Supplement

Title: The role of diet in the prevention of diabetes: An umbrella review of meta-analyses of observational and interventional studies

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Keywords type 2 diabetes, diet, nutrition, dietary pattern, dietary behaviour, food group, food, beverage, macronutrient, micronutrient, umbrella review

Supplementary Table 1: Search term

((diet OR dietetic OR diets OR dietary) OR (nutrition OR nutrient) OR (food OR food group OR food cluster) OR beverage) OR (bread OR cereal OR grain OR corn OR wholegrain OR soy OR soya OR whole wheat OR potatoes OR granary OR tuber OR tubers OR pulses OR legumes OR lentils OR beans OR chickpeas OR rice OR pasta OR quinoa OR vegetable OR vegetables OR fruit OR fruits OR milk OR dairy OR dairy products OR yoghurt OR cheese OR egg OR eggs OR meat OR pork OR lamb OR chicken OR beef OR turkey OR duck OR fish OR seafood OR shellfish OR oil OR butter OR margarine OR nut OR nuts OR desert OR sweets OR sweetened OR candy OR sugar*) OR (alcohol OR caffeine OR coffee OR tea OR juice OR beer OR lemonade OR drinks OR drinking OR wine OR liquor OR "sugar sweetened beverage") OR (macronutrient* OR fat OR "fatty acids" OR carbohydrate* OR fibre OR fiber OR starch OR sugar OR fructose OR protein) OR ((micronutrient* OR vitamin* OR mineral OR minerals))
AND
(diabetes)
AND
("systematic review" OR meta-analysis)

Supplementary Table 2: List of excluded studies

Reason for exclusion
Not relevant outcome[1-25]
Not relevant exposure[26-41]
Meta-analyses of studies other than prospective cohort studies[42-45]
No meta-analysis[46-102]
No systematic literature search[103-107]
Abstract[108-135]
Duplicate[136-139]
Comment[140-145]
Protocol[146-149]
Editorial[150]
Meta-analysis on the same topic[151-217]

Supplemental Table 3: Characteristics of the conducted meta-analyses and results of the recalculation, the methodological assessment (AMSTAR) and the assessment of quality of evidence (NutriGrade) by exposure

Exposure	Reference	No. of primary studies	Comparison	Range / Amount	No. of participants / No. of cases	SHR (95%-CI)	p-value	I^2	T^2	95%-PI	Egger's p-value	AMSTAR	NutriGrade
Dietary behaviours/diet quality indices													
Healthy dietary pattern	Esposito 2014[218]	18	High v low	Higher adherence v lower adherence	446'213 / 21'566	0.79 (0.74 to 0.85)	0.000	54.1%	0.0106	0.62 to 0.99	0.87	8	Moderate
Unhealthy dietary pattern	Alhazmi 2014[219]	10	High v low	Higher adherence v. lower adherence	291'406 / 19'149	1.44 (1.33 to 1.56)	0.000	3.0%	0.0006	1.29 to 1.61	0.26	9	Moderate
Healthy eating index (HEI)	Schwingshackl 2017[220]	3	High v low	Higher adherence v lower adherence	262'184 / NA	0.86 (0.79 to 0.93)	0.000	76.7%	0.0037	0.32 to 2.17	0.89	9	Low
Alternative healthy eating index (AHEI)	Schwingshackl 2017[220]	9	High v low	Higher adherence v lower adherence	564'048 / NA	0.79 (0.73 to 0.85)	0.000	78.3%	0.0095	0.62 to 1.01	0.52	9	Moderate
Dietary Approach to Stop Hypertension (DASH)	Schwingshackl 2017[220]	7	High v low	Higher adherence v lower adherence	258'893 / NA	0.80 (0.73 to 0.88)	0.000	67.4%	0.0072	0.63 to 1.03	0.66	9	Low
Mediterranean Diet	Koloverou 2014[221]	9	High v low	Higher adherence v lower adherence	135'168 / 19'609	0.85 (0.76 to 0.95)	0.004	59.0%	0.0131	0.63 to 1.15	0.66	9	Low
Vegetarian diet	Lee & Park 2017[222]	2	High v low	Vegetarian v Omnivores	49'788 / NA	0.67 (0.54 to 0.84)	0.000	58.3%	0.0158	NE (< 3 studies)	NA	7	Low
Low carbohydrate diet	Namazi 2017[223]	4	High v low	Higher adherence v lower adherence	130'515 / 8081	1.17 (0.90 to 1.51)	0.25	81.5%	0.0478	0.39 to 3.51	0.82	8	Very low
Breakfast skipping	Bi 2015[224]	4	High v low	Everyday v Never	81'666 / 4197	1.21 (1.12 to 1.31)	0.000	0.0%	0.0000	1.02 to 1.44	0.10	8	Low
Glycemic Index	Bhupathiraju 2014[225]	13	High v low	NA	NA / 35'715	1.13 (1.03 to 1.24)	0.01	77.8%	0.0204	0.81 to 1.58	0.17	8	Low
Glycemic Load	Bhupathiraju 2014[225]	17	High vs low	NA	NA / 46'115	1.11 (1.05 to 1.17)	0.000	36.0%	0.0040	0.96 to 1.29	0.15	8	Moderate
Dietary acid load*	Jayedi 2018	6	Dose-response	Per 5 units/d	319'542 / 17'983	1.04 (1.02 to 1.07)	NA	79.2%	NA	NA	NA	9	Moderate

SHR = Summary hazard ratio, NA = not available

Supplemental Table 3 continued…

Exposure	Reference	No. of primary studies	Comparison	Range / Amount	No. of participants / No. of cases	SHR (95%-CI)	p-value	I^2	T^2	95%-PI	Egger's p-value	AMSTAR	NutriGrade
Food groups and foods													
Total dairy	Schwingshackl 2017[226]	21	Dose-response	per 200 g/d	566'872 / 44'474	0.96 (0.94 to 0.99)	0.002	74.5%	0.0013	0.89 to 1.04	0.02	9	Moderate
Low-fat dairy products	Gijsbers 2016[227]	13	Dose-response	per 200 g/d	405'667 / 27'597	0.96 (0.92 to 1.00)	0.07	66.0%	0.0032	0.84 to 1.10	0.11	8	Low
High-fat dairy products	Gijsbers 2016[227]	13	Dose-response	per 200 g/d	327'895 / 24'034	0.98 (0.93 to 1.04)	0.55	53.3%	0.0038	0.85 to 1.14	0.93	8	Low
Milk	Gijsbers 2016[227]	10	Dose-response	per 200 g/d	140'787 / 16722	0.99 (0.94 to 1.03)	0.53	49.0%	0.0021	0.87 to 1-11	0.02	8	Low
Low-fat milk	Gijsbers 2016[227]	7	Dose-response	per 200 g/d	267'607 / 20'098	1.01 (0.98 to 1.05)	0.51	73.4%	0.0013	0.91 to 1.13	0.05	7	Low
High-fat milk	Gijsbers 2016[227]	9	Dose-response	per 200 g/d	336'080 / 21'995	0.99 (0.88 to 1.11)	0.82	84.9%	0.0210	0.68 to 1.43	0.80	8	Low
Yogurt	Gijsbers 2016[227]	11	Dose-response	per 50 g/d	438'140 / 36'125	0.94 (0.91 to 0.98)	0.001	76.1%	0.0022	0.83 to 1.05	0.18	8	Moderate
Cheese	Gijsbers 2016[227]	12	Dose-response	per 10 g/d	369'697 / 32'936	1.00 (0.99 to 1.02)	0.68	60.5%	0.0004	0.96 to 1.05	0.72	8	Low
Cottage cheese	Aune 2013[228]	2	High v low Intake	≥2 s/wk v <1 s/mo	78'437 / 2846	0.91 (0.79 to 1.04)	0.18	0.0%	0.0000	NE (< 3 studies)	NA	6	Very low
Fermented dairy products	Gao 2013[229]	3	High v low intake	260 g v 13 g	33'893 / 11'181	0.94 (0.75 to 1.17)	0.60	43.4%	0.0172	0.10 to 8.47	0.69	8	Low
Cream	Gijsbers 2016[227]	5	Dose-response	per 5 g/d	258'571 / 19'619	0.99 (0.97 to 1.01)	0.26	28.3%	0.0001	0.94 to 1.04	0.33	7	Low
Ice cream	Gijsbers 2016[227]	5	Dose-response	per 10 g/d	258'571 / 19'619	0.93 (0.89 to 0.97)	0.002	85.8%	0.0022	0.79 to 1.10	0.85	7	Low
Sherbet	Gijsbers 2016[227]	4	Dose-response	per 10 g/d	231'641 / 16'759	1.00 (0.97 to 1.03)	0.91	44.3%	0.0003	0.90 to 1.10	0.84	7	Low
Chocolate*	Yuan 2017[230]	5	Dose-response	Per 2 s/week	132'845 / 13'271	0.75 (0.63 to 0.89)	-	NA	NA	NA	-	8	Moderate
Eggs	Schwingshackl 2017[226]	13	Dose-response	per 50 g/d	315'358 / 17'629	1.08 (0.95 to 1.22)	0.27	77.3%	0.0350	0.70 to 1.66	0.42	9	Low
Total meat	Feskens 2013[231]	8	Dose-response	per 100 g/d	457'324 / 7'999	1.12 (1.01 to 1.24)	0.03	73.5%	0.0136	0.85 to 1.47	0.76	3	Moderate
Red meat	Schwingshackl 2017[226]	14	Dose-response	per 100 g/d	550'342 / 43'781	1.17 (1.08 to 1.26)	0.000	82.8%	0.0142	0.89 to 1.54	0.83	9	High
Processed meat	Schwingshackl 2017[226]	14	Dose-response	per 50 g/d	550'342 / 43'781	1.37 (1.22 to 1.54)	0.000	88.0%	0.0360	0.89 to 2.12	0.12	9	High
Hamburger*	Aune 2009[232]	3	Dose-response	per 1 s/wk	171'059 / 3'620	1.09 (1.02 to 1.16)	NA	55.6%	NA	NA	-	5	Low
Bacon*	Micha 2010[233]	5	Dose-response	per 2 slices/d	311'222 / 8'048	2.07 (1.40 to 3.05)	NA	NA	NA	NA	-	9	High

*summary hazard ratio extracted from published meta-analysis, no re-analysis possible, SHR = Summary hazard ratio, NA = not available

Supplemental Table 3 continued…

Exposure	Reference	No. of primary studies	Comparison	Range / Amount	No. of participants / No. of cases	SHR (95%-CI)	p-value	I^2	T^2	95%-PI	Egger's p-value	AMSTAR	NutriGrade
Hot Dogs*	Micha 2010[233]	4	Dose-response	per 1 piece/d	240'613 / 6'079	1.92 (1.33 to 2.78)	NA	NA	NA	NA	-	9	Moderate
Poultry	Feskens 2013[231]	10	Dose-response	per 100 g/d	45'567 / 2'283	1.05 (0.91 to 1.22)	0.46	0.0%	0.0000	0.42 to 2.66	0.38	2	Low
Processed red meat	Pan 2011[234]	8	Dose-response	per 50 g/d	371'492 / 26'256	1.44 (1.18 to 1.76)	0.000	94.8%	0.0745	0.71 to 2.94	0.51	6	Moderate
Unprocessed red meat	Feskens 2013[231]	10	Dose-response	per 100 g/d	486'142 / 28'991	1.11 (0.97 to 1.28)	0.14	93.6%	0.0432	0.67 to 1.85	0.33	2	Low
Total fish/seafood	Schwingshackl 2017[226]	14	Dose-response	per 100 g/d	582'656 / 37'645	1.11 (0.94 to 1.31)	0.22	84.9%	0.0664	0.62 to 2.01	0.49	9	Low
Lean fish	Zhang 2013[235]	4	High v low intake	166 v 0 g/d	103'949 / 12'899	1.03 (0.89 to 1.20)	0.65	55.7%	0.0124	0.58 to 1.84	0.25	8	Low
Oily fish	Zhang 2013[235]	4	High v low intake	166 v 0 g/d	103'949 / 12'899	0.89 (0.82 to 0.96)	0.004	0.0%	0.0000	0.74 to 1.06	0.27	9	Low
Shellfish	Zhang 2013[235]	3	High v low intake	79.6 v <2.9 g/d	162'953 / 15'399	1.03 (0.83 to 1.28)	0.78	83.3%	0.0309	0.07 to 14.78	0.35	9	Low
Fish	Zhang 2013[235]	7	High v low intake	166 v 0 g/d	419'613 / 26'596	1.01 (0.92 to 1.22)	0.89	67.2%	0.0134	0.72 to 1.40	0.98	9	Low
Butter	Pimpin 2016[236]	4	Dose-response	per 14 g/d	201'628 / 23'954	0.96 (0.93 to 1.00)	0.03	49.6%	0.0007	0.84 to 1.10	0.46	11	Low
Olive oil	Schwingshackl 2017b[237]	4	Dose-response	per 10 g/d	183'370 / 21'688	0.91 (0.87 to 0.96)	0.000	0.0%	0.0000	0.82 to 1.01	0.10	8	Low
Potatoes	Schwingshackl 2018[238]	7	Dose-response	per 150 g/d	360'914 / 18'334	1.18 (1.10 to 1.27)	0.000	30.8%	0.0028	1.00 to 1.39	0.11	7	Low
French fries	Schwingshackl 2018[238]	4	Dose-response	per 150 g/d	222'712 / 16'199	1.66 (1.43 to 1.93)	0.000	0.0%	0.0000	NA	NA	7	Moderate
Boiled/baked/ mashed potatoes	Schwingshackl 2018[238]	4	Dose-response	per 150 g/d	222'712 / 16'199	1.09 (1.01 to 1.18)	0.03	0.0%	0.0000	NA	NA	7	Low
Whole grain	Schwingshackl 2017[226]	12	Dose-response	per 30 g/d	459'603 / 22'267	0.87 (0.82 to 0.93)	0.000	91.0%	0.0105	0.68 to 1.11	0.79	9	High
Refined grain	Schwingshackl 2017[226]	14	Dose-response	per 30 g/d	620'319 / 24'463	1.01 (1.00 to 1.03)	0.34	59.4%	0.0004	0.96 to 1.06	0.65	9	Moderate
Total grains	Aune 2013[239]	4	Dose-response	per 3 s/d	147'466 / 3'541	0.83 (0.75 to 0.92)	0.000	36.1%	0.0035	0.70 to 1.16	0.50	6	Low
Whole grain bread*	Aune 2013[239]	3	Dose-response	per 3 s/d	168'217 / 4'229	0.74 (0.56 to 0.98)	NA	44.1%	NA	NA	-	6	Low
Whole grain cereals*	Aune 2013[239]	3	Dose-response	per 1 s/d	132'661 / 4'978	0.73 (0.59 to 0.91)	NA	80.3%	NA	NA	-	6	Low

