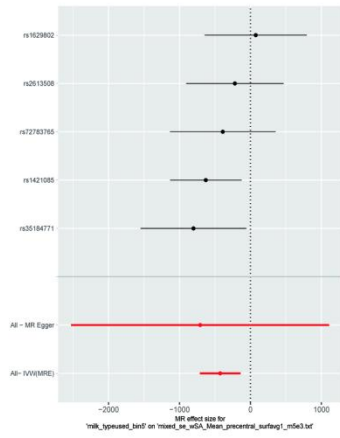THICK_superiorfrontal

(B) freshfruit_piecesperday

THICK_Mean_insula

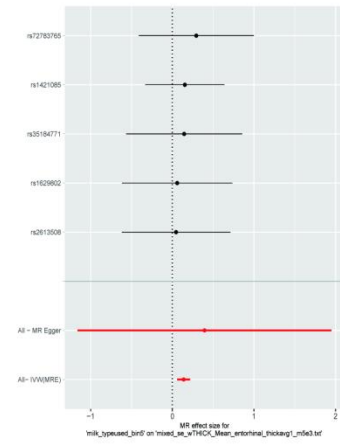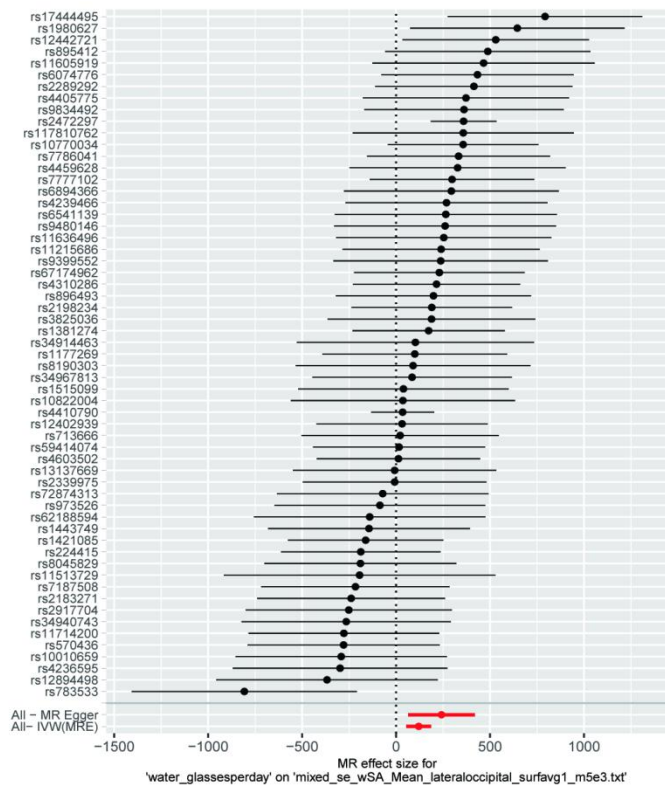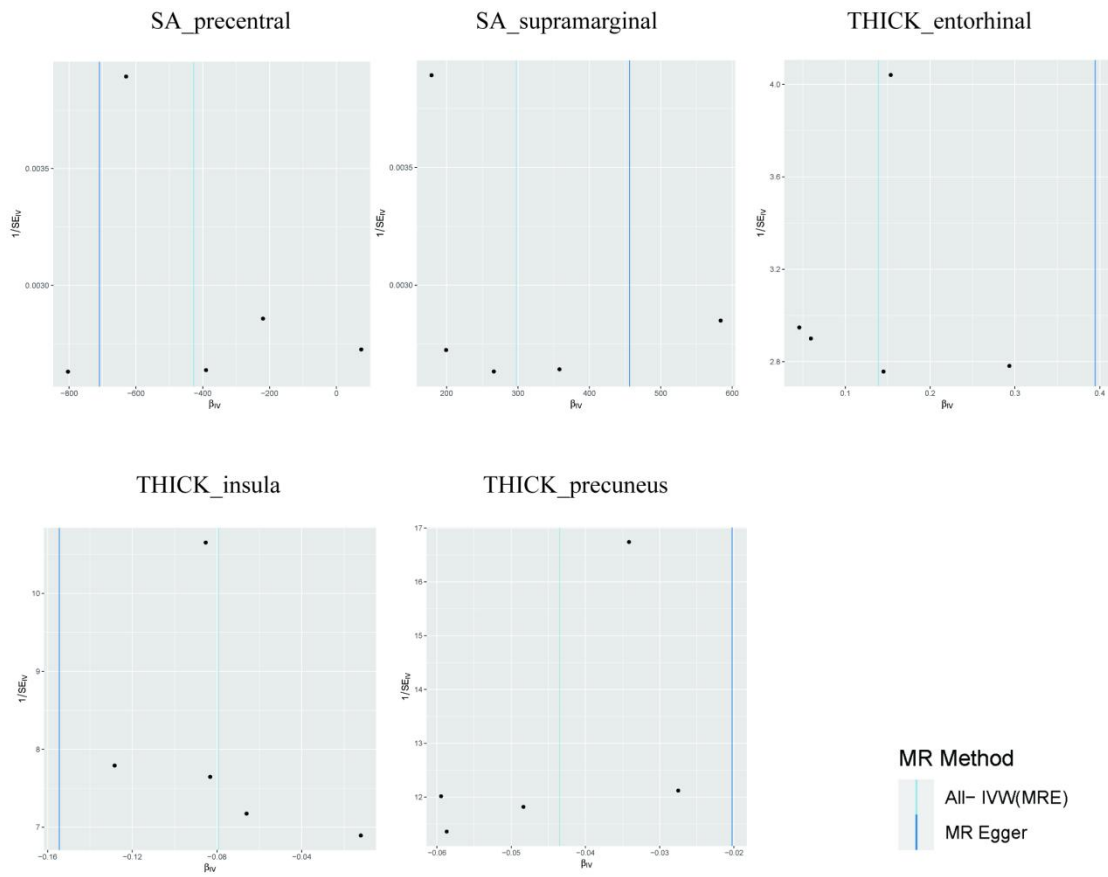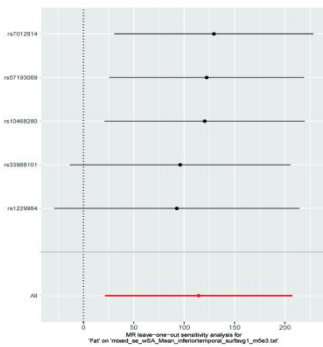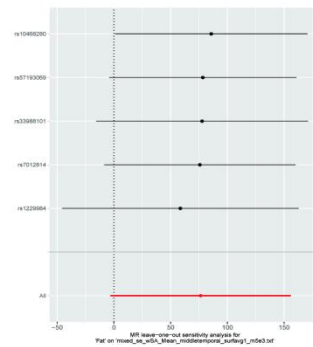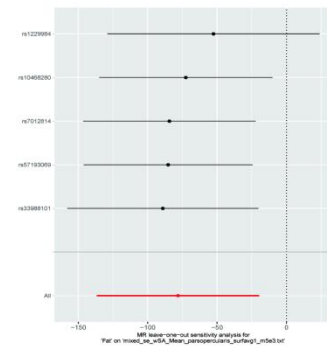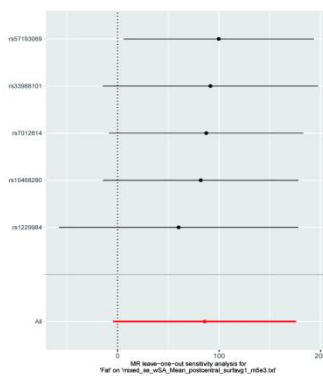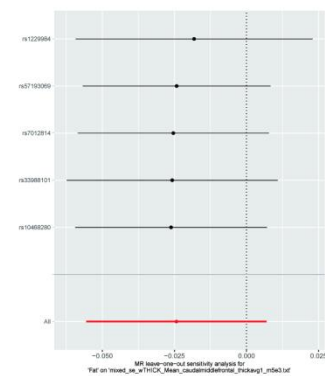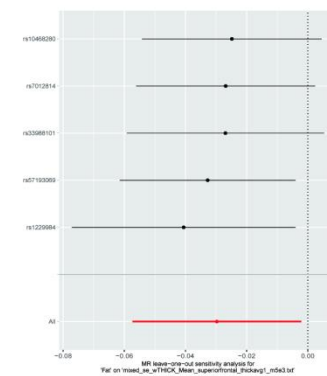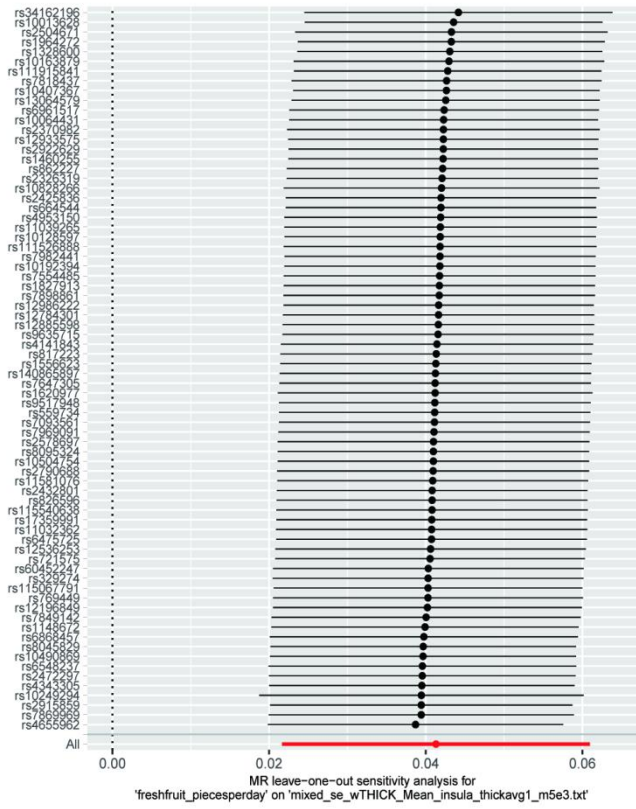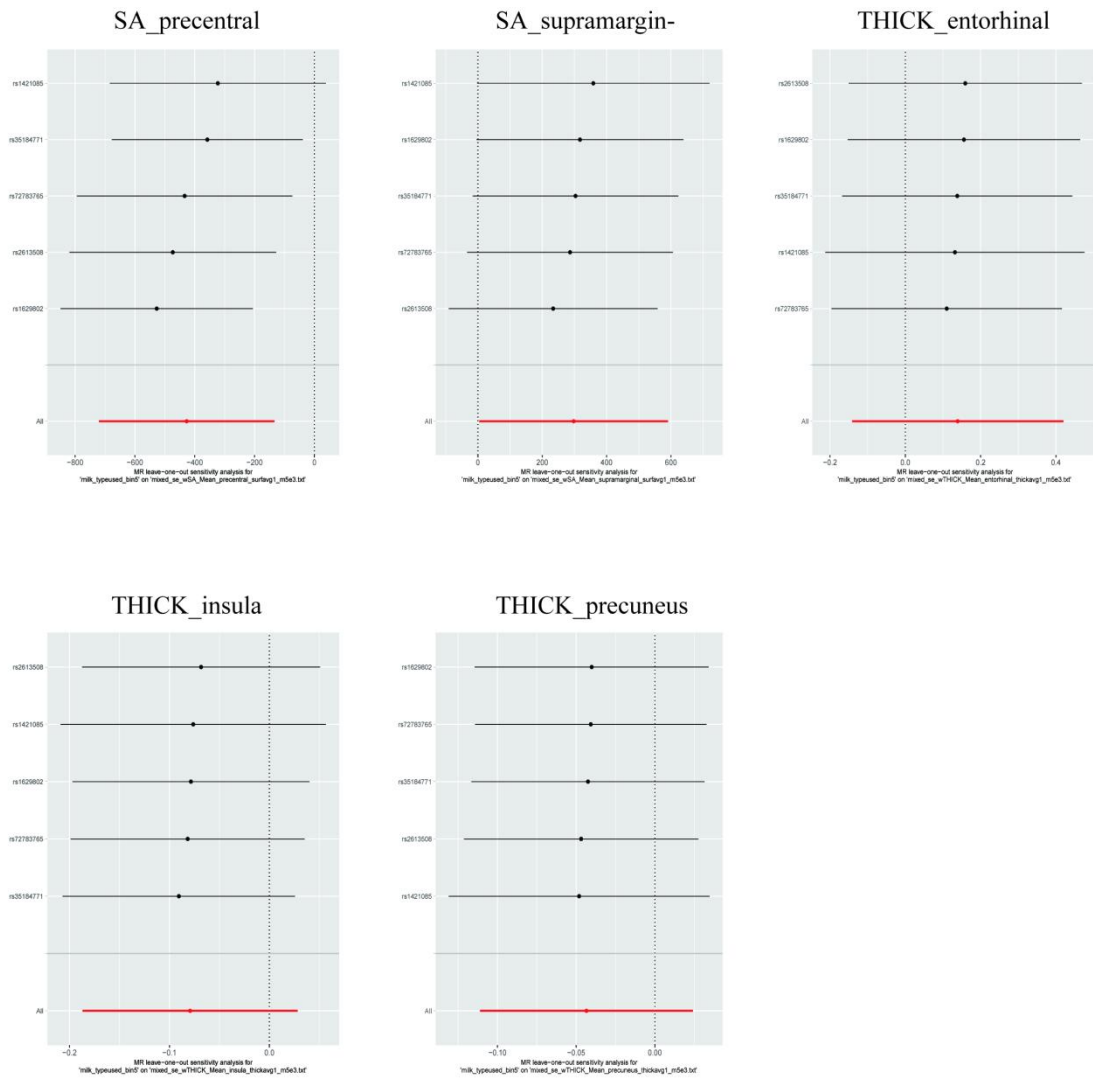## (C) milk_typeused_bin5