*summary hazard ratio extracted from published meta-analysis, no re-analysis possible, SHR = Summary hazard ratio, NA = not available

Supplemental Table 3 continued…

Exposure	Reference	No. of primary studies	Comparison	Range / Amount	No. of participants / No. of cases	SHR (95%-CI)	p-value	I^2	T^2	95%-PI	Egger's p-value	AMSTAR	NutriGrade
Wheat bran*	Aune 2013[239]	3	Dose-response	per 10 g/d	197'228 / 10'507	0.79 (0.72 to 0.87)	NA	49.1%	NA	NA	-	6	Moderate
Wheat germ*	Aune 2013[239]	3	Dose-response	per 2 g/d	197'228 / 10'507	0.98 (0.87 to 1.11)	NA	50.1%	NA	NA	-	6	Low
Total rice	Saneei 2017[240]	7	High v low intake	700 g/d v <1/mo	352'953 / 13'637	1.18 (0.94 to 1.48)	0.15	77.7%	0.0669	0.57 to 2.44	0.02	7	Low
White rice*	Aune 2013[239]	7	Dose-response	per 1 s/d	352'879 / 13'637	1.23 (1.15 to 1.31)	NA	21.4%	NA	NA	-	6	Moderate
Brown rice*	Aune 2013[239]	3	Dose-response	Per 0.5 s/d	197'228 / 10'507	0.87 (0.78 to 0.97)	NA	26.1%	NA	NA	-	6	Low
Soy products	Tian 2017[241]	8	High v low intake	NA	457'927 / 78'381	0.83 (0.68 to 1.01)	0.05	89.4%	0.0607	0.43 to 1.58	0.005	6	Very low
Legumes	Schwingshackl 2017[226]	12	Dose-response	per 50 g/d	595'641 / 31'297	1.00 (0.92 to 1.09)	0.99	86.9%	0.0141	0.75 to 1.33	0.89	9	Low
Nuts	Schwingshackl 2017[226]	7	Dose-response	per 28 g/d	297'012 / 15'470	0.89 (0.71 to 1.12)	0.31	77.2%	0.0592	0.44 to 1.78	0.14	8	Low
Fruits and vegetables	Li 2014[242]	5	Dose-response	per 1 s/d	160'833 / 19'123	0.96 (0.88 to 1.05)	0.41	32.1%	0.0032	0.77 to 1.21	0.72	8	Low
Fruit total	Schwingshackl 2017[226]	13	Dose-response	per 100 g/d	850'985 / 53'317	0.98 (0.97 to 1.00)	0.009	24.8%	0.0001	0.95 to 1.01	0.33	9	Moderate
Berry fruits*	Guo 2016[243]	4	Dose-response	per 17 g/d	189'715 / 12'630	0.95 (0.91 to 0.99)	NA	0.0%	NA	NA	-	8	Low
Citrus fruits	Jia 2016[244]	6	High v low intake	1.57 s/d v <1 s/mo	304'391 / 1'614	1.02 (0.96 to 1.08)	0.58	0.0%	0.0000	0.93 to 1.11	0.65	9	Very low
Apples and pears	Guo 2017[245]	5	Dose-response	per 1 s/wk	228'315 / 14'120	0.97 (0.96 to 0.98)	0.000	0.0%	0.0000	0.96 to 0.99	0.92	8	Low
Vegetables total	Schwingshackl 2017[226]	11	Dose-response	per 100 g/d	734'949 / 45'648	0.98 (0.96 to 1.00)	0.13	64.3%	0.0006	0.93 to 1.04	0.91	9	Moderate
Cruciferous vegetables	Chen 2018[246]	4	Dose-response	Per 40 g/d	196'057 / 9325	0.93 (0.84 to 1.02)	0.16	81.2%	0.0076	0.61 to 1.44	0.20	8	Low
Green leafy vegetables	Chen 2018[246]	9	Dose-response	Per 40 g/d	697'337 / 50'499	0.97 (0.94 to 1.00)	0.04	74.1%	0.0010	0.89 to 1.05	0.35	8	Low
Yellow vegetables	Wang 2016[247]	3	High v low intake	NA	106'513 / 3'605	0.62 (0.52 to 0.73)	0.000	52.0%	0.0114	0.11 to 3.53	0.12	6	Low
Beverages													
Tea*	Yang WS 2014[248]	13	Dose-response	per 2 cups/d	503'165 / 35'574	0.95 (0.92 to 0.99)	NA	60.3%	NA	NA	-	9	Moderate

*summary hazard ratio extracted from published meta-analysis, no re-analysis possible, SHR = Summary hazard ratio, NA = not available

Supplemental Table 3 continued…

Exposure	Reference	No. of primary studies	Comparison	Range / Amount	No. of participants / No. of cases	SHR (95%-CI)	p-value	I^2	T^2	95%-PI	Egger's p-value	AMSTAR	NutriGrade
Total coffee	Carlström 2018[249]	30	Dose-response	per 1 cup/d	1'180'634 / 53'018	0.94 (0.93 to 0.95)	0.000	62.5%	0.0004	0.90 to 0.98	0.02	8	Moderate
Caffeinated coffee*	Ding 2014[250]	11	Dose-response	per 1 cup/d	492'203 / 29'073	0.91 (0.89 to 0.94)	NA	NA	NA	NA	-	8	Moderate
Decaffeinated coffee*	Ding 2014[250]	11	Dose-response	per 1 cup/d	492'203 / 29'385	0.94 (0.91 to 0.98)	NA	NA	NA	NA	-	8	Moderate
Sugar sweetened beverages	Imamura 2015[251]	14	Dose-response	per 1 s/d	384'063 / 36'348	1.26 (1.11 to 1.43)	0.000	73.8%	0.0339	0.83 to 1.93	0.33	10	High
Artificially sweetened beverages	Imamura 2015[251]	8	Dose-response	per 1 s/d	244'228 / 28'394	1.24 (1.10 to 1.39)	0.000	4.8%	0.0014	1.05 to 1.47	0.29	10	Moderate
Total fruit Juice	Imamura 2015[251]	9	Dose-response	per 1 s/d	361'234 / 32'114	1.10 (1.01 to 1.20)	0.03	41.0%	0.0063	0.89 to 1.37	0.93	10	Low
Sugar-sweetened fruit juice	Xi 2014[252]	2	High v low intake	>1 s/d v 0	191'686 / 12'375	1.28 (1.04 to 1.58)	0.02	43.3%	0.0140	NE (< 3 studies)	NA	7	Low
100% fruit juice	Xi 2014[252]	3	High v low intake	>2 s/d v 0	137'663 / 4'906	1.04 (0.89 to 1.22)	0.60	33.4%	0.0066	0.24 to 4.48	0.47	7	Very low
Fruit juice. not specifed	Xi 2014[252]	2	High v low intake	Q4 or ≥3 s/d v Q1 or 2 s/d	45'912 / 2'705	1.13 (0.91 to 1.41)	0.26	36.0%	0.0091	NE (< 3 studies)	NA	7	Very low
Alcoholic beverages													
Total alcohol	Li et al (2016)[33]	16	Non-linear dose-response	0-12 g/d	421'698 / 10'622	0.82 (0.71 to 0.94)	0.004	85.2%	0.0512	0.49 to 1.36	0.45	8	Moderate
		23		12-24 g/d	664'873 / 30'122	0.75 (0.67 to 0.83)	0.000	75.7%	0.0356	0.50 to 1.12	0.64	8	High
		16		≥24 g/d	306'745 / 8419	0.95 (0.83 to 1.09)	0.476	66.2%	0.0462	0.58 to 1.54	0.60	8	Moderate
Wine	Huang et al (2017)[253]	9	Non-linear dose-response	< 10 g/d	324'362 / 17'854	0.86 (0.81 to 0.91)	0.000	0.0%	0.0000	0.80 to 0.92	0.25	9	Low
		7		10-20 g/d	314'496 / 17'408	0.83 (0.76 to 0.91)	0.000	0.0%	0.0000	0.74 to 0.94	0.18	9	Low
		7		> 20 g/d	209'544 / 16'757	0.83 (0.76 to 0.91)	0.000	0.0%	0.0000	0.74 to 0.94	0.10	9	Low
Beer	Huang et al (2017)[253]	9	Non-linear dose-response	< 10 g/d	324'362 / 17'854	0.93 (0.86 to 1.00)	0.049	0.0%	0.0000	0.85 to 1.02	0.09	9	Low
		6		10-20 g/d	298'139 / 16'648	0.90 (0.83 to 0.98)	0.019	0.0%	0.0000	0.80 to 1.02	0.44	9	Moderate
		6		> 20 g/d	251'440 / 15'628	1.01 (0.88 to 1.16)	0.895	0.0%	0.0000	0.83 to 1.23	0.92	9	Low

*summary hazard ratio extracted from published meta-analysis, no re-analysis possible, SHR = Summary hazard ratio, NA = not available

Supplemental Table 3 continued…

Exposure	Reference	No. of primary studies	Comparison	Range / Amount	No. of participants / No. of cases	SHR (95%-CI)	p-value	I^2	T^2	95%-PI	Egger's p-value	AMSTAR	NutriGrade
Spirits	Huang et al (2017)[253]	8	Non-linear dose-response	< 10 g/d	292'940 / 17'492	0.92 (0.85 to 1.00)	0.04	11.9%	0.0015	0.80 to 1.06	0.08	9	Low
		6		10-20 g/d	283'047 / 17'046	0.94 (0.82 to 1.08)	0.40	22.0%	0.0066	0.70 to 1.27	0.38	9	Low
		5		> 20 g/d	220'018 / 15'266	1.23 (0.82 to 1.86)	0.31	64.1%	0.1183	0.34 to 4.44	0.64	9	Low
Macronutrients													
Total protein	Zhao et al (2018)[254]	9	Dose-response	per 5% of energy/d	403'109 / 32'663	1.09 (1.04 to 1.13)	0.000	34.7%	0.0011	0.99 to 1.19	0.70	10	Moderate
Animal protein	Zhao et al (2018)[254]	8	Dose-response	per 5% of energy/d	357'893 / 30'591	1.12 (1.08 to 1.17)	0.000	22.4%	0.0007	1.03 to 1.22	0.22	10	Moderate
Animal protein-to-potassium ratio*	Jayedi 2018[255]	3	Dose-response	NA	187'486 / 15'305	1.11 (1.07 to 1.15)	-	41.3%	NA	NA	-	9	Moderate
Plant protein	Zhao et al (2018)[254]	8	Dose-response	per 5% of energy/d	357'893 / 30'591	0.87 (0.74 to 1.01)	0.07	41.9%	0.0189	0.59 to 1.28	0.74	10	Low
Total fat	Alhazmi 2012[256]	4	High v low intake	Q5 v Q1	247'755 / 10'388	0.93 (0.86 to 1.01)	0.09	0.0%	0.0000	0.79 to 1.11	0.89	10	Low
Animal fat	Alhazmi 2012[256]	6	High v low intake	Q5 v Q1	392'093 / 12'242	1.03 (0.95 to 1.11)	0.40	0.0%	0.0000	0.92 to 1.16	0.59	10	Low
Vegetable fat	Alhazmi 2012[256]	6	High v low intake	Q5 v Q1	392'093 / 12'242	0.76 (0.68 to 0.85)	0.000	53.1%	0.0102	0.55 to 1.05	0.43	10	Moderate
MUFAs	Alhazmi 2012[256]	6	High v low intake	Q5 v Q1/1g/1% energy	309'758 / 8245	0.99 (0.90 to 1.09)	0.90	0.0%	0.0000	0.87 to 1.14	0.08	10	Low
Total omega-3 fatty acids*	Zhou 2012[257]	6	Dose-response	per 0.1 g/d	31'017 / 15'560	1.03 (1.00 to 1.06)	NA	92.1%	NA	NA	-	8	Low
EPA & DHA	Wu 2012[258]	15	Dose-response	per 250 mg/d	523'938 / 23'739	1.04 (0.97 to 1.11)	0.24	82.2%	0.0112	0.82 to 1.32	0.85	8	Low
EPA*	Wu 2012[258]	5	Dose-response	per 125 mg/d	47'644 / 4'051	1.07 (0.85 to 1.34)	NA	77.4%	NA	NA	-	8	Low
DHA*	Wu 2012[258]	5	Dose-response	per 125 mg/d	47'644 / 4'051	1.04 (0.90 to 1.21)	NA	80.2%	NA	NA	-	8	Low
ALA	Alhazmi 2012[256]	6	High v low intake	Q5 v Q1	323'024 / 16'200	0.92 (0.78 to 1.08)	0.31	66.2%	0.0245	0.56 to 1.50	0.73	10	Low
Total omega-6 fatty acids	Alhazmi 2012[256]	3	High v low intake	Q5 v Q1	83'209 / 4'483	0.93 (0.84 to 1.03)	0.18	0.0%	0.0000	0.48 to 1.81	0.70	10	Very low
PUFAs	Alhazmi 2012[256]	5	High v low intake	Q5 v Q1/1g/1% energy	272'449 / 6687	0.90 (0.80 to 1.02)	0.08	46.8%	0.0089	0.62 to 1.28	0.17	10	Low
Saturated fatty acids	De Souza 2015[259]	7	High v low intake	NA	236'306 / 8'900	0.95 (0.88 to 1.03)	0.21	0.0%	0.0000	0.86 to 1.05	0.74	8	Very low

*summary hazard ratio extracted from published meta-analysis, no re-analysis possible, SHR = Summary hazard ratio, NA = not available