SA_precentral

MR effect size for
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SA_supramarginal

MR effect size for
'milk_typeused_bin5' on 'mixed_se_wSA_Mean_supramarginal_surfavg1_m5e3.txt'

THICK_entorhinal

MR effect size for
'milk_typeused_bin5' on 'mixed_se_wTHICK_Mean_entorhinal_thickavg1_m5e3.txt'

THICK_insula

MR effect size for
'milk_typeused_bin5' on 'mixed_se_wTHICK_Mean_insula_thickavg1_m5e3.txt'

THICK_pre cuneus

MR effect size for
'milk_typeused_bin5' on 'mixed_se_wTHICK_Mean_precuneus_thickavg1_m5e3.txt'
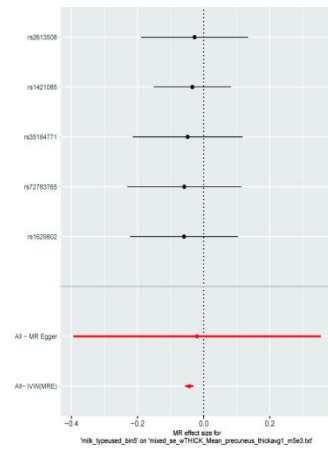
(D) milk_typeused_bin9

SA_lingual

SA_precentral

SA_superiorfrontal

THICK_entorhinal

(E) Protein

THICK_frontalpole

(F) water_glassesperday
SA_lateraloccipital

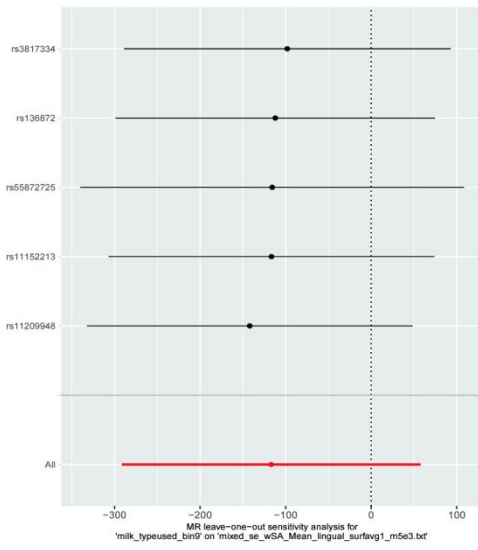Figure4.funnel plots of food type to cortical regions.
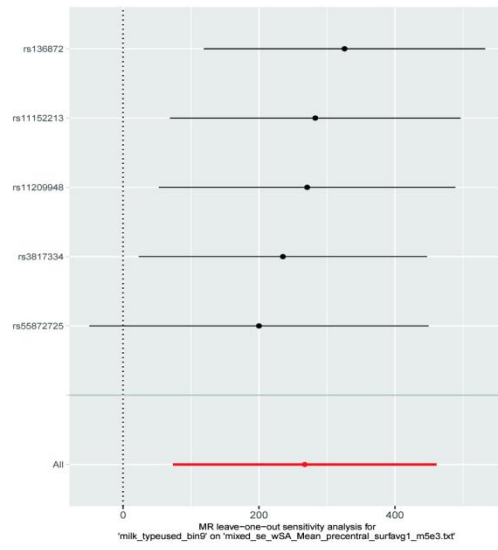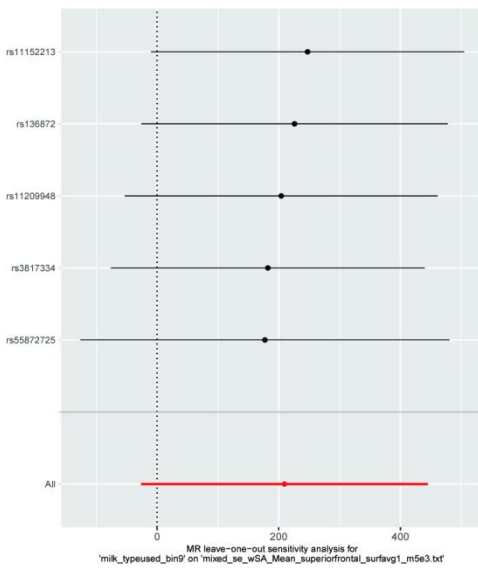(A) Fat