Supplemental Table 3 continued…

Exposure	Reference	No. of primary studies	Comparison	Range / Amount	No. of participants / No. of cases	SHR (95%-CI)	p-value	I^2	T^2	95%-PI	Egger's p-value	AMSTAR	NutriGrade
Trans-fatty acids	De Souza 2015[259]	6	High v low intake	NA	230'155 / 8'781	1.10 (0.96 to 1.27)	0.22	66.0%	0.0206	0.70 to 1.71	0.81	8	Very low
Ruminant trans-fatty acids	De Souza 2015[259]	3	High v low intake	NA	8936 / 796	0.54 (0.36 to 0.79)	0.002	30.8%	0.0670	0.01 to 33.70	0.38	8	Low
Cholesterol	Tajima 2014[260]	4	Dose-response	per 100 mg/d	161'399 / 6'268	1.10 (1.03 to 1.17)	0.005	60.4%	0.0026	0.85 to 1.43	0.59	7	Low
Total carbohydrates	Alhazmi 2012[256]	8	High v low intake	Q5 v Q1	488'969 / 11'536	1.11 (1.00 to 1.23)	0.06	48.9%	0.0105	0.83 to 1.47	0.07	10	Low
Total sugars	Tsilas 2017[261]	5	Dose-response	per 100 g/d	135'799 / 22'711	0.87 (0.61 to 1.24)	0.44	90.8%	0.1253	0.25 to 3-08	0.74	8	Very low
Fructose	Tsilas 2017[261]	4	Dose-response	per 50 g/d	69'492 / 2'915	1.09 (0.68 to 1.75)	0.71	81.0%	0.1687	0.14 to 8.44	0.87	8	Very low
Glucose	Alhazmi 2012[256]	4	High v low intake	Q5 v Q1	104'704 / 3'080	1.18 (0.99 to 1.40)	0.07	50.4%	0.0157	0.61 to 2.28	0.59	10	Very low
Lactose	Alhazmi 2012[256]	3	High v low Intake	Q5 v Q1	79'637 / 2'236	0.96 (0.84 to 1.10)	0.57	0.0%	0.0000	0.39 to 2.35	0.83	10	Very low
Maltose	Alhazmi 2012[256]	2	High v low intake	Q5 v Q1	40'292 / 1'318	0.88 (0.64 to 1.21)	0.43	44.6%	0.0275	NA	NA	10	Very low
Sucrose	Tsilas 2017[261]	5	Dose-response	per 50 g/d	107'972 / 3'833	0.91 (0.84 to 0.99)	0.03	0.0%	0.0000	0.79 to 1.04	0.25	8	Low
Total fibre	Interact Consortium 2015[262]	15	Dose-response	per 10 g/d	414'711 / 26'131	0.91 (0.87 to 0.96)	0.000	31.0%	0.0023	0.81 to 1.03	0.14	7	Moderate
Cereal fibre	Interact Consortium 2015[262]	12	Dose-response	per 10 g/d	452'367 / 27'677	0.75 (0.65 to 0.86)	0.000	75.4%	0.0402	0.47 to 1.20	0.07	7	High
Fruit fibre	Interact Consortium 2015[262]	11	Dose-response	per 10 g/d	408'416 / 25'715	0.95 (0.87 to 1.03)	0.21	30.4%	0.0052	0.78 to 1.15	0.74	7	Moderate
Vegetable fibre	Interact Consortium 2015[262]	10	Dose-response	per 10 g/d	396'165 / 24'266	0.93 (0.82 to 1.06)	0.27	44.6%	0.0160	0.67 to 1.29	0.80	7	Moderate
Soluble fibre	Interact Consortium 2015[262]	3	Dose-response	per 10 g/d	65'373 / 2'141	0.70 (0.47 to 1.04)	0.08	0.0%	0.0000	0.05 to 9.02	0.35	5	Low
Insoluble fibre	Interact Consortium 2015[262]	3	Dose-response	per 10 g/d	65'373 / 2'141	0.73 (0.62 to 0.86)	0.000	0.0%	0.0000	0.25 to 2.11	0.90	5	Low
Micronutrients													
Vitamin D	Zhao 2013[263]	4	High v low intake	>800 v <100 IU/d	187'552 / 9'456	0.92 (0.85 to 1.00)	0.06	0.0%	0.0000	0.77 to 1.11	0.03	7	Very low

*summary hazard ratio extracted from published meta-analysis, no re-analysis possible, SHR = Summary hazard ratio, NA = not available

Supplemental Table 3 continued…

Exposure	Reference	No. of primary studies	Comparison	Range / Amount	No. of participants / No. of cases	SHR (95%-CI)	p-value	I^2	T^2	95%-PI	Egger's p-value	AMSTAR	NutriGrade
Total iron	Bao 2012[264]	3	Dose-response	per 5 mg/d	158'038 / 8'078	1.01 (0.99 to 1.03)	0.18	0.0%	0.0000	0.90 to 1.14	0.68	6	Low
Haem iron	Bao 2012[264]	3	Dose-response	per 1 mg/d	158'038 / 8'078	1.16 (1.09 to 1.24)	0.000	38.7%	0.0012	0.64 to 2.10	0.66	6	Low
Magnesium	Fang Xuexian 2016[265]	17	Dose-response	per 100 mg/d	518'339 / 25'557	0.81 (0.77 to 0.86)	0.000	60.6%	0.0058	0.68 to 0.96	0.11	9	Moderate
Calcium	Dong & Qin 2012[266]	6	High v low Intake	2596 v 500 mg/d	264'218 / 11'225	0.85 (0.74 to 0.98)	0.02	57.3%	0.0161	0.57 to 1.28	0.82	6	Low
Total polyphenols	Rienks et al (2018)[267]	2	High v low intake	NA	9236 / 770	0.56 (0.34 to 0.93)	0.02	77.5%	0.1030	NE (< 3 studies)	NE (< 3 studies)	8	Low
Flavonoids*	Rienks et al (2018)[267]	7	Dose-response	per 372 mg/d	309'780 / 28'976	0.96 (0.92 to 1.00)	NA	33.2%	NA	NA	NA	8	Low
Anthocyanins*	Guo 2016[243]	3	Dose-response	per 7.5 mg/d	200'894 / 12'611	0.95 (0.93 to 0.98)	NA	0.0%	NA	NA	-	8	Low
Flavanols	Rienks et al (2018)[267]	2	High v low intake	NA	31'894 / 11'286	0.68 (0.45 to 1.02)	0.06	78.8%	0.0687	NE (< 3 studies)	NE (< 3 studies)	8	Low
Flavan-3-ols*	Rienks et al (2018)[267]	4	Dose-response	per 79 mg/d	226'068 / 23'441	0.97 (0.93 to 1.00)	NA	61.4%	NA	NA	NA	8	Low
Catechin	Rienks et al (2018)[267]	2	High v low intake	NA	29'518 / 11'144	0.86 (0.75 to 0.97)	0.02	0.0%	0.0000	NE (< 3 studies)	NE (< 3 studies)	8	Low
Proanthocyanids	Rienks et al (2018)[267]	2	High v low intake	NA	29'518 / 11'144	0.88 (0.75 to 1.02)	0.09	11.1%	0.0021	NE (< 3 studies)	NE (< 3 studies)	8	Low
Flavanones	Rienks et al (2018)[267]	7	High v low intake	NA	245'182 / 24'737	1.01 (0.93 to 1.10)	0.81	45.5%	0.0049	0.82 to 1.24	0.04	8	Low
Flavones*	Rienks et al (2018)[267]	5	Dose-response	per 4.6 mg/d	264'086 / 25'055	1.05 (0.95 to 1.16)	NA	48.3%	NA	NA	NA	8	Low
Luteolin*	Rienks et al (2018)[267]	2	Dose-response	per 0.1 mg/d	63'523 / 2274	1.02 (0.94 to 1.10)	NA	0.0%	NA	NA	NA	8	Very low
Flavonoles*	Rienks et al (2018)[267]	7	Dose-response	per 28 mg/d	299'469 / 26'241	0.91 (0.83 to 1.00)	NA	80.4%	NA	NA	NA	8	Low
Quercetin*	Rienks et al (2018)[267]	4	Dose-response	per 10 mg/d	99'486 / 13'630	1.00 (0.94 to 1.05)	NA	43.7%	NA	NA	NA	8	Low
Kaempferol*	Rienks et al (2018)[267]	4	Dose-response	per 4 mg/d	99'486 / 13'630	0.98 (0.94 to 1.01)	NA	0.0%	NA	NA	NA	8	Low
Myricetin	Rienks et al (2018)[267]	4	High v low intake	NA	99'486 / 13'630	0.90 (0.76 to 1.05)	0.18	58.6%	0.0154	0.47 to 1.70	0.99	8	Low
Isoflavones*	Rienks et al (2018)[267]	7	Dose-response	per 0.63 mg/d	293'861 / 24'013	1.00 (1.00 to 1.00)	NA	21.0%	NA	NA	NA	8	Low
Daidzein*	Rienks et al (2018)[267]	4	Dose-response	per 0.2 mg/d	223'248 / 10'295	1.00 (1.00 to 1.00)	NA	66.1%	NA	NA	NA	8	Low

*summary hazard ratio extracted from published meta-analysis, no re-analysis possible, SHR = Summary hazard ratio, NA = not available

Supplemental Table 3 continued…

Exposure	Reference	No. of primary studies	Comparison	Range / Amount	No. of participants / No. of cases	SHR (95%-CI)	p-value	I^2	T^2	95%-PI	Egger's p-value	AMSTAR	NutriGrade
Genistein*	Rienks et al (2018)[267]	4	Dose-response	per 0.25 mg/d	223'248 / 10'295	1.00 (1.00 to 1.00)	NA	18.5%	NA	NA	NA	8	Low
Dihydrochalcones*	Rienks et al (2018)[267]	2	Dose-response	per 2 mg/d	9236 / 770	1.01 (0.98 to 1.04)	NA	0.0%	NA	NA	NA	8	Very low
Phenolic acids*	Rienks et al (2018)[267]	2	Dose-response	per 600 mg/d	9236 / 770	0.76 (0.64 to 0.89)	NA	0.0%	NA	NA	NA	8	Low
Stilbenes*	Rienks et al (2018)[267]	2	Dose-response	per 2.7 mg/d	9236 / 770	0.14 (0.01 to 1.51)	NA	94.9%	NA	NA	NA	8	Low
Lignans*	Rienks et al (2018)[267]	2	Dose-response	per 3 mg/d	9236 / 770	1.27 (0.68 to 2.42)	NA	52.5%	NA	NA	NA	8	Low
Other polyphenols*	Rienks et al (2018)[267]	2	Dose-response	per 50 mg/d	9236 / 770	1.05 (0.89 to 1.25)	NA	0.0%	NA	NA	NA	8	Very low
Vitamin E	Hamer & Chida 2007[268]	3	High v low intake	10 v <0.5 mg/d	14'772 / 1'541	0.77 (0.63 to 0.95)	0.02	0.0%	0.0000	0.20 to 2.97	0.75	8	Very low
Vitamin C	Hamer & Chida 2007[268]	2	High v low intake	87.9 v <49.7 mg/d	13'877 / 1'393	0.66 (0.51 to 0.85)	0.002	0.0%	0.0000	NE (< 3 studies)	NA	8	Very low
Lycopene	Hamer & Chida 2007[268]	2	High v low intake	>7079 v <2307 µg/d	40'087 / 1'927	0.96 (0.74 to 1.25)	0.76	60.3%	0.0233	NE (< 3 studies)	NA	8	Very low
Caffeine*	Ding 2014[250]	7	Dose-response	Per 140 mg/d	260'090 / 11'842	0.92 (0.90 to 0.94)	NA	NA	NA	NA	-	6	Low

*summary hazard ratio extracted from published meta-analysis, no re-analysis possible, SHR = Summary hazard ratio, NA = not available

Supplementary Table 4: Detailed evaluation of the methodological quality with AMSTAR

Exposure	Reference	Comparison	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	All
DIETARY BEHAVIOURS/DIET QUALITY INDICES														
Healthy dietary pattern	Esposito 2014[218]	High v low	yes 1	yes 1	yes 1	CA 0	no 0	yes 1	yes 1	no 0	yes 1	yes 1	yes 1	**8**
Healty eating index (HEI)	Schwingshackl 2017[220]	High v low	yes 1	yes 1	yes 1	no 0	no 0	yes 1	yes 1	yes 1	yes 1	yes 1	yes 1	**9**
Alternative healthy eating index (AHEI)	Schwingshackl 2017[220]	High v low	yes 1	yes 1	yes 1	no 0	no 0	yes 1	yes 1	yes 1	yes 1	yes 1	yes 1	**9**
Dietary approach to stop hypertension (DASH)	Schwingshackl 2017[220]	High v low	yes 1	yes 1	yes 1	no 0	no 0	yes 1	yes 1	yes 1	yes 1	yes 1	yes 1	**9**
Mediterranean diet	Koloverou 2014[221]	High v low	yes 1	yes 1	yes 1	no 0	yes 1	yes 1	yes 1	no 0	yes 1	yes 1	yes 1	**9**
Vegetarian diet	Lee & Park 2017[222]	High v low	yes 1	yes 1	yes 1	no 0	no 0	yes 1	no 0	no 0	yes 1	yes 1	yes 1	**7**
Low carbohydrate diet	Namazi 2017[223]	High v low	yes 1	yes 1	yes 1	no 0	no 0	yes 1	yes 1	yes 1	yes 1	yes 1	no 0	**8**
Unhealthy dietary pattern	Alhazmi 2014[219]	High v low	yes 1	yes 1	yes 1	yes 1	no 0	yes 1	yes 1	no 0	yes 1	yes 1	yes 1	**9**
Breakfast skipping	Bi 2015[224]	High v low	yes 1	yes 1	yes 1	CA 0	no 0	yes 1	yes 1	no 0	yes 1	yes 1	yes 1	**8**
Glycemic index	Bhupathiraju 2014[225]	High v low	yes 1	yes 1	yes 1	CA 0	no 0	yes 1	yes 1	no 0	yes 1	yes 1	yes 1	**8**
Glycemic load	Bhupathiraju 2014[225]	High v low	yes 1	yes 1	yes 1	CA 0	no 0	yes 1	yes 1	no 0	yes 1	yes 1	yes 1	**8**
Dietary acid load	Jayedi 2018[255]	Dose-response	yes 1	yes 1	yes 1	no 0	no 0	yes 1	yes 1	yes 1	yes 1	yes 1	yes 1	**9**
FOOD GROUPS, FOODS & BEVERAGES														
Total dairy	Schwingshackl 2017[226]	Dose-response	yes 1	yes 1	yes 1	CA 0	no 0	yes 1	yes 1	yes 1	yes 1	yes 1	yes 1	**9**
Low-fat dairy products	Gijsbers 2016[227]	Dose-response	yes 1	yes 1	yes 1	CA 0	no 0	yes 1	yes 1	no 0	yes 1	yes 1	yes 1	**8**
High-fat dairy products	Gijsbers 2016[227]	Dose-response	yes 1	yes 1	yes 1	CA 0	no 0	yes 1	yes 1	no 0	yes 1	yes 1	yes 1	**8**
Milk	Gijsbers 2016[227]	Dose-response	yes 1	yes 1	yes 1	CA 0	no 0	yes 1	yes 1	no 0	yes 1	yes 1	yes 1	**8**
Low-fat milk	Gijsbers 2016[227]	Dose-response	yes 1	yes 1	yes 1	CA 0	no 0	yes 1	yes 1	no 0	yes 1	no 0	yes 1	**7**
High-fat milk	Gijsbers 2016[227]	Dose-response	yes 1	yes 1	yes 1	CA 0	no 0	yes 1	yes 1	no 0	yes 1	yes 1	yes 1	**8**
Yogurt	Gijsbers 2016[227]	Dose-response	yes 1	yes 1	yes 1	CA 0	no 0	yes 1	yes 1	no 0	yes 1	yes 1	yes 1	**8**
Cheese	Gijsbers 2016[227]	Dose-response	yes 1	yes 1	yes 1	CA 0	no 0	yes 1	yes 1	no 0	yes 1	yes 1	yes 1	**8**
Cottage cheese	Aune 2013[228]	High v low	yes 1	no 0	yes 1	no 0	yes 1	yes 1	no 0	no 0	yes 1	NA 0	yes 1	**6**
Fermented dairy products	Gao 2013[229]	High v low	yes 1	yes 1	yes 1	no 0	no 0	yes 1	yes 1	yes 1	yes 1	no 0	yes 1	**8**
Cream	Gijsbers 2016[227]	Dose-response	yes 1	yes 1	yes 1	CA 0	no 0	yes 1	yes 1	no 0	yes 1	no 0	yes 1	**7**
Ice cream	Gijsbers 2016[227]	Dose-response	yes 1	yes 1	yes 1	CA 0	no 0	yes 1	yes 1	no 0	yes 1	no 0	yes 1	**7**
Sherbet	Gijsbers 2016[227]	Dose-response	yes 1	yes 1	yes 1	CA 0	no 0	yes 1	yes 1	no 0	yes 1	no 0	yes 1	**7**
Chocolate	Yuan 2017[230]	Dose-response	yes 1	yes 1	yes 1	no 0	no 0	yes 1	yes 1	yes 1	yes 1	yes 1	no 0	**8**
Eggs	Schwingshackl 2017[226]	Dose-response	yes 1	yes 1	yes 1	CA 0	no 0	yes 1	yes 1	yes 1	yes 1	yes 1	yes 1	**9**
Total meat	Feskens 2013[231]	Dose-response	CA 0	CA 0	CA 0	CA 0	no 0	no 0	no 0	no 0	yes 1	yes 1	yes 1	**3**
Red meat	Schwingshackl 2017[226]	Dose-response	yes 1	yes 1	yes 1	CA 0	no 0	yes 1	yes 1	yes 1	yes 1	yes 1	yes 1	**9**

Q = Question; Q1: Was an ‚a priori' design provided?, Q2: Was there duplicate study selection and data extraction?, Q3: Was a comprehensive literature search performed?, Q4: Was the status of publication (i.e. grey literature) used as an inclusion criterion?, Q5: Was a list of studies (included and excluded) provided?, Q6: Were the characteristics of the included studies provided?, Q7: Was the scientific quality of the included studies assessed and documented?, Q8: Was the scientific quality of the included studies used appropriately in formulation conclusions?, Q9: Were the methods used to combine the findings of studies appropriate?, Q10: Was the likelihood of publication bias assessed?, Q11: Was the conflict of interest included?