(B) freshfruit_piecesperday
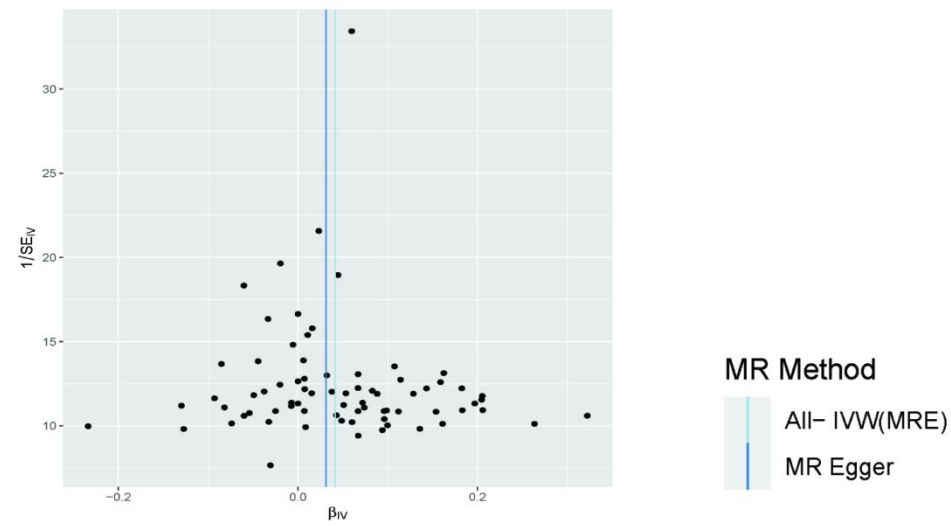
(C) milk_typeused_bin5

(D) milk_typeused_bin9

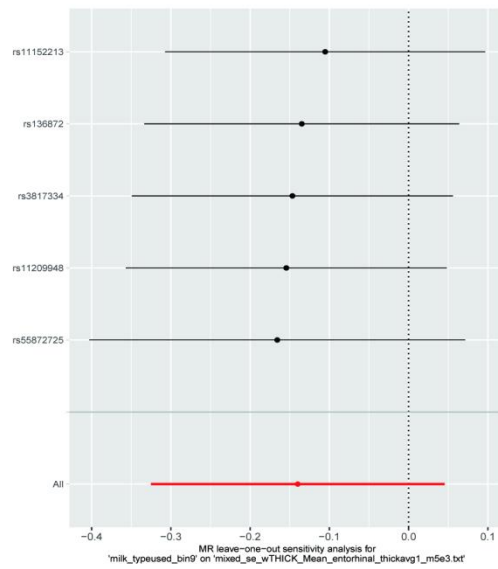SA_lingual SA_precentral SA_superiorfrontal THICK_entorhinal
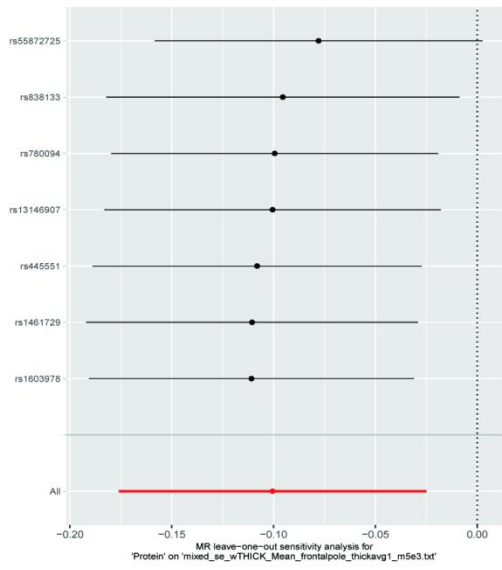
(E) Protein

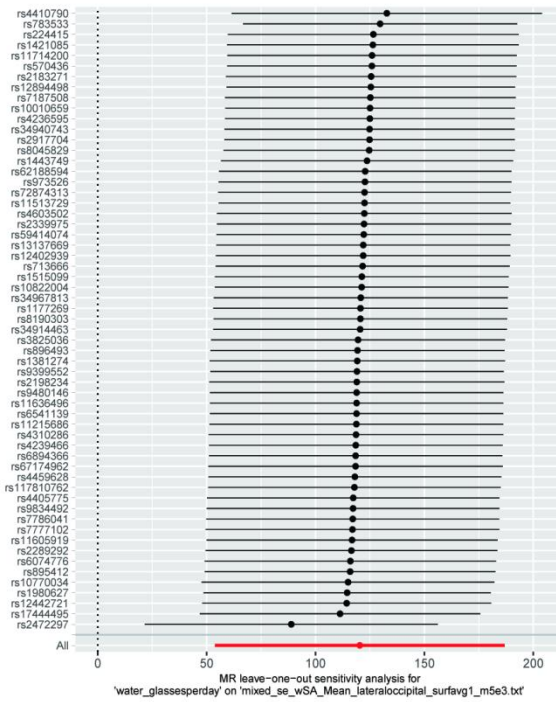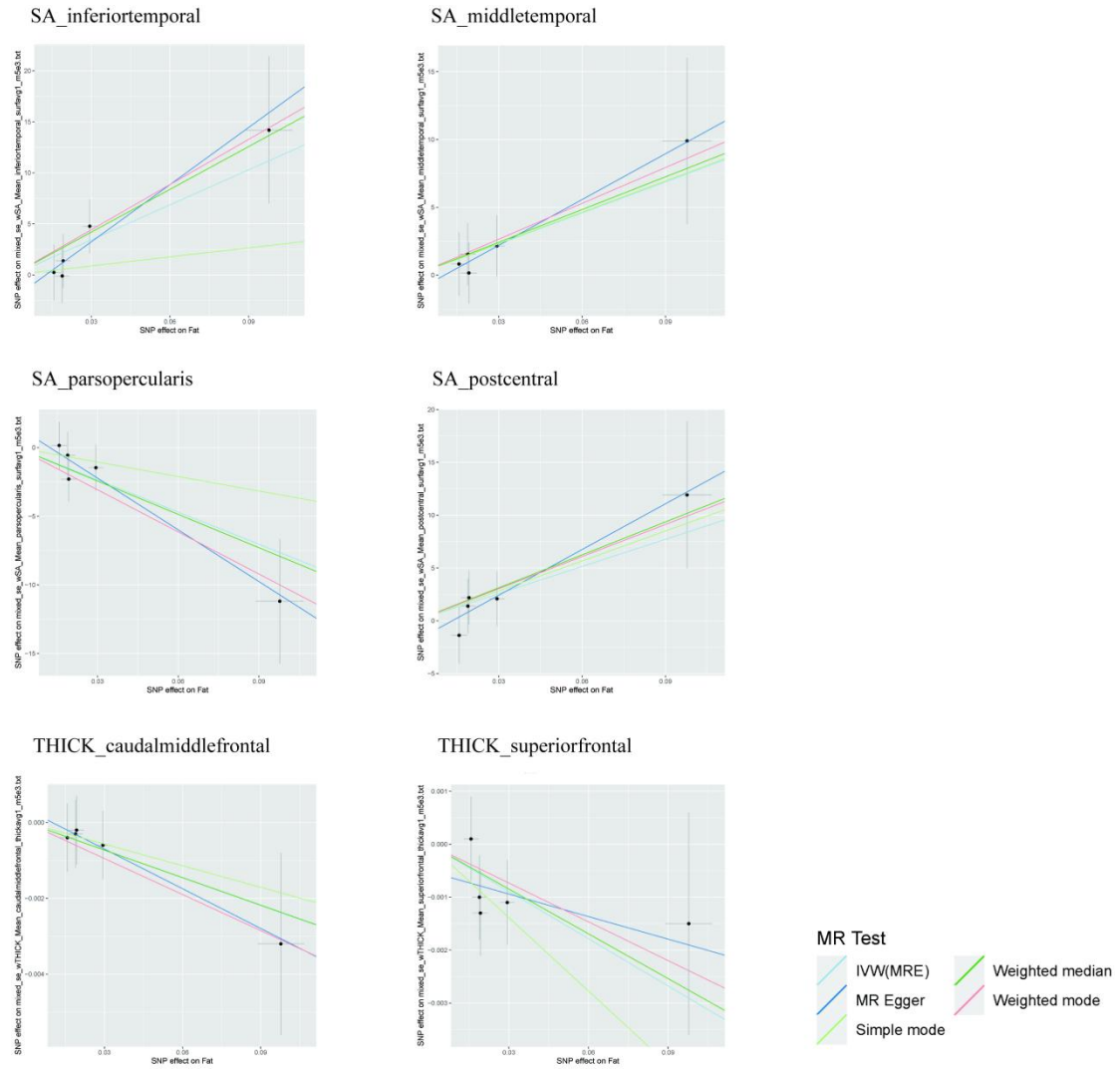THICK_frontalpole

(F) water_glassesperday

SA_lateraloccipital
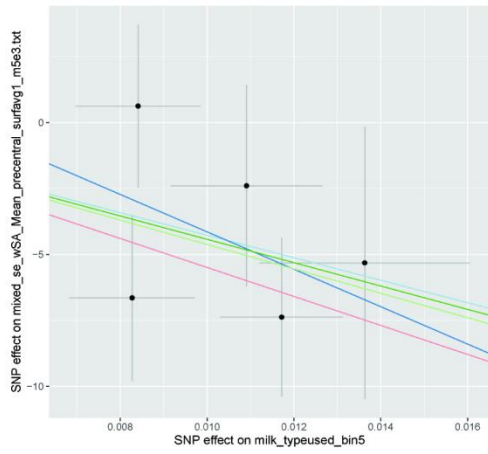

Figure5.leave-one-out plots of food type to cortical regions.
(A) Fat

(B) freshfruit_piecesperday

THICK_insula

MR leave-one-out sensitivity analysis for
'freshfruit_piecesperday' on 'mixed_se_wTHICK_Mean_insula_thickavg1_m5e3.txt'
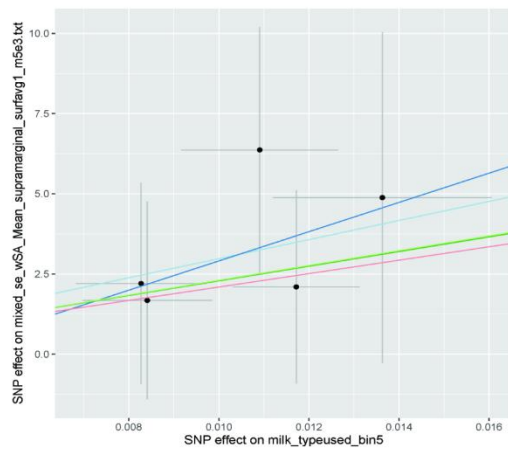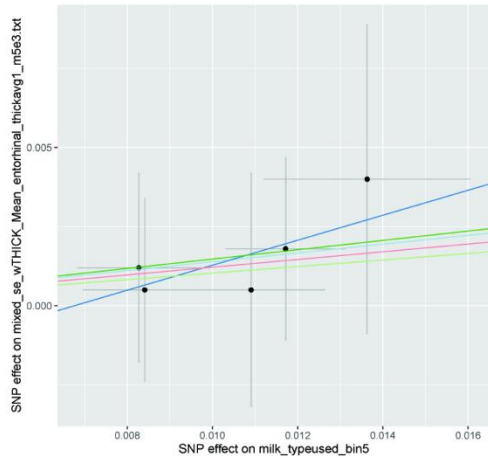
(C) milk_typeused_bin5

SA_precentral
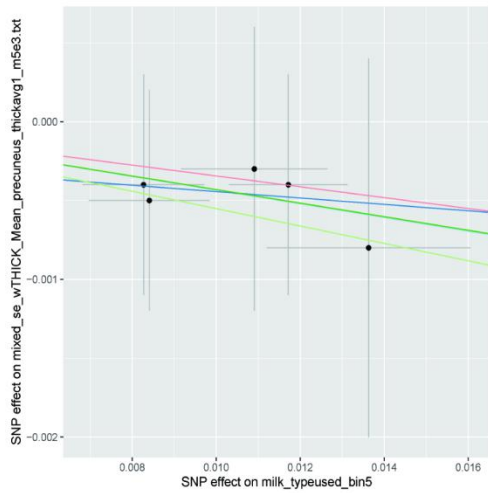
SA_supramargin-

THICK_entorhinal

THICK_insula

THICK_precuneus

(D) milk_typeused_bin9

SA_lingual

SA_precentral

SA_superiorfrontal

THICK_entorhinal

(E) Protein

THICK_frontalpole

(F) water_glassesperday

SA_lateraloccipital

Figure6.scatter plots of food type to cortical regions.

(A) Fat

SA_inferiortemporal

SA_middletemporal

SA_parsopercularis

SA_postcentral

THICK_caudalmiddlefrontal

THICK_superiorfrontal

MR Test

IVW(MRE)

MR Egger

Simple mode

Weighted median

Weighted mode

(B) freshfruit_piecesperday
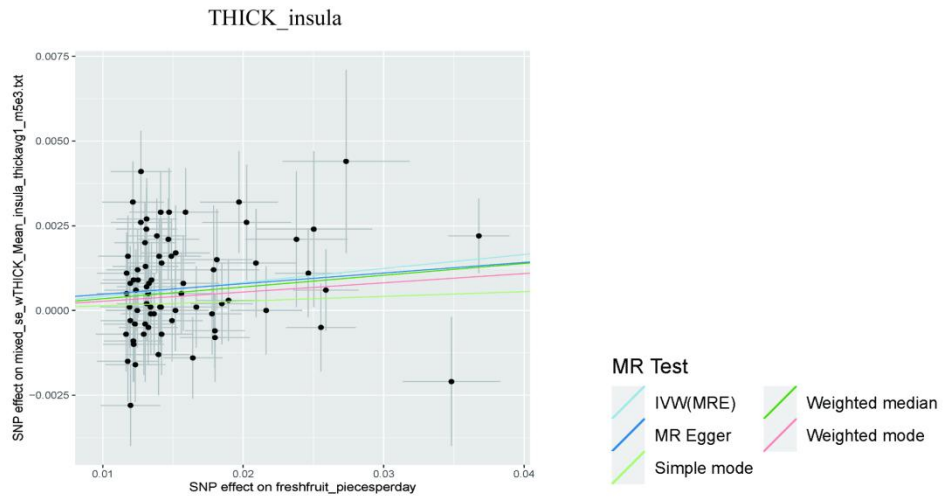
THICK_insula

(C) milk_typeused_bin5

SA_precentral

SA_supramarginal

THICK_entorhinal

THICK_insula
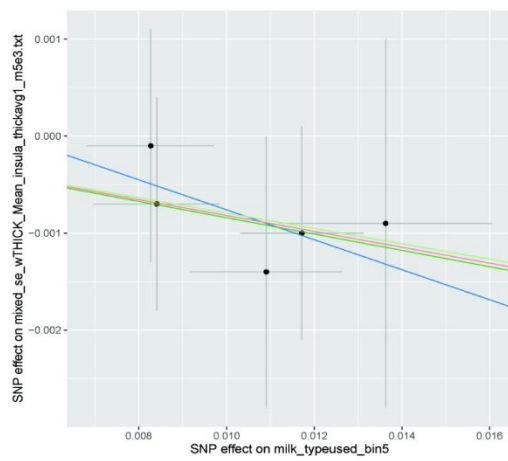
THICK_precuneus

MR Test

IVW(MRE)