Supplementary Table 4 continued…

Exposure	Reference	Comparison	Q1		Q2		Q3		Q4		Q5		Q6		Q7		Q8		Q9		Q10		Q11		All
Processed meat	Schwingshackl 2017[226]	Dose-response	yes	1	yes	1	yes	1	CA	0	no	0	yes	1	yes	1	yes	1	yes	1	yes	1	yes	1	**9**
Hamburger	Aune 2009[232]	High v low	yes	1	CA	0	yes	1	CA	0	no	0	yes	1	no	0	no	0	yes	1	CA	0	yes	1	**5**
Bacon	Micha 2010[233]	High v low	yes	1	yes	1	yes	1	yes	1	yes	1	yes	1	yes	1	no	0	yes	1	CA	0	yes	1	**9**
Hot Dogs	Micha 2010[233]	High v low	yes	1	yes	1	yes	1	yes	1	yes	1	yes	1	yes	1	no	0	yes	1	CA	0	yes	1	**9**
Poultry	Feskens 2013[231]	Dose-response	CA	0	CA	0	CA	0	CA	0	no	0	no	0	no	0	no	0	yes	1	no	0	yes	1	**2**
Processed red meat	Pan 2011[234]	Dose-response	yes	1	CA	0	yes	1	no	0	no	0	yes	1	no	0	no	0	yes	1	yes	1	yes	1	**6**
Unprocessed red meat	Feskens 2013[231]	Dose-response	CA	0	CA	0	CA	0	CA	0	no	0	no	0	no	0	no	0	yes	1	no	0	yes	1	**2**
Total fish/seafood	Schwingshackl 2017226	Dose-response	yes	1	yes	1	yes	1	CA	0	no	0	yes	1	yes	1	yes	1	yes	1	yes	1	yes	1	**9**
Lean fish	Zhang 2013[235]	High v low	yes	1	yes	1	yes	1	CA	0	no	0	yes	1	yes	1	yes	1	no	0	yes	1	yes	1	**8**
Oily fish	Zhang 2013[235]	High v low	yes	1	yes	1	yes	1	CA	0	no	0	yes	1	yes	1	yes	1	yes	1	yes	1	yes	1	**9**
Shellfish	Zhang 2013[235]	High v low	yes	1	yes	1	yes	1	CA	0	no	0	yes	1	yes	1	yes	1	yes	1	yes	1	yes	1	**9**
Fish	Zhang 2013[235]	High v low	yes	1	yes	1	yes	1	CA	0	no	0	yes	1	yes	1	yes	1	yes	1	yes	1	yes	1	**9**
Butter	Pimpin 2016[236]	Dose-response	yes	1	yes	1	yes	1	yes	1	yes	1	yes	1	yes	1	yes	1	yes	1	yes	1	yes	1	**11**
Olive oil	Schwingshackl 2017b[237]	Dose-response	yes	1	yes	1	yes	1	CA	0	no	0	yes	1	yes	1	yes	1	yes	1	NA	0	yes	1	**8**
Potatoes	Schwingshackl 2018[238]	Dose-response	yes	1	yes	1	yes	1	no	0	yes	1	yes	1	no	0	no	0	yes	1	no	0	yes	1	**7**
French fries	Schwingshackl 2018[238]	Dose-response	yes	1	yes	1	yes	1	no	0	yes	1	yes	1	no	0	no	0	yes	1	no	0	yes	1	**7**
Boiled/baked mashed potatoes	Schwingshackl 2018[238]	Dose-response	yes	1	yes	1	yes	1	no	0	yes	1	yes	1	no	0	no	0	yes	1	no	0	yes	1	**7**
Whole grain	Schwingshackl 2017[226]	Dose-response	yes	1	yes	1	yes	1	CA	0	no	0	yes	1	yes	1	yes	1	yes	1	yes	1	yes	1	**9**
Refined grain	Schwingshackl 2017[226]	Dose-response	yes	1	yes	1	yes	1	CA	0	no	0	yes	1	yes	1	yes	1	yes	1	yes	1	yes	1	**9**
Total grains	Aune 2013[239]	Dose-response	yes	1	no	0	yes	1	CA	0	no	0	yes	1	no	0	yes	1	yes	1	CA	0	yes	1	**6**
Whole grain bread	Aune 2013[239]	High v low	yes	1	no	0	yes	1	CA	0	no	0	yes	1	no	0	yes	1	yes	1	CA	0	yes	1	**6**
Whole grain cereals	Aune 2013[239]	High v low	yes	1	no	0	yes	1	CA	0	no	0	yes	1	no	0	yes	1	yes	1	CA	0	yes	1	**6**
Wheat bran	Aune 2013[239]	High v low	yes	1	no	0	yes	1	CA	0	no	0	yes	1	no	0	yes	1	yes	1	CA	0	yes	1	**6**
Wheat germ	Aune 2013[239]	High v low	yes	1	no	0	yes	1	CA	0	no	0	yes	1	no	0	yes	1	yes	1	CA	0	yes	1	**6**
Rice	Saneei 2017[240]	High v low	yes	1	yes	1	yes	1	no	0	no	0	yes	1	yes	1	no	0	yes	1	CA	0	yes	1	**7**
White rice	Aune 2013[239]	Dose-response	yes	1	no	0	yes	1	CA	0	no	0	yes	1	no	0	yes	1	yes	1	CA	0	yes	1	**6**
Brown rice	Aune 2013[239]	Dose-response	yes	1	no	0	yes	1	CA	0	no	0	yes	1	no	0	yes	1	yes	1	CA	0	yes	1	**6**
Soy products	Tian 2017[241]	High v low	yes	1	CA	0	yes	1	no	0	no	0	yes	1	no	0	no	0	yes	1	yes	1	yes	1	**6**
Legumes	Schwingshackl 2017[226]	Dose-response	yes	1	yes	1	yes	1	CA	0	no	0	yes	1	yes	1	yes	1	yes	1	yes	1	yes	1	**9**
Nuts	Schwingshackl 2017[226]	Dose-response	yes	1	yes	1	yes	1	CA	0	no	0	yes	1	yes	1	yes	1	yes	1	no	0	yes	1	**8**
Fruits and vegetables	Li 2014[242]	Dose-response	yes	1	yes	1	yes	1	CA	0	no	0	yes	1	yes	1	yes	1	yes	1	no	0	yes	1	**8**
Fruit total	Schwingshackl 2017[226]	Dose-response	yes	1	yes	1	yes	1	CA	0	no	0	yes	1	yes	1	yes	1	yes	1	yes	1	yes	1	**9**
Berry fruits	Guo 2016[243]	High v low	yes	1	yes	1	yes	1	CA	0	no	0	yes	1	yes	1	yes	1	yes	1	no	0	yes	1	**8**
Citrus fruits	Jia 2016[244]	High v low	yes	1	yes	1	yes	1	no	0	no	0	yes	1	yes	1	yes	1	yes	1	yes	1	yes	1	**9**
Apples and pears	Guo 2017[245]	Dose-response	yes	1	yes	1	yes	1	CA	0	no	0	yes	1	yes	1	yes	1	yes	1	no	0	yes	1	**8**
Vegetables total	Schwingshackl 2017[226]	Dose-response	yes	1	yes	1	yes	1	CA	0	no	0	yes	1	yes	1	yes	1	yes	1	yes	1	yes	1	**9**

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Supplementary Table 4 continued…

Exposure	Reference	Comparison	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	All
Green leafy vegetables	Chen 2018[246]	Dose-response	yes 1	CA 0	no 0	no 0	yes 1	yes 1	yes 1	yes 1	yes 1	yes 1	yes 1	**8**
Cruciferous vegetables	Chen 2018[246]	Dose-response	yes 1	CA 0	no 0	no 0	yes 1	yes 1	yes 1	yes 1	yes 1	yes 1	yes 1	**8**
Yellow vegetables	Wang 2016[247]	High v low	CA 0	yes 1	yes 1	CA 0	no 0	yes 1	yes 1	yes 1	CA 0	CA 0	yes 1	**6**
Tea	Yang WS 2014[192]	High v low	yes 1	yes 1	yes 1	CA 0	no 0	yes 1	yes 1	yes 1	yes 1	yes 1	yes 1	**9**
Total coffee	Carlström 2018[249]	High v low	yes 1	yes 1	no 0	no 0	no 0	yes 1	yes 1	yes 1	yes 1	yes 1	yes 1	**8**
Caffeinated coffee	Ding 2014[250]	Dose-response	yes 1	no 0	yes 1	CA 0	no 0	yes 1	yes 1	yes 1	yes 1	yes 1	yes 1	**8**
Decaffeinated coffee	Ding 2014[250]	Dose-response	yes 1	no 0	yes 1	CA 0	no 0	yes 1	yes 1	yes 1	yes 1	yes 1	yes 1	**8**
Sugar sweetened beverages	Imamura 2015[251]	Dose-response	yes 1	yes 1	yes 1	CA 0	yes 1	yes 1	yes 1	yes 1	yes 1	yes 1	yes 1	**10**
Artificially sweetened beverages	Imamura 2015[251]	Dose-response	yes 1	yes 1	yes 1	CA 0	yes 1	yes 1	yes 1	yes 1	yes 1	yes 1	yes 1	**10**
Total fruit Juice	Imamura 2015[251]	Dose-response	yes 1	yes 1	yes 1	CA 0	yes 1	yes 1	yes 1	yes 1	yes 1	yes 1	yes 1	**10**
Sugar-sweetened fruit juice	Xi 2014[252]	High v low	yes 1	yes 1	yes 1	CA 0	no 0	yes 1	yes 1	no 0	yes 1	no 0	yes 1	**7**
100% fruit juice	Xi 2014[252]	High v low	yes 1	yes 1	yes 1	CA 0	no 0	yes 1	yes 1	no 0	yes 1	no 0	yes 1	**7**
Fruit juice, not specifed	Xi 2014[252]	High v low	yes 1	yes 1	yes 1	CA 0	no 0	yes 1	yes 1	no 0	yes 1	no 0	yes 1	**7**
Total alcohol	Li 2016[33]	Non-linear dose-response	yes 1	yes 1	yes 1	no 0	no 0	yes 1	yes 1	no 0	yes 1	yes 1	yes 1	**8**
Wine	Huang 2017[253]	Non-linear dose-response	yes 1	yes 1	yes 1	no 0	no 0	yes 1	yes 1	yes 1	yes 1	yes 1	yes 1	**9**
Beer	Huang 2017[253]	Non-linear dose-response	yes 1	yes 1	yes 1	no 0	no 0	yes 1	yes 1	yes 1	yes 1	yes 1	yes 1	**9**
Spirits	Huang 2017[253]	Non-linear dose-response	yes 1	yes 1	yes 1	no 0	no 0	yes 1	yes 1	yes 1	yes 1	yes 1	yes 1	**9**
MACRONUTRIENTS														
Total protein	Zhao 2018[254]	Dose-response	yes 1	yes 1	yes 1	no 0	yes 1	yes 1	yes 1	yes 1	yes 1	yes 1	yes 1	**10**
Animal protein	Zhao 2018[254]	Dose-response	yes 1	yes 1	yes 1	no 0	yes 1	yes 1	yes 1	yes 1	yes 1	yes 1	yes 1	**10**
Animal protein-to-potassium ratio	Jayedi 2018[255]	Dose-response	yes 1	yes 1	yes 1	no 0	no 0	yes 1	yes 1	yes 1	yes 1	yes 1	yes 1	**9**
Plant protein	Zhao 2018[254]	Dose-response	yes 1	yes 1	yes 1	no 0	yes 1	yes 1	yes 1	yes 1	yes 1	yes 1	yes 1	**10**
Total fat	Alhazmi 2012[256]	High v low	yes 1	yes 1	yes 1	yes 1	no 0	yes 1	yes 1	yes 1	yes 1	yes 1	yes 1	**10**
Animal fat	Alhazmi 2012[256]	High v low	yes 1	yes 1	yes 1	yes 1	no 0	yes 1	yes 1	yes 1	yes 1	yes 1	yes 1	**10**
Vegetable fat	Alhazmi 2012[256]	High v low	yes 1	yes 1	yes 1	yes 1	no 0	yes 1	yes 1	yes 1	yes 1	yes 1	yes 1	**10**
MUFAs	Alhazmi 2012[256]	High v low	yes 1	yes 1	yes 1	yes 1	no 0	yes 1	yes 1	yes 1	yes 1	yes 1	yes 1	**10**

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Supplementary Table 4 continued…