MR Egger

Simple mode

Weighted median

Weighted mode

(D) milk_typeused_bin9

SA_lingual   SA_precentral

SA_superiorfrontal   THICK_entorhinal

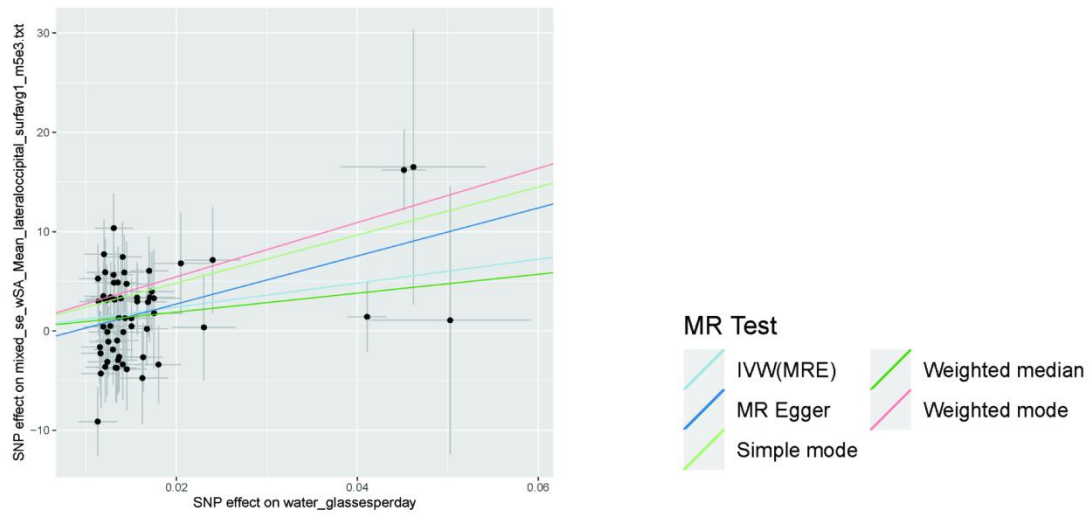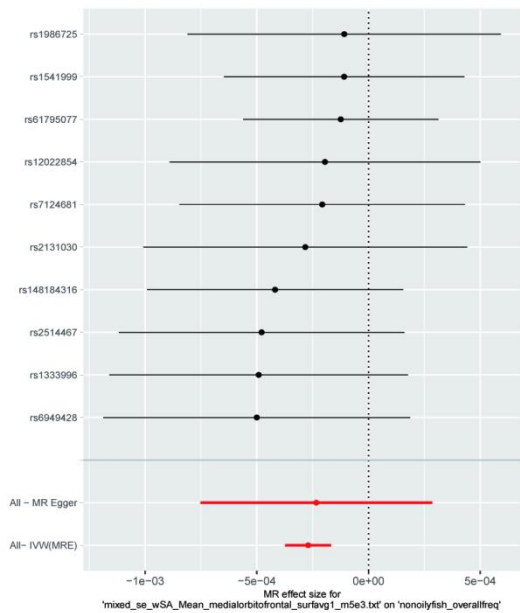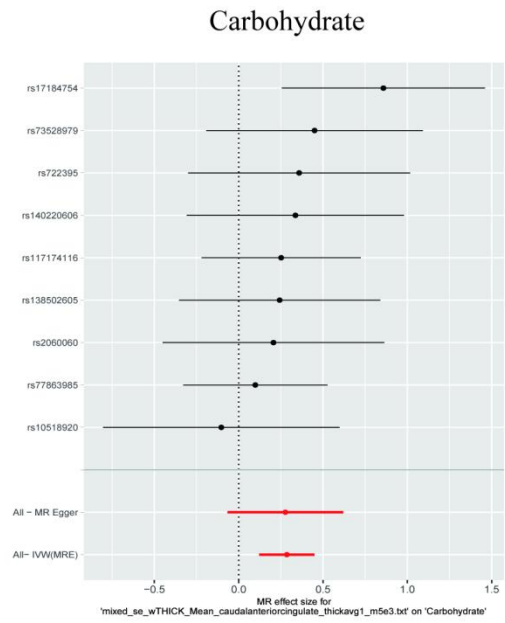(E) Protein

THICK_frontalpole
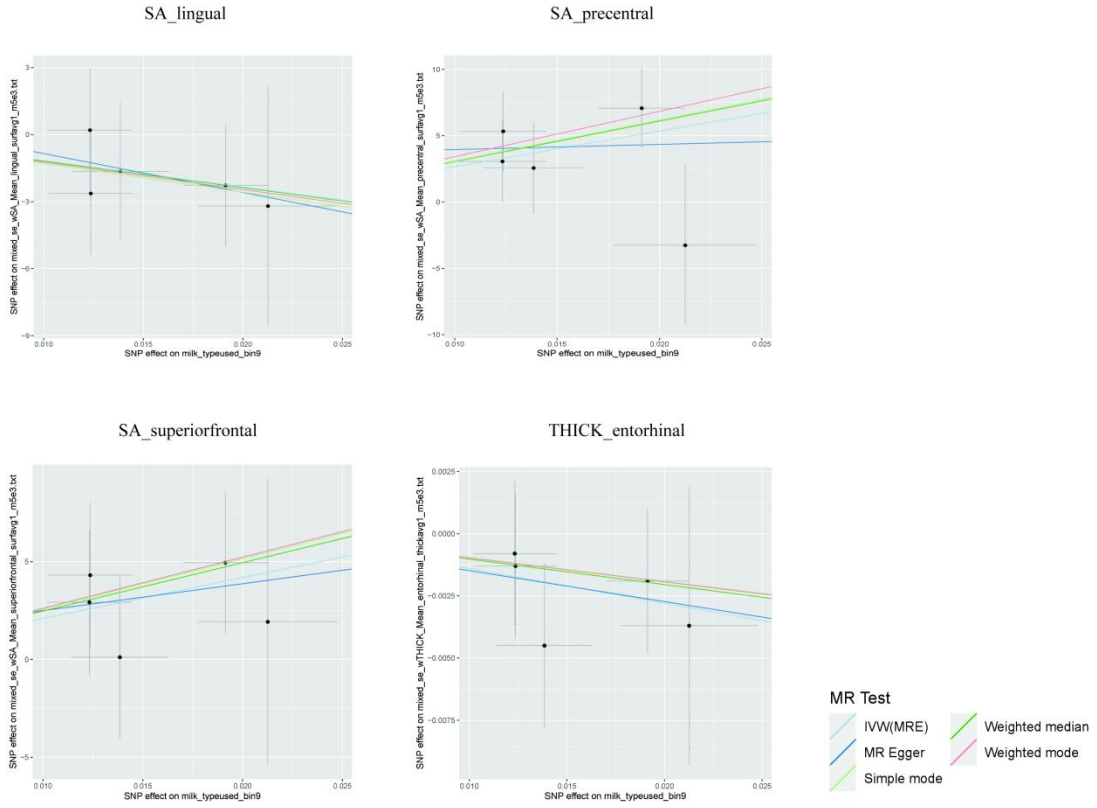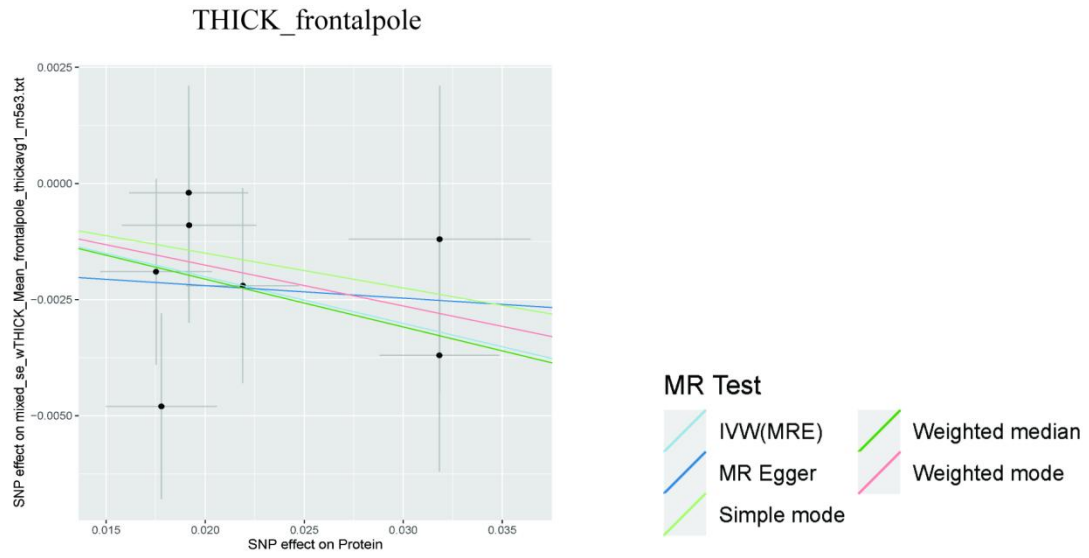
(F) water_glassesperday