Exposure	Reference	Comparison	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	All
Total omega-3 fatty acids	Zhou 2012[257]	High v low	yes 1	yes 1	yes 1	CA 0	no 0	yes 1	yes 1	no 0	yes 1	yes 1	yes 1	**8**
EPA & DHA	Wu 2012[258]	Dose-response	yes 1	yes 1	yes 1	CA 0	no 0	yes 1	yes 1	yes 1	yes 1	CA 0	yes 1	**8**
EPA	Wu 2012[258]	Dose-response	yes 1	yes 1	yes 1	CA 0	no 0	yes 1	yes 1	yes 1	yes 1	CA 0	yes 1	**8**
DHA	Wu 2012[258]	Dose-response	yes 1	yes 1	yes 1	CA 0	no 0	yes 1	yes 1	yes 1	yes 1	CA 0	yes 1	**8**
ALA	Alhazmi 2012[256]	High v low	yes 1	yes 1	yes 1	yes 1	no 0	yes 1	yes 1	yes 1	yes 1	yes 1	yes 1	**10**
Total omega-6 fatty acids	Alhazmi 2012[256]	High v low	yes 1	yes 1	yes 1	yes 1	no 0	yes 1	yes 1	yes 1	yes 1	yes 1	yes 1	**10**
PUFAs	Alhazmi 2012[256]	High v low	yes 1	yes 1	yes 1	yes 1	no 0	yes 1	yes 1	yes 1	yes 1	yes 1	yes 1	**10**
Saturated fatty acids	De Souza 2015[259]	High v low	yes 1	yes 1	yes 1	CA 0	no 0	yes 1	yes 1	yes 1	yes 1	no 0	yes 1	**8**
Trans-fatty acids	De Souza 2015[259]	High v low	yes 1	yes 1	yes 1	CA 0	no 0	yes 1	yes 1	yes 1	yes 1	NA 0	yes 1	**8**
Ruminant trans-fatty acids	De Souza 2015[259]	High v low	yes 1	yes 1	yes 1	CA 0	no 0	yes 1	yes 1	yes 1	yes 1	no 0	yes 1	**8**
Cholesterol	Tajima 2014[260]	Dose-response	yes 1	yes 1	yes 1	CA 0	no 0	yes 1	yes 1	no 0	no 0	yes 1	yes 1	**7**
Total carbohydrates	Alhazmi 2012[256]	High v low	yes 1	yes 1	yes 1	yes 1	no 0	yes 1	yes 1	yes 1	yes 1	yes 1	yes 1	**10**
Total sugars	Tsilas 2017[261]	Dose-response	yes 1	yes 1	yes 1	CA 0	no 0	yes 1	yes 1	yes 1	yes 1	NA 0	yes 1	**8**
Fructose	Tsilas 2017[261]	Dose-response	yes 1	yes 1	yes 1	CA 0	no 0	yes 1	yes 1	yes 1	yes 1	NA 0	yes 1	**8**
Glucose	Alhazmi 2012[256]	High v low	yes 1	yes 1	yes 1	yes 1	no 0	yes 1	yes 1	yes 1	yes 1	yes 1	yes 1	**10**
Lactose	Alhazmi 2012[256]	High v low	yes 1	yes 1	yes 1	yes 1	no 0	yes 1	yes 1	yes 1	yes 1	yes 1	yes 1	**10**
Maltose	Alhazmi 2012[256]	High v low	yes 1	yes 1	yes 1	yes 1	no 0	yes 1	yes 1	yes 1	yes 1	yes 1	yes 1	**10**
Sucrose	Tsilas 2017[261]	Dose-response	yes 1	yes 1	yes 1	CA 0	no 0	yes 1	yes 1	yes 1	yes 1	NA 0	yes 1	**8**
Total fibre	Interact Consortium 2015[262]	Dose-response	yes 1	yes 1	yes 1	CA 0	no 0	yes 1	no 0	no 0	yes 1	yes 1	yes 1	**7**
Cereal fibre	Interact Consortium 2015[262]	Dose-response	yes 1	yes 1	yes 1	CA 0	no 0	yes 1	no 0	no 0	yes 1	yes 1	yes 1	**7**
Fruit fibre	Interact Consortium 2015[262]	Dose-response	yes 1	yes 1	yes 1	CA 0	no 0	yes 1	no 0	no 0	yes 1	yes 1	yes 1	**7**
Vegetable fibre	Interact Consortium 2015[262]	Dose-response	yes 1	yes 1	yes 1	CA 0	no 0	yes 1	no 0	no 0	yes 1	yes 1	yes 1	**7**
Soluble fibre	Interact Consortium 2015[262]	Dose-response	CA 0	yes 1	yes 1	CA 0	no 0	yes 1	no 0	no 0	yes 1	no 0	yes 1	**5**
Insoluble fibre	Interact Consortium 2015[262]	Dose-response	CA 0	yes 1	yes 1	CA 0	no 0	yes 1	no 0	no 0	yes 1	no 0	yes 1	**5**
MICRONUTRIENTS														
Vitamin D	Zhao 2013[263]	High v low	yes 1	yes 1	yes 1	yes 1	no 0	yes 1	no 0	no 0	yes 1	yes 1	no 0	**7**
Total iron	Bao 2012[264]	Dose-response	yes 1	yes 1	yes 1	CA 0	no 0	yes 1	no 0	no 0	yes 1	CA 0	yes 1	**6**
Haem iron	Bao 2012[264]	Dose-response	yes 1	yes 1	yes 1	CA 0	no 0	yes 1	no 0	no 0	yes 1	CA 0	yes 1	**6**
Magnesium	Fang Xuexian 2016[265]	Dose-response	yes 1	yes 1	yes 1	yes 1	no 0	yes 1	yes 1	no 0	yes 1	yes 1	yes 1	**9**
Calcium	Dong & Qin 2012[266]	High v low	yes 1	CA 0	yes 1	CA 0	no 0	yes 1	no 0	no 0	yes 1	yes 1	yes 1	**6**

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Supplementary Table 4 continued…

Exposure	Reference	Comparison	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	All
Total polyphenols	Rienks et al (2018)[267]	High v low	yes 1	yes 1	yes 1	no 0	no 0	yes 1	yes 1	no 0	yes 1	yes 1	yes 1	**8**
Flavoinoids	Rienks et al (2018)[267]	Dose-response	yes 1	yes 1	yes 1	no 0	no 0	yes 1	yes 1	no 0	yes 1	yes 1	yes 1	**8**
Anthocyanins	Guo 2016[243]	Dose-response	yes 1	yes 1	yes 1	CA 0	no 0	yes 1	yes 1	yes 1	yes 1	no 0	yes 1	**8**
Flavanols	Rienks et al (2018)[267]	High v low	yes 1	yes 1	yes 1	no 0	no 0	yes 1	yes 1	no 0	yes 1	yes 1	yes 1	**8**
Flavan-3-ols	Rienks et al (2018)[267]	Dose-response	yes 1	yes 1	yes 1	no 0	no 0	yes 1	yes 1	no 0	yes 1	yes 1	yes 1	**8**
Catechin	Rienks et al (2018)[267]	High v low	yes 1	yes 1	yes 1	no 0	no 0	yes 1	yes 1	no 0	yes 1	yes 1	yes 1	**8**
Proanthocyanids	Rienks et al (2018)[267]	High v low	yes 1	yes 1	yes 1	no 0	no 0	yes 1	yes 1	no 0	yes 1	yes 1	yes 1	**8**
Flavanones	Rienks et al (2018)[267]	High v low	yes 1	yes 1	yes 1	no 0	no 0	yes 1	yes 1	no 0	yes 1	yes 1	yes 1	**8**
Flavones	Rienks et al (2018)[267]	Dose-response	yes 1	yes 1	yes 1	no 0	no 0	yes 1	yes 1	no 0	yes 1	yes 1	yes 1	**8**
Luteolin	Rienks et al (2018)[267]	Dose-response	yes 1	yes 1	yes 1	no 0	no 0	yes 1	yes 1	no 0	yes 1	yes 1	yes 1	**8**
Flavonoles	Rienks et al (2018)[267]	Dose-response	yes 1	yes 1	yes 1	no 0	no 0	yes 1	yes 1	no 0	yes 1	yes 1	yes 1	**8**
Quercetin	Rienks et al (2018)[267]	Dose-response	yes 1	yes 1	yes 1	no 0	no 0	yes 1	yes 1	no 0	yes 1	yes 1	yes 1	**8**
Kaempferol	Rienks et al (2018)[267]	Dose-response	yes 1	yes 1	yes 1	no 0	no 0	yes 1	yes 1	no 0	yes 1	yes 1	yes 1	**8**
Myricetin	Rienks et al (2018)[267]	High v low	yes 1	yes 1	yes 1	no 0	no 0	yes 1	yes 1	no 0	yes 1	yes 1	yes 1	**8**
Isoflavones	Rienks et al (2018)[267]	Dose-response	yes 1	yes 1	yes 1	no 0	no 0	yes 1	yes 1	no 0	yes 1	yes 1	yes 1	**8**
Daidzein	Rienks et al (2018)[267]	Dose-response	yes 1	yes 1	yes 1	no 0	no 0	yes 1	yes 1	no 0	yes 1	yes 1	yes 1	**8**
Genistein	Rienks et al (2018)[267]	Dose-response	yes 1	yes 1	yes 1	no 0	no 0	yes 1	yes 1	no 0	yes 1	yes 1	yes 1	**8**
Dihydrochalcones	Rienks et al (2018)[267]	Dose-response	yes 1	yes 1	yes 1	no 0	no 0	yes 1	yes 1	no 0	yes 1	yes 1	yes 1	**8**
Phenolic acids	Rienks et al (2018)[267]	Dose-response	yes 1	yes 1	yes 1	no 0	no 0	yes 1	yes 1	no 0	yes 1	yes 1	yes 1	**8**
Stilbenes	Rienks et al (2018)[267]	Dose-response	yes 1	yes 1	yes 1	no 0	no 0	yes 1	yes 1	no 0	yes 1	yes 1	yes 1	**8**
Lignans	Rienks et al (2018)[267]	Dose-response	yes 1	yes 1	yes 1	no 0	no 0	yes 1	yes 1	no 0	yes 1	yes 1	yes 1	**8**
Others	Rienks et al (2018)[267]	Dose-response	yes 1	yes 1	yes 1	no 0	no 0	yes 1	yes 1	no 0	yes 1	yes 1	yes 1	**8**
Vitamin E	Hamer & Chida 2007[268]	High v low	yes 1	CA 0	yes 1	CA 0	yes 1	yes 1	yes 1	yes 1	yes 1	CA 0	yes 1	**8**
Vitamin C	Hamer & Chida 2007[268]	High v low	yes 1	CA 0	yes 1	CA 0	yes 1	yes 1	yes 1	yes 1	yes 1	CA 0	yes 1	**8**
Lycopene	Hamer & Chida 2007[268]	High v low	yes 1	CA 0	yes 1	CA 0	yes 1	yes 1	yes 1	yes 1	yes 1	CA 0	yes 1	**8**
Caffeine	Ding 2014[250]	Dose-response	no 0	no 0	yes 1	CA 0	no 0	yes 1	yes 1	yes 1	yes 1	CA 0	yes 1	**6**

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Supplementary Table 5: Scoring for the different components of NutriGrade* for each exposure

Exposure	Reference	Comparison	Risk of bias	Precision	Heterogeneity	Directness	Publication bias	Funding bias	Effect size	Dose-response	Sum	NutriGrade
DIETARY BEHAVIOURS/DIET QUALITY INDICES												
Healthy dietary pattern	Esposito 2014[218]	High v low	2	1	0,8	1	1	0,5	1	0	7,3	Moderate
Healty eating index (HEI)	Schwingshackl 2017[220]	High v low	2	1	0	1	0	1	0	0	5	Low
Alternative healthy eating index (AHEI)	Schwingshackl 2017[220]	High v low	1,5	1	0,5	1	0,5	1	1	0	6,5	Moderate
Dietary approach to stop hypertension (DASH)	Schwingshackl 2017[220]	High v low	1,5	1	0,5	1	0,5	1	0	0	5,5	Low
Mediterranean diet	Koloverou 2014[221]	High v low	2	1	0,4	1	0,5	1	0	0	5,9	Low
Vegetarian diet	Lee & Park 2017[222]	Vegetarian v omnivores	1	0	0	1	0	1	1	0	4	Low
Low carbohydrate diet	Namazi 2017[223]	High v low	1,5	0	0	1	0	1	0	0	3,5	Very low
Unhealthy dietary pattern	Alhazmi 2014[219]	High v low	1,5	1	0,8	1	1	1	1	0	7,3	Moderate
Breakfast skipping	Bi 2015[224]	Everyday v never	2	0	0	1	0	1	1	0	5	Low
Glycemic index	Bhupathiraju 2014[225]	High v low	1,5	1	0,8	1	0	1	0	0	5,3	Low
Glycemic load	Bhupathiraju 2014[225]	High v low	1,5	1	0,8	1	1	1	0	0	6,3	Moderate
Dietary acid load	Jayedi 2018[255]	Dose-response	2	1	0,4	1	0,5	1	0	1	6,9	Moderate
FOOD GROUPS, FOODS & BEVERAGES												
Total dairy	Schwingshackl 2017[226]	Dose-response	1,5	1	1	1	0,5	1	0	1	7	Moderate
Low-fat dairy products	Gijsbers 2016[227]	Dose-response	1,5	1	0,8	1	1	0,5	0	0	5,8	Low
High-fat dairy products	Gijsbers 2016[227]	Dose-response	1,5	1	0,8	1	1	0,5	0	0	5,8	Low
Milk	Gijsbers 2016[227]	Dose-response	1	1	0,8	1	1	0,5	0	0	5,3	Low
Low-fat milk	Gijsbers 2016[227]	Dose-response	1,5	1	0,4	1	0	0,5	0	0	4,4	Low
High-fat milk	Gijsbers 2016[227]	Dose-response	1,5	1	0,4	1	0	0,5	0	0	4,4	Low
Yogurt	Gijsbers 2016[227]	Dose-response	1	1	0,8	1	1	0,5	0	1	6,3	Moderate
Cheese	Gijsbers 2016[227]	Dose-response	1,5	1	0,4	1	0,5	0,5	0	0	4,9	Low
Cottage cheese	Aune 2013[228]	High v low	1,5	0	0	1	0	1	0	0	3,5	Very low
Fermented dairy products	Gao 2013[229]	High v low	1,5	1	0	1	0	1	0	0	4,5	Low
Cream	Gijsbers 2016[227]	Dose-response	1,5	1	0,8	1	1	0,5	0	0	5,8	Low
Ice cream	Gijsbers 2016[227]	Dose-response	2	1	0	1	0	0,5	0	1	5,5	Low
Sherbet	Gijsbers 2016[227]	Dose-response	2	1	0	1	0	0,5	0	0	4,5	Low
Chocolate	Yuan 2017[230]	Dose-response	2	1	0	1	0	1	0	0	5	Moderate
Eggs	Schwingshackl 2017[226]	Dose-response	1,5	0	1	0,5	1	1	0	0	5	Low
Total meat	Feskens 2013[231]	Dose-response	2	1	0,4	1	0,5	1	0	1	6,9	Moderate

Supplementary Table 5 continued…

Exposure	Reference	Comparison	Risk of bias	Precision	Heterogenenity	Directness	Publication bias	Funding bias	Effect size	Dose-response	Sum	NutriGrade
Red meat	Schwingshackl 2017[226]	Dose-response	2	1	1	1	1	1	0	1	8	High
Processed meat	Schwingshackl 2017[226]	Dose-response	2	1	1	1	0,5	1	1	1	8,5	High
Hamburger	Aune 2009[232]	Dose-response	1,5	0	0	1	0	1	0	1	4,5	Low
Bacon	Micha 2010[233]	Dose-response	2	1	0	1	0	1	2	1	8	High
Hot Dogs	Micha 2010[233]	Dose-response	2	1	0	1	0	1	1	1	7	Moderate
Poultry	Feskens 2013[231]	Dose-response	2	0	0	1	0	1	0	0	4	Low
Processed red meat	Pan 2011[234]	Dose-response	1	1	0,4	1	0	1	1	1	6,4	Moderate
Unprocessed red meat	Feskens 2013[231]	Dose-response	2	0	0,8	1	0,5	1	0	0	5,3	Low
Total fish/seafood	Schwingshackl 2017226	Dose-response	1,5	0	1	0,5	1	1	0	0	5	Low
Lean fish	Zhang 2013[235]	High v low	1,5	1	0	1	0	1	0	0	4,5	Low
Oily fish	Zhang 2013[235]	High v low	1,5	1	0	1	0	1	0	0	4,5	Low
Shellfish	Zhang 2013[235]	High v low	2	0	0	1	0	1	0	0	4	Low
Fish	Zhang 2013[235]	High v low	1,5	0	0,4	1	0,5	1	0	0	4,4	Low
Butter	Pimpin 2016[236]	Dose-response	1,5	0	0,4	1	0,5	1	0	0	4,4	Low
Olive oil	Schwingshackl 2017b[237]	Dose-response	1,5	1	0	1	0	1	0	1	5,5	Low
Potatoes	Schwingshackl 2018[238]	Dose-response	1,5	1	0,4	1	0	1	0	1	5,9	Low
French fries	Schwingshackl 2018[238]	Dose-response	1,5	1	0	1	0	1	1	1	6,5	Moderate
Boiled/baked mashed potatoes	Schwingshackl 2018[238]	Dose-response	1,5	1	0	1	0	1	0	1	5,5	Low
Whole grain	Schwingshackl 2017[226]	Dose-response	2	1	1	1	1	1	0	1	8	High
Refined grain	Schwingshackl 2017[226]	Dose-response	1,5	1	1	1	1	1	0	0	6,5	Moderate
Total grains	Aune 2013[239]	Dose-response	1,5	0	0	1	0	1	0	1	4,5	Low
Whole grain bread	Aune 2013[239]	Dose-response	1,5	0	0	1	0	1	1	1	5,5	Low
Whole grain cereals	Aune 2013[239]	Dose-response	1,5	0	0	1	0	1	1	1	5,5	Low
Wheat bran	Aune 2013[239]	Dose-response	1,5	1	0	1	0	1	1	1	6,5	Moderate
Wheat germ	Aune 2013[239]	Dose-response	1,5	1	0	1	0	1	0	0	4,5	Low
Rice	Saneei 2017[240]	High v low	1,5	0	0,4	1	0,5	1	0	0	4,4	Low
White rice	Aune 2013[239]	Dose-response	1,5	1	0,4	1	0	1	1	1	6,9	Moderate
Brown rice	Aune 2013[239]	Dose-response	1,5	1	0	1	0	1	0	1	5,5	Low
Soy products	Tian 2017[241]	High v low	1	0	0,4	1	0,5	0,5	0	0	3,4	Very low
Legumes	Schwingshackl 2017[226]	Dose-response	1,5	1	1	0,5	0,5	1	0	0	5,5	Low
Nuts	Schwingshackl 2017[226]	Dose-response	1,5	1	0,5	1	0,5	1	0	0	5,5	Low
Fruits and vegetables	Li 2014[242]	Dose-response	1	1	0	1	0	1	0	0	4	Low
Fruit total	Schwingshackl 2017[226]	Dose-response	1,5	1	1	1	1	1	0	0	6,5	Moderate
Berry fruits	Guo 2016[243]	Dose-response	1,5	1	0	1	0	1	0	1	5,5	Low
Citrus fruits	Jia 2016[244]	High v low	1	0	0,4	1	0,5	1	0	0	3,9	Very low
Apples and pears	Guo 2017[245]	Dose-response	1,5	1	0	1	0	1	0	1	5,5	Low
Vegetables total	Schwingshackl 2017[226]	Dose-response	1,5	1	1	1	1	1	0	0	6,5	Moderate

Supplementary Table 5 continued…

Exposure	Reference	Comparison	Risk of bias	Precision	Heterogenenity	Directness	Publication bias	Funding bias	Effect size	Dose-response	Sum	NutriGrade
Green leafy vegetables	Chen 2018[246]	Dose-response	1	1	0,4	1	0,5	1	0	0	4,9	Low
Cruciferous vegetables	Chen 2018[246]	Dose-response	2	1	0	1	0	1	0	0	5	Low
Yellow vegetables	Wang 2016[247]	High v low	1	0	0	1	0	1	1	0	4	Low
Tea	Yang WS 2014[192]	Dose-response	1,5	1	0,8	1	1	1	0	1	7,3	Moderate
Total coffee	Carlström 2018[249]	Dose-response	1,5	1	0,8	1	1	1	0	1	7,3	Moderate
Caffeinated coffee	Ding 2014[250]	Dose-response	1	1	0,8	1	1	1	0	1	6,8	Moderate
Decaffeinated coffee	Ding 2014[250]	Dose-response	1	1	0,8	1	1	1	0	1	6,8	Moderate
Sugar sweetened beverages	Imamura 2015[251]	Dose-response	1,5	1	0,8	1	1	1	1	1	8,3	High
Artificially sweetened beverages	Imamura 2015[251]	Dose-response	1,5	1	0,4	1	0	1	1	1	6,9	Moderate
Total fruit Juice	Imamura 2015[251]	Dose-response	1,5	1	0,4	1	0	1	0	1	5,9	Low
Sugar-sweetened fruit juice	Xi 2014[252]	High v low	1,5	1	0	1	0	1	1	0	5,5	Low
100% fruit juice	Xi 2014[252]	High v low	1,5	0	0	1	0	1	0	0	3,5	Very low
Fruit juice, not specifed	Xi 2014[252]	High v low	1,5	0	0	1	0	1	0	0	3,5	Very low
Total alcohol	Li 2016[33]	Non-linear dose-response	1,5	1	0,8	1	1	1	0	1	7,3	Moderate
Total alcohol	Li 2016[33]		1,5	1	0,8	1	1	1	1	1	8,3	High
Total alcohol	Li 2016[33]		1,5	1	0,8	1	1	1	0	0	6,3	Moderate
Wine	Huang 2017[253]	Non-linear dose-response	1	1	0,4	1	0	1	0	1	5,4	Low
Wine	Huang 2017[253]		1	1	0,4	1	0	1	0	1	5,4	Low
Wine	Huang 2017[253]		1	1	0,4	1	0	1	0	1	5,4	Low
Beer	Huang 2017[253]	Non-linear dose-response	1	1	0,4	1	1	1	0	0	5,4	Low
Beer	Huang 2017[253]		1	1	0,4	1	1	1	0	1	6,4	Moderate
Beer	Huang 2017[253]		1	1	0,4	1	1	1	0	0	5,4	Low
Spirits	Huang 2017[253]	Non-linear dose-response	1	1	0,4	1	1	1	0	0	5,4	Low
Spirits	Huang 2017[253]		1	1	0,4	1	1	1	0	0	5,4	Low
Spirits	Huang 2017[253]		1	0	0	1	1	1	1	0	5	Low
MACRONUTRIENTS												
Total protein	Zhao 2018[254]	Dose-response	1,5	1	0,4	1	0,5	1	0	1	6,4	Moderate
Animal protein	Zhao 2018[254]	Dose-response	1,5	1	0,4	1	0,5	1	0	1	6,4	Moderate
Animal protein-to-potassium ratio	Jayedi 2018[255]	Dose-response	2	1	0	1	0	1	0	1	6	Moderate
Plant protein	Zhao 2018[254]	Dose-response	1,5	1	0,4	1	0,5	1	0	0	5,4	Low
Total fat	Alhazmi 2012[256]	High v low	1,5	1	0	1	0	1	0	0	4,5	Low
Animal fat	Alhazmi 2012[256]	High v low	1,5	1	0,4	1	0,5	1	0	0	5,4	Low
Vegetable fat	Alhazmi 2012[256]	High v low	1,5	1	0,4	1	0,5	1	1	0	6,4	Moderate
MUFAs	Alhazmi 2012[256]	High v low	1,5	1	0,4	1	0,5	1	0	0	5,4	Low

Supplementary Table 5 continued…

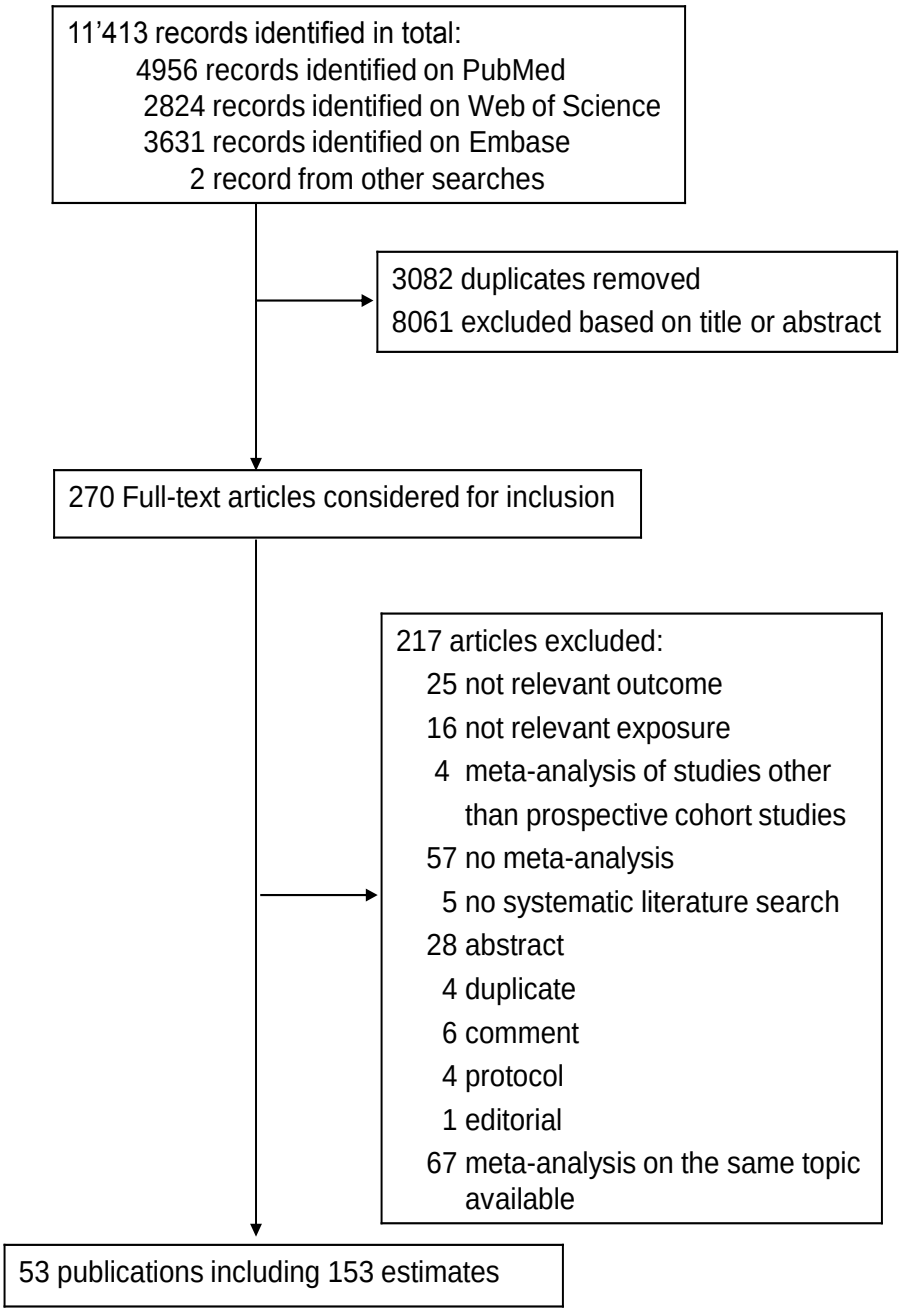
Exposure	Reference	Comparison	Risk of bias	Precision	Heterogeneity	Directness	Publication bias	Funding bias	Effect size	Dose-response	Sum	NutriGrade
Total omega-3 fatty acids	Zhou 2012[257]	High v low	1	1	0,4	1	0,5	1	0	0	4,9	Low
EPA & DHA	Wu 2012[258]	Dose-response	2	1	0,8	1	0,5	0	0	0	5,3	Low
EPA	Wu 2012[258]	Dose-response	2	0	0	1	0,5	1	0	0	4,5	Low
DHA	Wu 2012[258]	Dose-response	2	0	0	1	0,5	1	0	0	4,5	Low
ALA	Alhazmi 2012[256]	High v low	1,5	1	0,2	1	0,5	1	0	0	5,2	Low
Total omega-6 fatty acids	Alhazmi 2012[256]	High v low	1,5	0	0	1	0	1	0	0	3,5	Very low
PUFAs	Alhazmi 2012[256]	High v low	1,5	1	0	1	0,5	1	0	0	5	Low
Saturated fatty acids	De Souza 2015[259]	High v low	1	1	0,4	1	0	0,5	0	0	3,9	Very low
Trans-fatty acids	De Souza 2015[259]	High v low	1,5	0	0,4	1	0	0,5	0	0	3,4	Very low
Ruminant trans-fatty acids	De Souza 2015[259]	High v low	2	0	0	1	0	0,5	1	0	4,5	Low
Cholesterol	Tajima 2014[260]	Dose-response	1	1	0	1	0	1	0	1	5	Low
Total carbohydrates	Alhazmi 2012[256]	High v low	1,5	1	0,4	1	0,5	1	0	0	5,4	Low
Total sugars	Tsilas 2017[261]	Dose-response	1,5	0	0	1	0	0	0	0	2,5	Very low
Fructose	Tsilas 2017[261]	Dose-response	2	0	0	1	0	0	0	0	3	Very low
Glucose	Alhazmi 2012[256]	High v low	1,5	0	0	1	0	1	0	0	3,5	Very low
Lactose	Alhazmi 2012[256]	High v low	1,5	0	0	1	0	1	0	0	3,5	Very low
Maltose	Alhazmi 2012[256]	High v low	1,5	0	0	1	0	1	0	0	3,5	Very low
Sucrose	Tsilas 2017[261]	Dose-response	2	1	0	1	0	0	0	1	5	Low
Total fibre	Interact Consortium 2015[262]	Dose-response	1,75	1	0,8	1	1	1	0	1	7,55	Moderate
Cereal fibre	Interact Consortium 2015[262]	Dose-response	1,75	1	0,8	1	1	1	1	1	8,55	High
Fruit fibre	Interact Consortium 2015[262]	Dose-response	1,75	1	0,8	1	1	1	0	0	6,55	Moderate
Vegetable fibre	Interact Consortium 2015[262]	Dose-response	1,75	1	0,8	1	1	1	0	0	6,55	Moderate
Soluble fibre	Interact Consortium 2015[262]	Dose-response	1,75	0	0	1	0	1	1	0	4,75	Low
Insoluble fibre	Interact Consortium 2015[262]	Dose-response	1,75	0	0	1	0	1	1	1	5,75	Low
MICRONUTRIENTS												
Vitamin D	Zhao 2013[263]	High v low	1	1	0	1	0	0,5	0	0	3,5	Very low
Total iron	Bao 2012[264]	Dose-response	1,5	1	0	1	0	1	0	0	4,5	Low
Haem iron	Bao 2012[264]	Dose-response	1,5	1	0	1	0	1	0	1	5,5	Low
Magnesium	Fang Xuexian 2016[265]	Dose-response	2	1	0,8	1	0,5	1	0	1	7,3	Moderate
Calcium	Dong & Qin 2012[266]	High v low	1,25	1	0,4	1	0,5	0,5	0	0	4,65	Low
Total polyphenols	Rienks et al (2018)[267]	High v low	1	0	0	1	0	1	1	0	4	Low
Flavoinoids	Rienks et al (2018)[267]	Dose-response	1	1	0,4	1	0,5	1	0	0	4,9	Low
Anthocyanins	Guo 2016[243]	Dose-response	1,5	1	0	1	0	1	0	1	5,5	Low
Flavanols	Rienks et al (2018)[267]	High v low	1	1	0	1	0	1	1	0	5	Low
Flavan-3-ols	Rienks et al (2018)[267]	Dose-response	1	1	0	1	0	1	0	0	4	Low
Catechin	Rienks et al (2018)[267]	High v low	1	1	0	1	0	1	0	0	4	Low
Proanthocyanids	Rienks et al (2018)[267]	High v low	1	1	0	1	0	1	0	0	4	Low
Flavanones	Rienks et al (2018)[267]	High v low	1	1	0,2	1	0	1	0	0	4,2	Low