SA_lateraloccipital
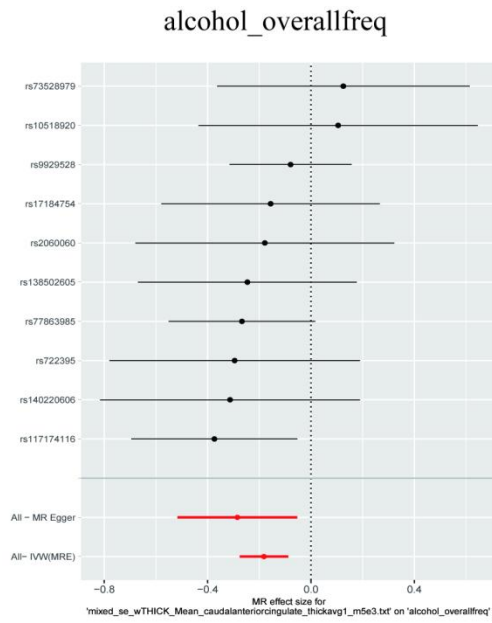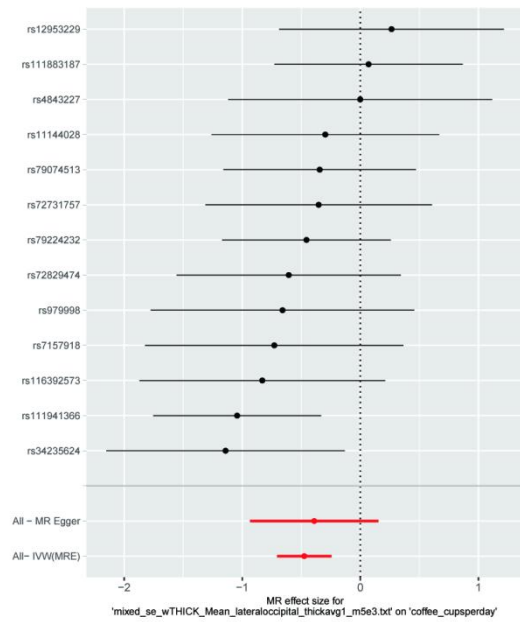
Figure7.reverse forest plots of cortical regions to food type.
(A) SA_medialorbitofrontal

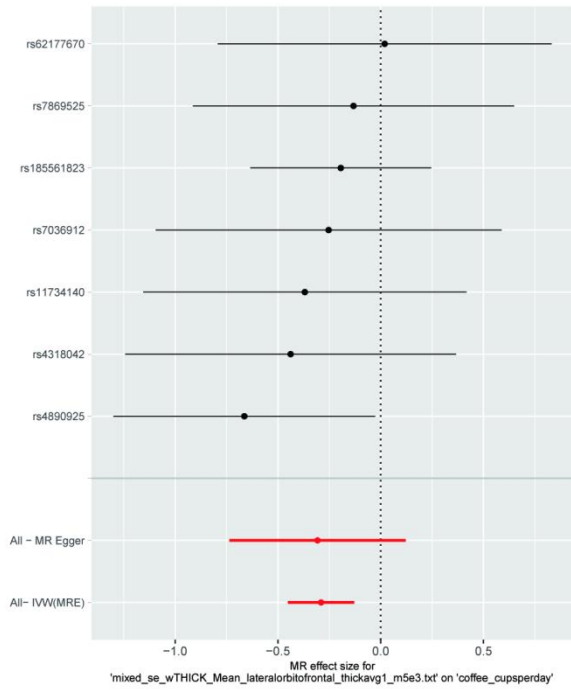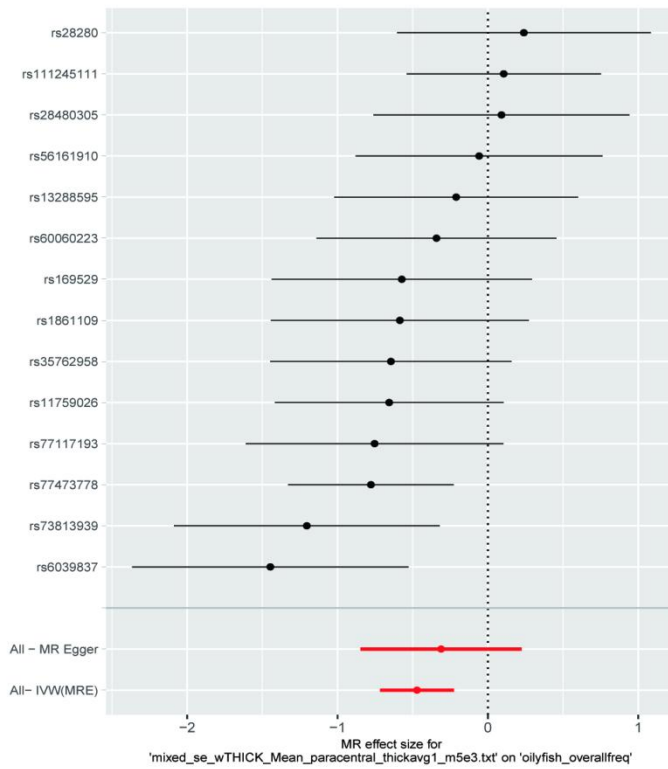
nonoilyfish_overallfreq

(B) THICK_caudalanteriorcingulate

alcohol_overallfreq

Carbohydrate

(C) THICK_lateraloccipital

coffee_cupsperday

(D) THICK_lateralorbitofrontal

coffee_cupsperday

MR effect size for
'mixed_se_wTHICK_Mean_lateralorbitofrontal_thickavg1_m5e3.txt' on 'coffee_cupsperday'

(E) THICK_paracentral

oilyfish_overallfreq

MR effect size for
'mixed_se_wTHICK_Mean_paracentral_thickavg1_m5e3.txt' on 'oilyfish_overallfreq'

Figure8.funnel plots of cortical regions to food type.
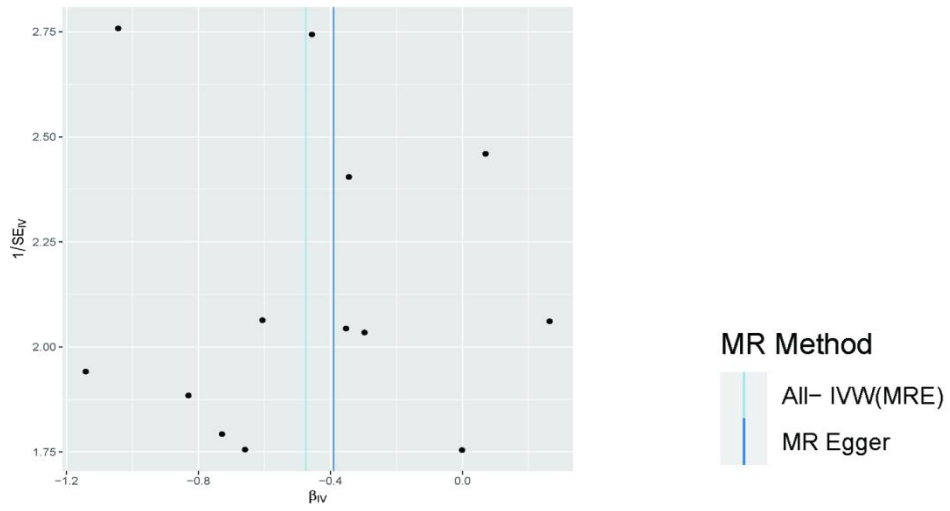(A) SA_medialorbitofrontal