Supplementary Table 5 continued…

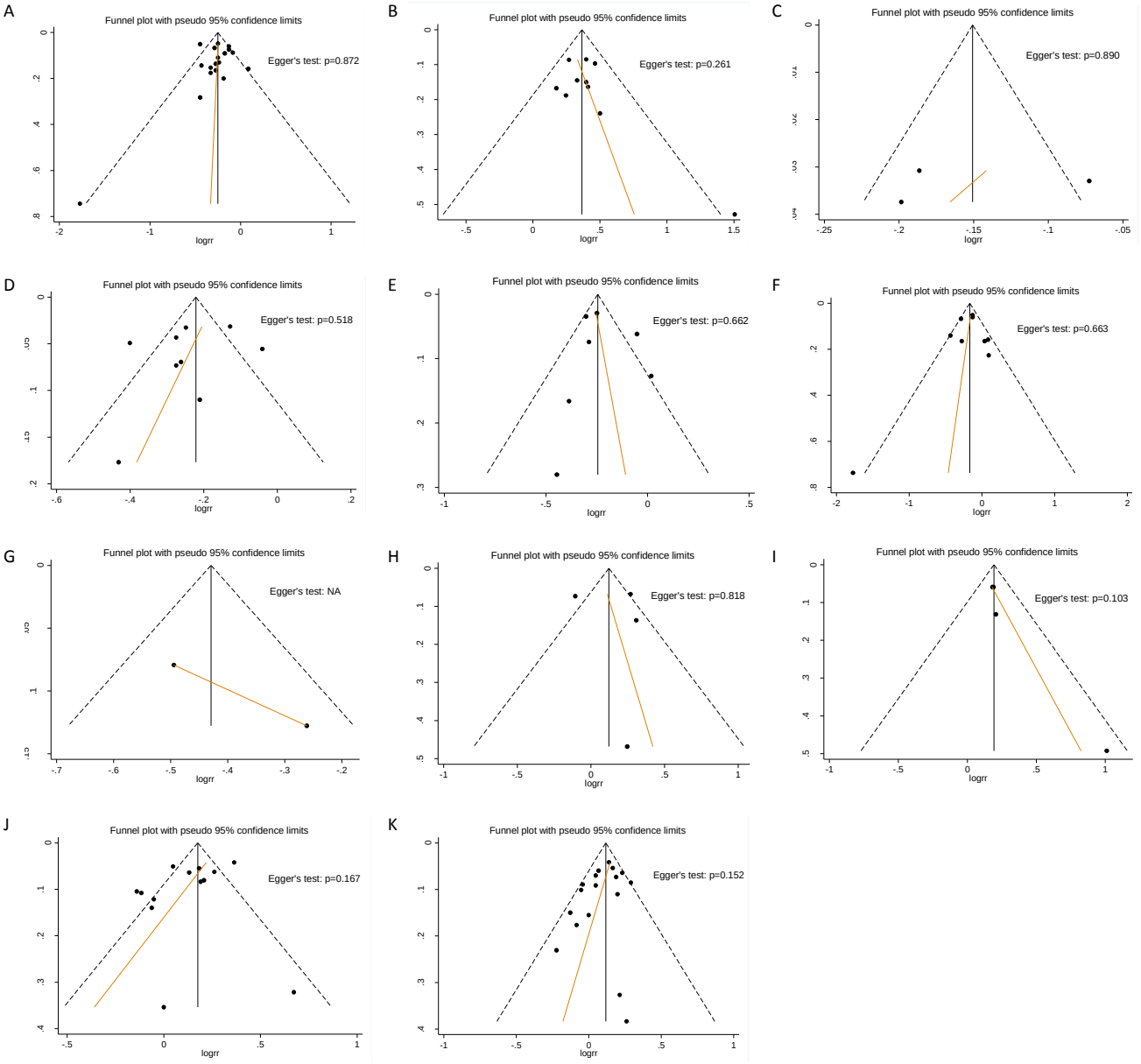
Exposure	Reference	Comparison	Risk of bias	Precision	Heterogenenity	Directness	Publication bias	Funding bias	Effect size	Dose-response	Sum	NutriGrade
Flavones	Rienks et al (2018)[267]	Dose-response	1	1	0	1	0	1	0	0	4	Low
Luteolin	Rienks et al (2018)[267]	Dose-response	1	0	0	1	0	1	0	0	3	Very low
Flavonoles	Rienks et al (2018)[267]	Dose-response	1	1	0,2	1	0,5	1	0	0	4,7	Low
Quercetin	Rienks et al (2018)[267]	Dose-response	1	1	0	1	0	1	0	0	4	Low
Kaempferol	Rienks et al (2018)[267]	Dose-response	1	1	0	1	0	1	0	0	4	Low
Myricetin	Rienks et al (2018)[267]	High v low	1	1	0	1	0	1	0	0	4	Low
Isoflavones	Rienks et al (2018)[267]	Dose-response	1	1	0,4	1	0,5	1	0	0	4,9	Low
Daidzein	Rienks et al (2018)[267]	Dose-response	1	1	0	1	0	1	0	0	4	Low
Genistein	Rienks et al (2018)[267]	Dose-response	1	1	0	1	0	1	0	0	4	Low
Dihydrochalcones	Rienks et al (2018)[267]	Dose-response	1	0	0	1	0	1	0	0	3	Very low
Phenolic acids	Rienks et al (2018)[267]	Dose-response	1	0	0	1	0	1	1	1	5	Low
Stilbenes	Rienks et al (2018)[267]	Dose-response	1	0	0	1	0	1	1	0	4	Low
Lignans	Rienks et al (2018)[267]	Dose-response	1	0	0	1	0	1	1	0	4	Very low
Others	Rienks et al (2018)[267]	Dose-response	1	0	0	1	0	1	0	0	3	Very low
Vitamin E	Hamer & Chida 2007[268]	High v low	1	0	0	1	0	0,5	1	0	3,5	Very low
Vitamin C	Hamer & Chida 2007[268]	High v low	1	0	0	1	0	0,5	1	0	3,5	Very low
Lycopene	Hamer & Chida 2007[268]	High v low	1	0	0	1	0	0,5	1	0	3,5	Very low
Caffeine	Ding 2014[250]	Dose-response	1	1	0,4	1	0	1	0	1	5,4	Low

* Modifications of original NutriGrade-scoring system: Precision: >5000 cases; Study quality Newcastle Ottawa Scale (NOS): >=8 (2 P); >=7-<8 (1.5P), >=6-<7(1 P)

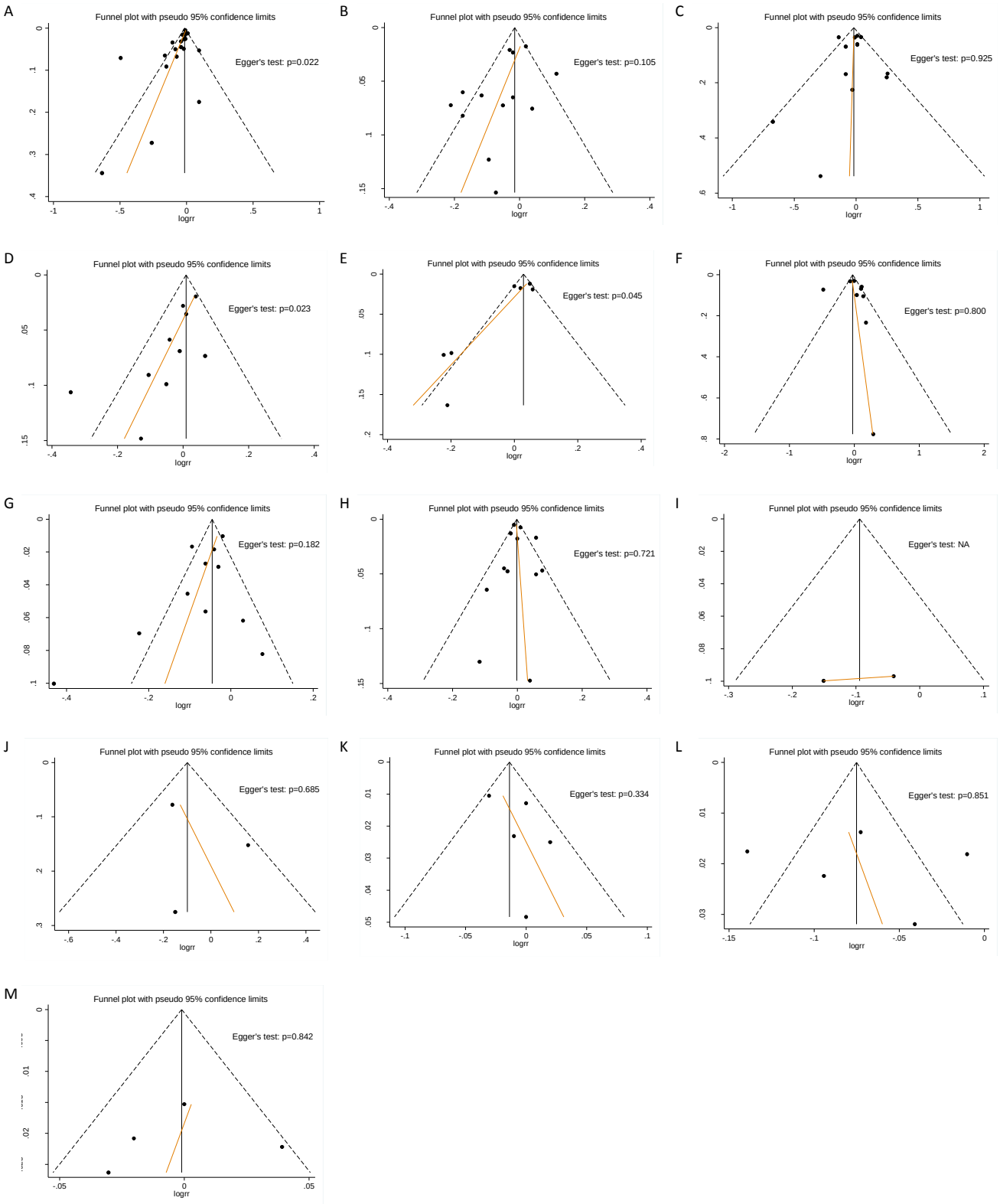
Supplementary Figure 1: Flow chart of the selection of published meta-analyses



Supplementery Figure 2: Funnel plots for the association between A) healthy dietary patterns, B) unhealthy dietary patterns, C) healthy eating index (HEI), D) the alternative healthy eating index (AHEI), E) dietary approaches to stop hypertension (DASH), F) the mediterranean diet, G) vegetarian diet, H) low carbohydrate diet, I) breaktfast skipping, J) glycemic index, K) glycemic load and incidence of type 2 diabetes. For each meta-analysis the study-specific estimates were plotted in the funnel.

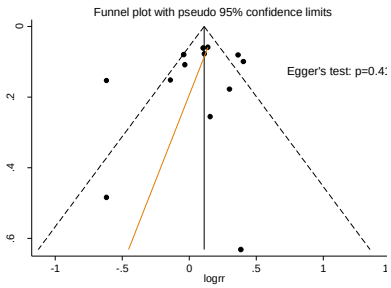


Supplementery Figure 3: Funnel plots for the association between A) total dairy (dose-response), B) low-fat dairy products (dose-response), C) high-fat dairy products (dose-response), D) milk (dose-response), E) low-fat milk (dose-response), F) high-fat milk (dose-response), G) yogurt (dose-response), H) cheese (dose-response), I) cottage cheese (high vs. low), J) fermented dairy products (high vs. low), K) cream (dose-response), L) ice cream (dose-response) and M) sherbet (dose-response) and incidence of type 2 diabetes. For each meta-analysis the study-specific estimates were plotted in the funnel.



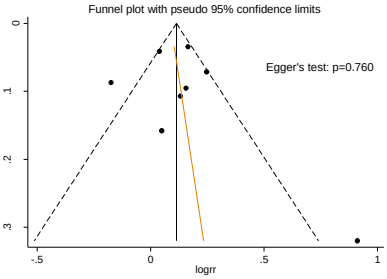
Supplementary Figure 4: Funnel plots for the association between A) eggs (dose-response) and incidence of type 2 diabetes. For each meta-analysis the study-specific estimates were plotted in the funnel.