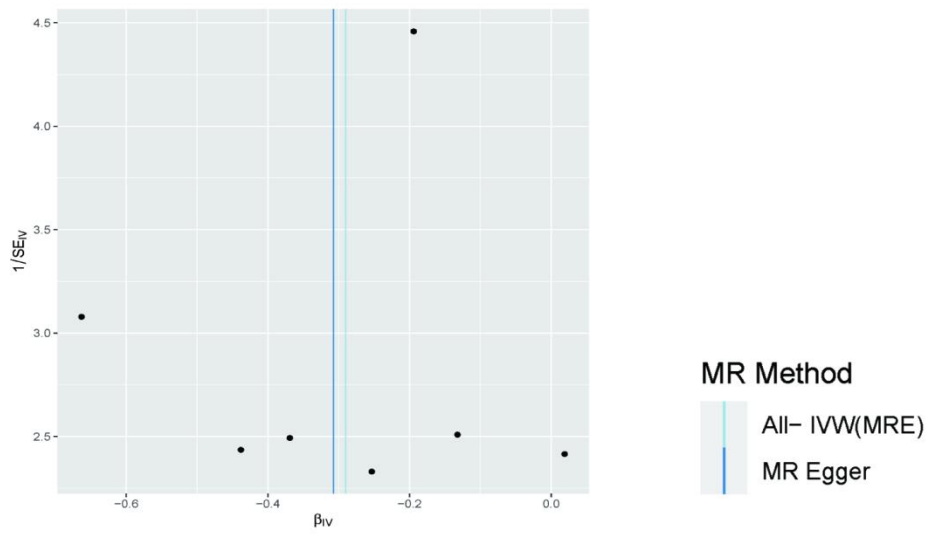nonoilyfish_overallfreq
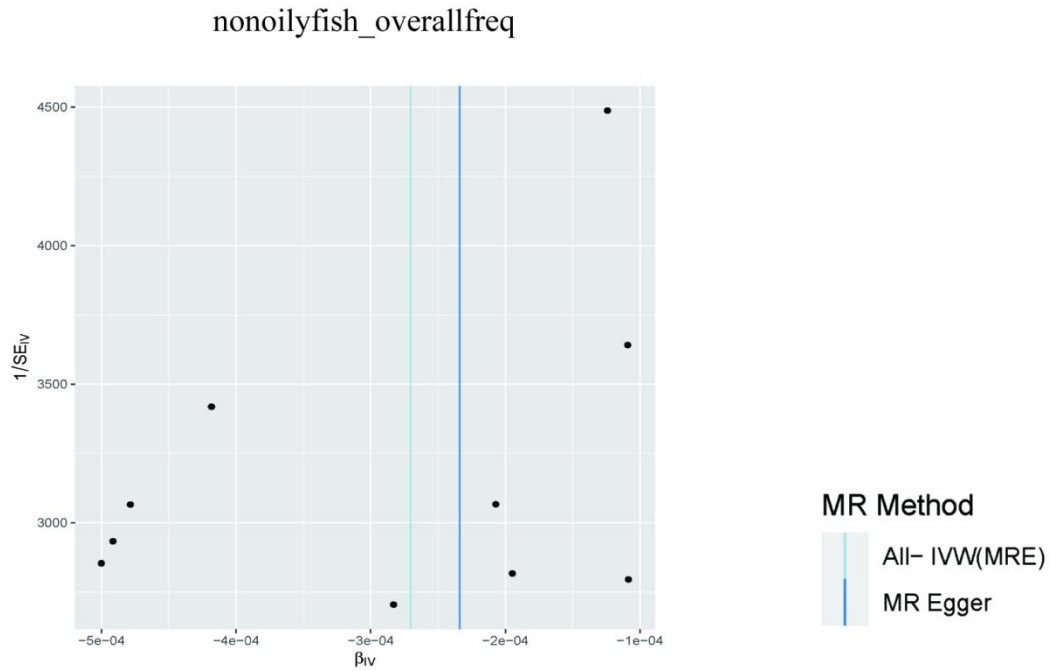
(B) THICK_caudalanteriorcingulate

(C) THICK_lateraloccipital

coffee_cupsperday

(D) THICK_lateralorbitofrontal

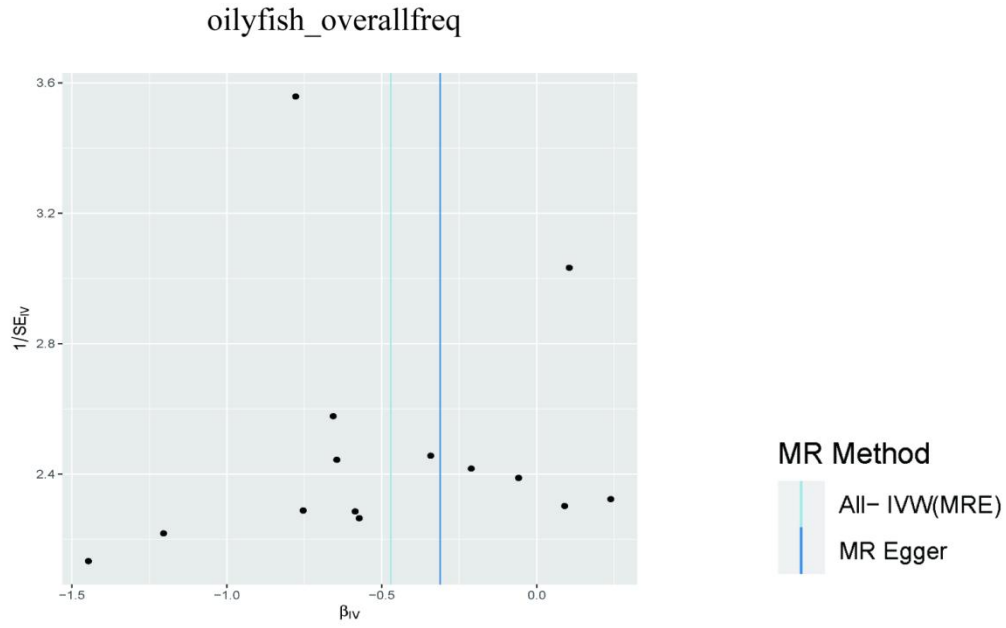coffee_cupsperday

(E) THICK_paracentral

oilyfish_overallfreq
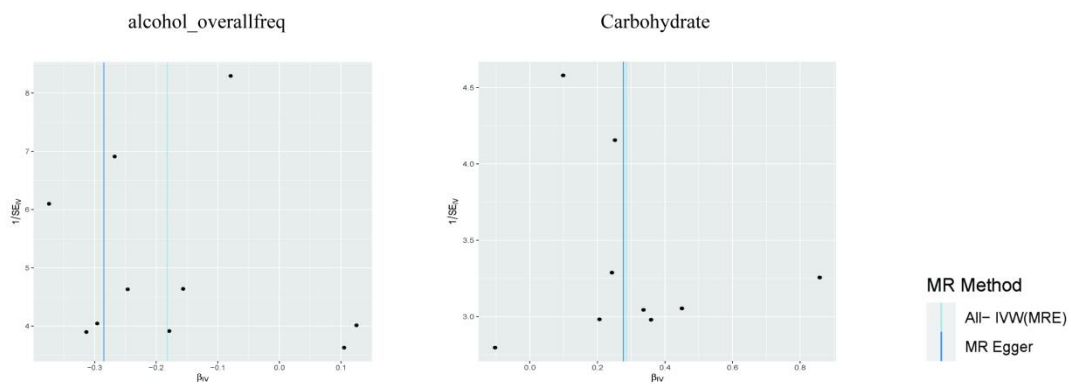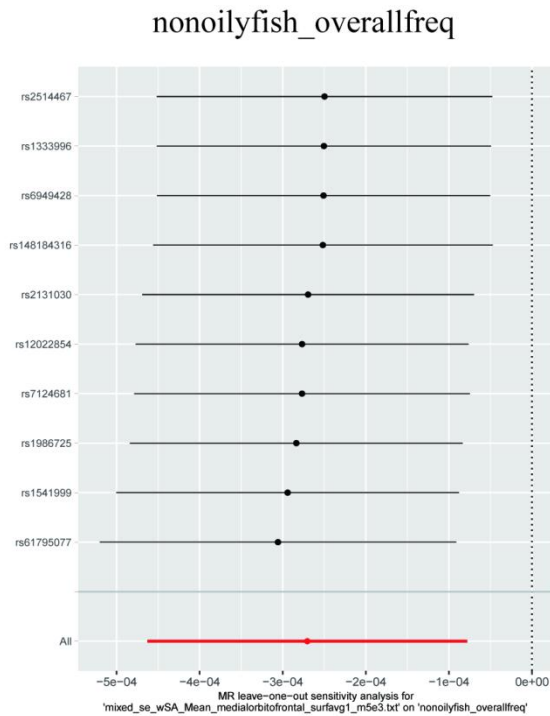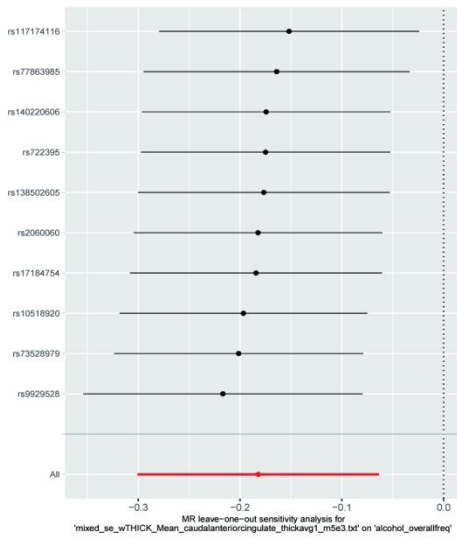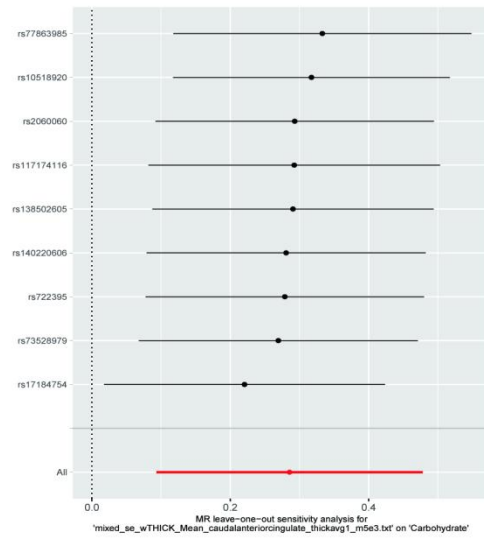
Figure9.leave-one-out plots of cortical regions to food type.
(A) SA_medialorbitofrontal

nonoilyfish_overallfreq
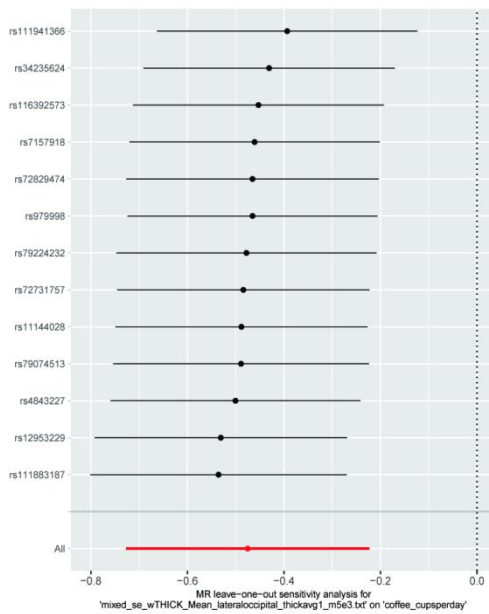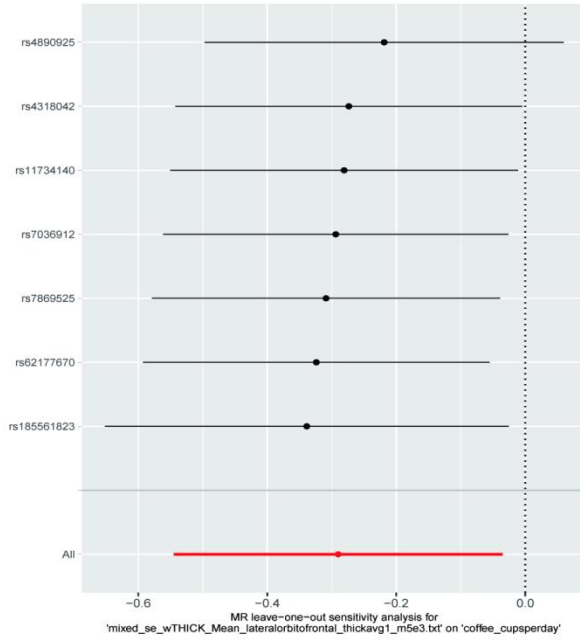
(B) THICK_caudalanteriorcingulate

alcohol_overallfreq

Carbohydrate

(C) THICK_lateraloccipital

coffee_cupsperday

(D) THICK_lateralorbitofrontal

coffee_cupsperday

MR leave−one−out sensitivity analysis for
'mixed_se_wTHICK_Mean_lateralorbitofrontal_thickavg1_m5e3.txt' on 'coffee_cupsperday'

(E) THICK_paracentral

oilyfish_overallfreq

MR leave−one−out sensitivity analysis for
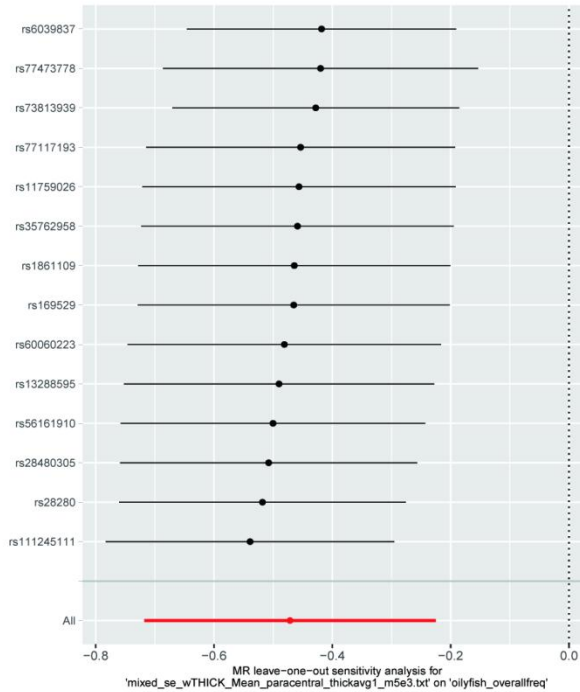'mixed_se_wTHICK_Mean_paracentral_thickavg1_m5e3.txt' on 'oilyfish_overallfreq'

Figure10.scatter plots of cortical regions to food type.
(A) SA_medialorbitofrontal

nonoilyfish_overallfreq

(B) THICK_caudalanteriorcingulate

alcohol_overallfreq   Carbohydrate

(C) THICK_lateraloccipital

coffee_cupsperday

(D) THICK_lateralorbitofrontal

coffee_cupsperday
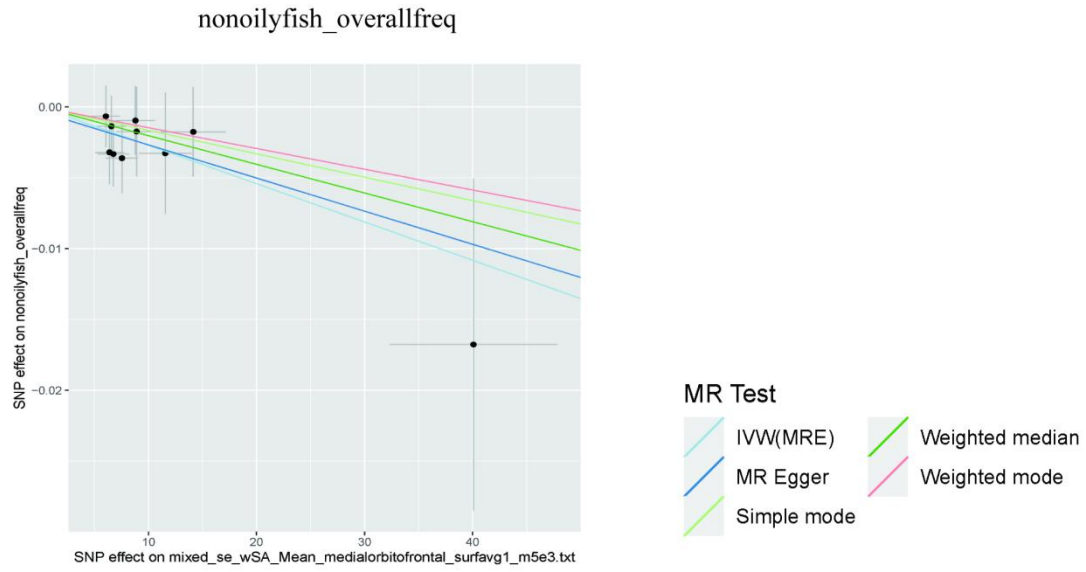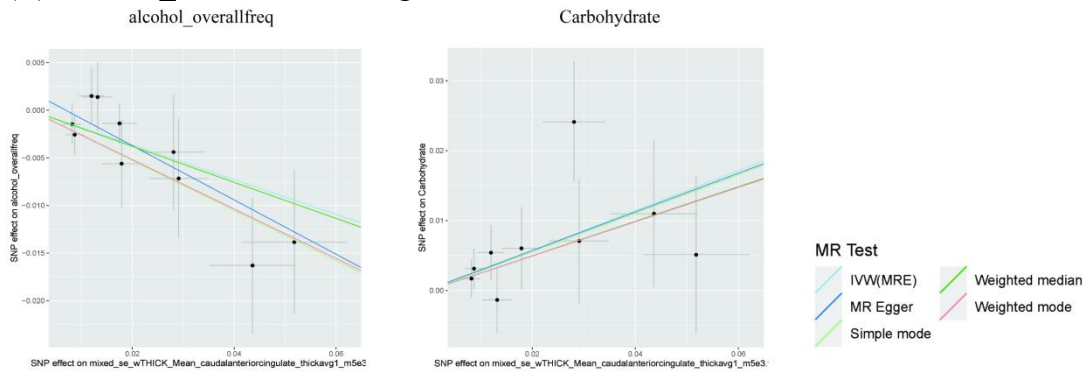
(E) THICK_paracentral

oilyfish_overallfreq