A

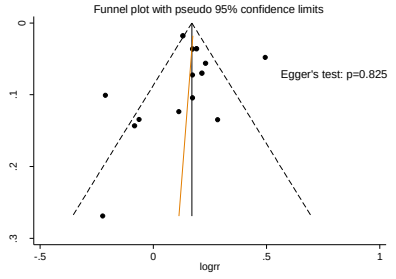


Supplementery Figure 5: Funnel plots for the association between A) total meat (dose-response), B) red meat (dose-response), C) processed meat (dose-response), D) poultry (dose-response), E) processed red meat (dose-response), F) unprocessed red meat (dose-response) and incidence of type 2 diabetes. For each meta-analysis the study-specific estimates were plotted in the funnel.

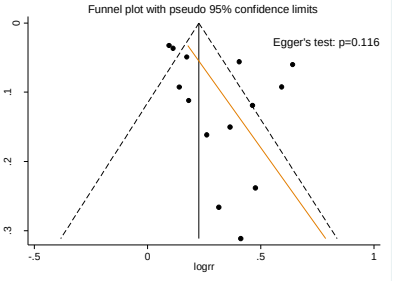
A



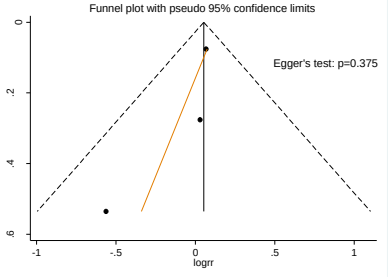
B



C



D



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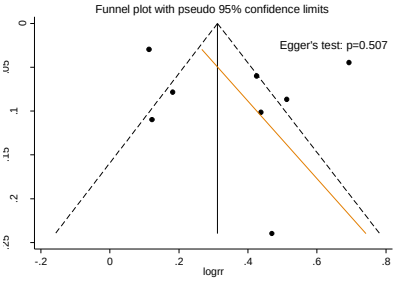
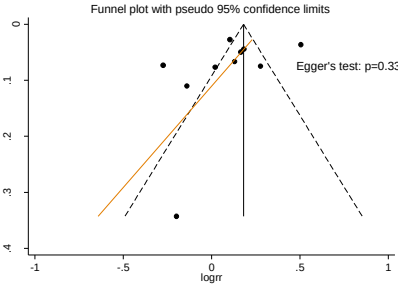
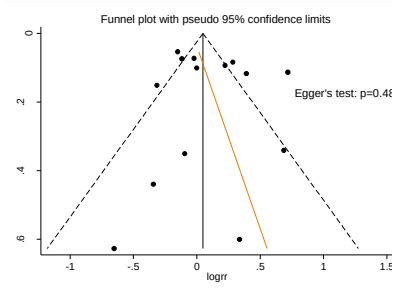


F

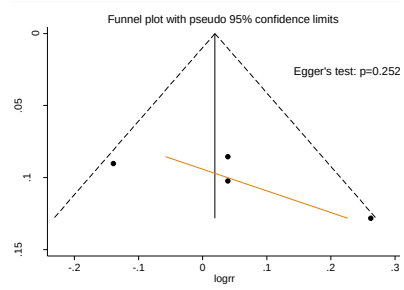


Supplementery Figure 6: Funnel plots for the association between A) total fish/seafood (dose-response), B) lean fish (high vs. low), C) oily fish (high vs. low), D) shellfish (high vs. low) and E) fish (high vs. low) and incidence of type 2 diabetes. For each meta-analysis the study-specific estimates were plotted in the funnel.

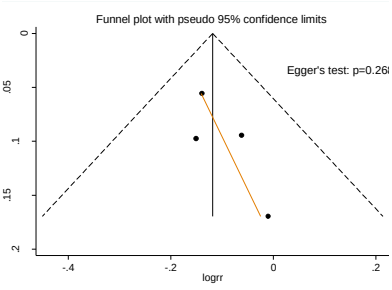
A



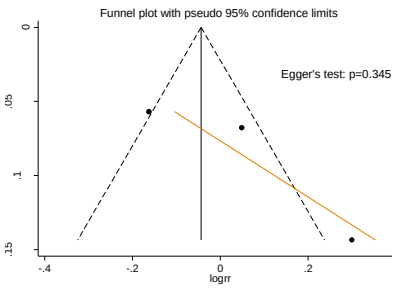
B



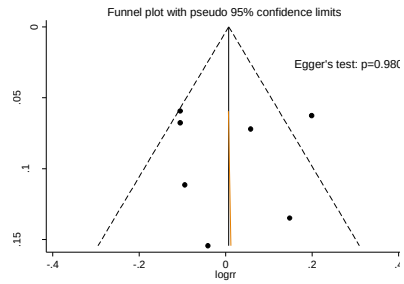
C



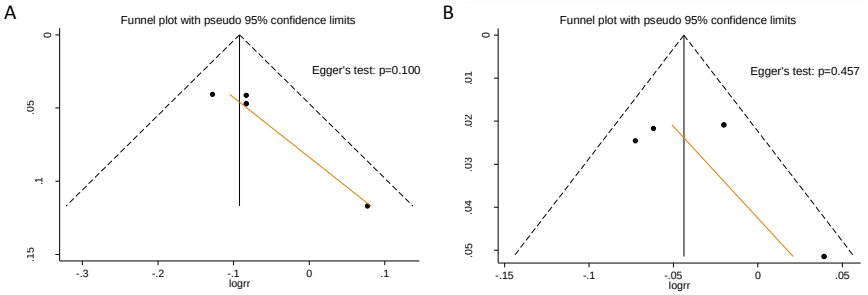
D



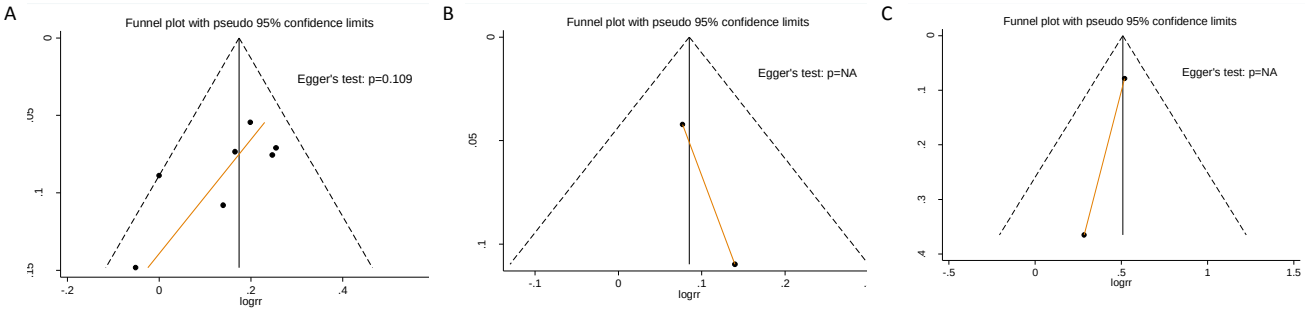
E



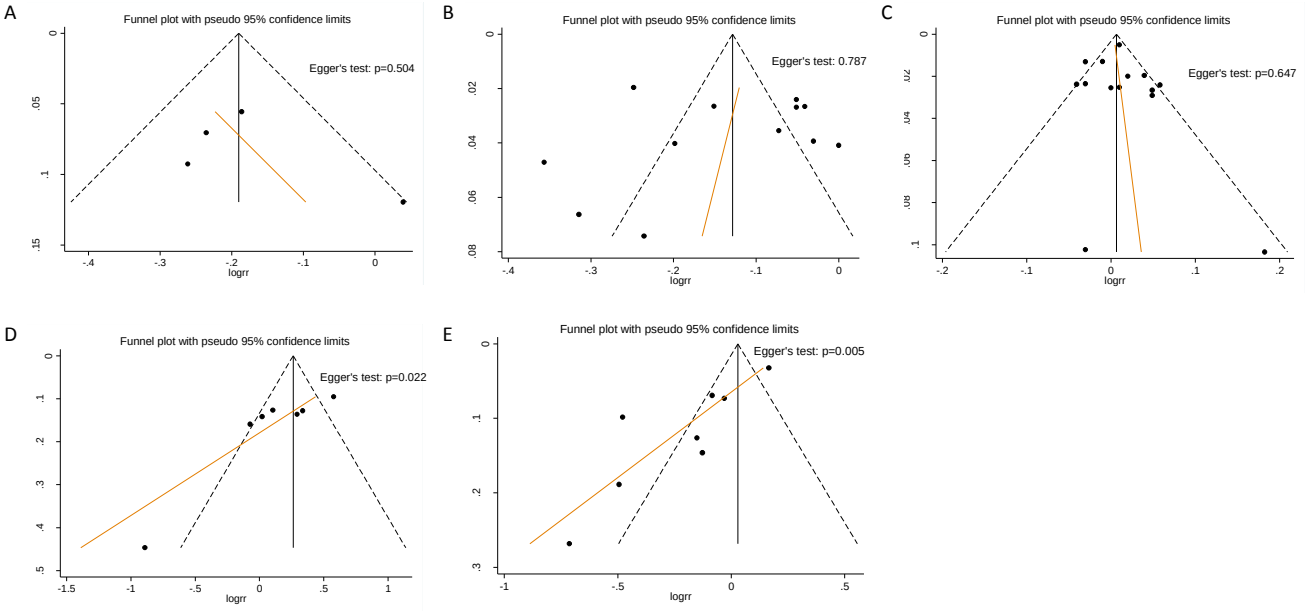
Supplementery Figure 7: Funnel plots for the association between A) olive oil (dose-response) and B) butter (dose-response) and incidence of type 2 diabetes. For each meta-analysis the study-specific estimates were plotted in the funnel.



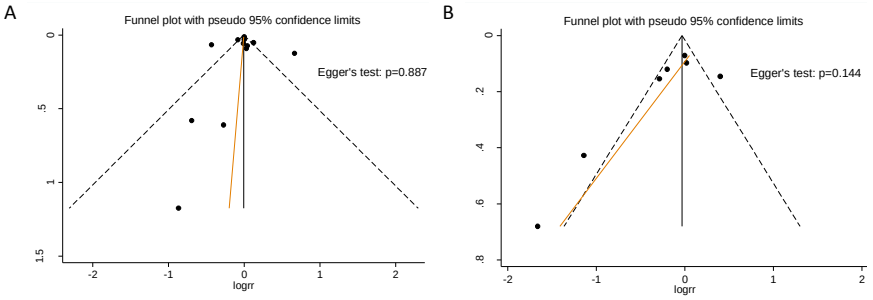
Supplementery Figure 8: Funnel plots for the association between A) total potatoes (dose-response), B) boiled/baked/mashed potatotes (dose-response), C) french fries (dose-response) and incidence of type 2 diabetes. For each meta-analysis the study-specific estimates were plotted in the funnel.



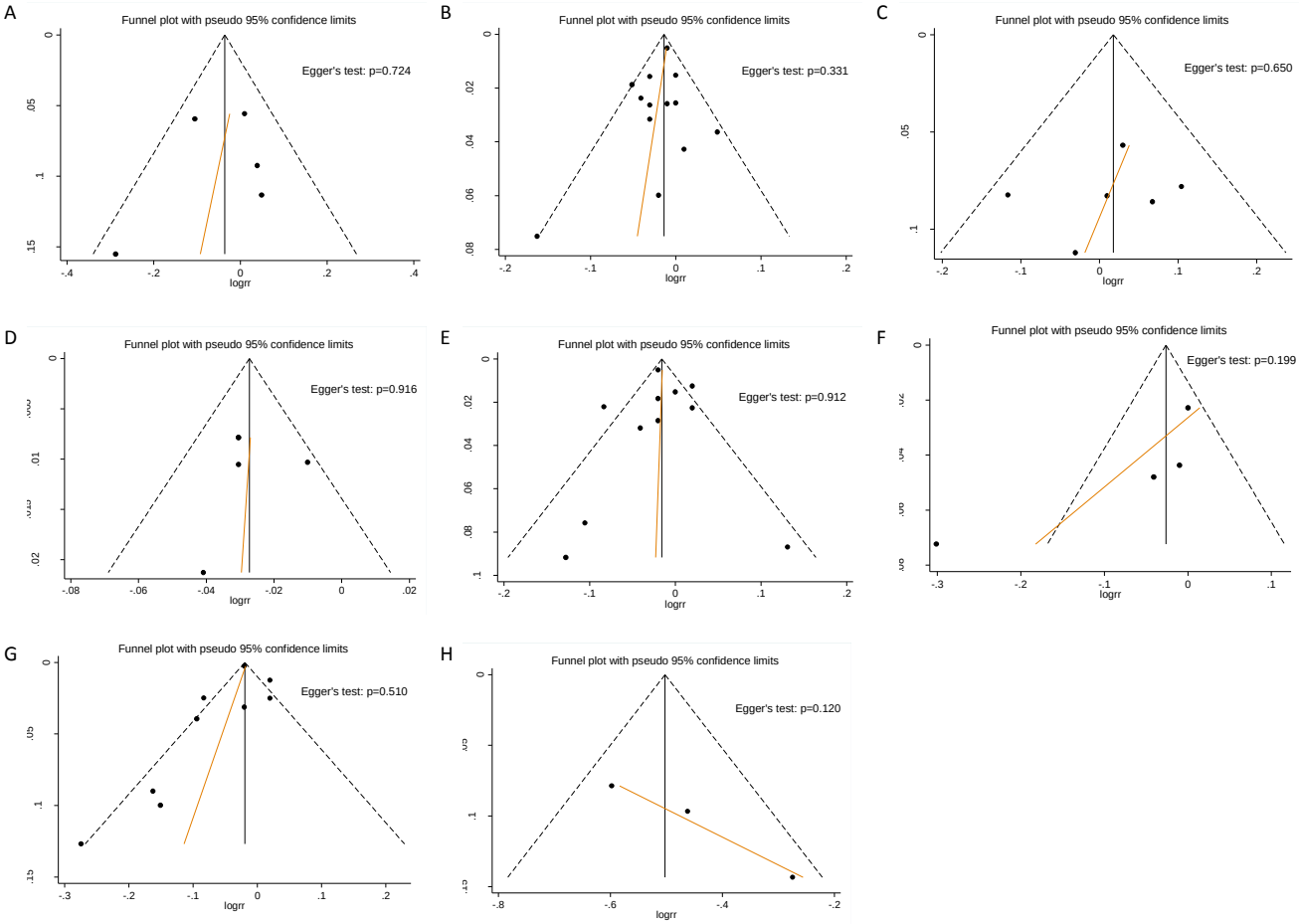
Supplementery Figure 9: Funnel plots for the association between A) total grains (dose-response), B) whole grain (dose-response), C) refined grain (dose-response), D) rice (high vs. low), E) soy products and incidence of type 2 diabetes. For each meta-analysis the study-specific estimates were plotted in the funnel.



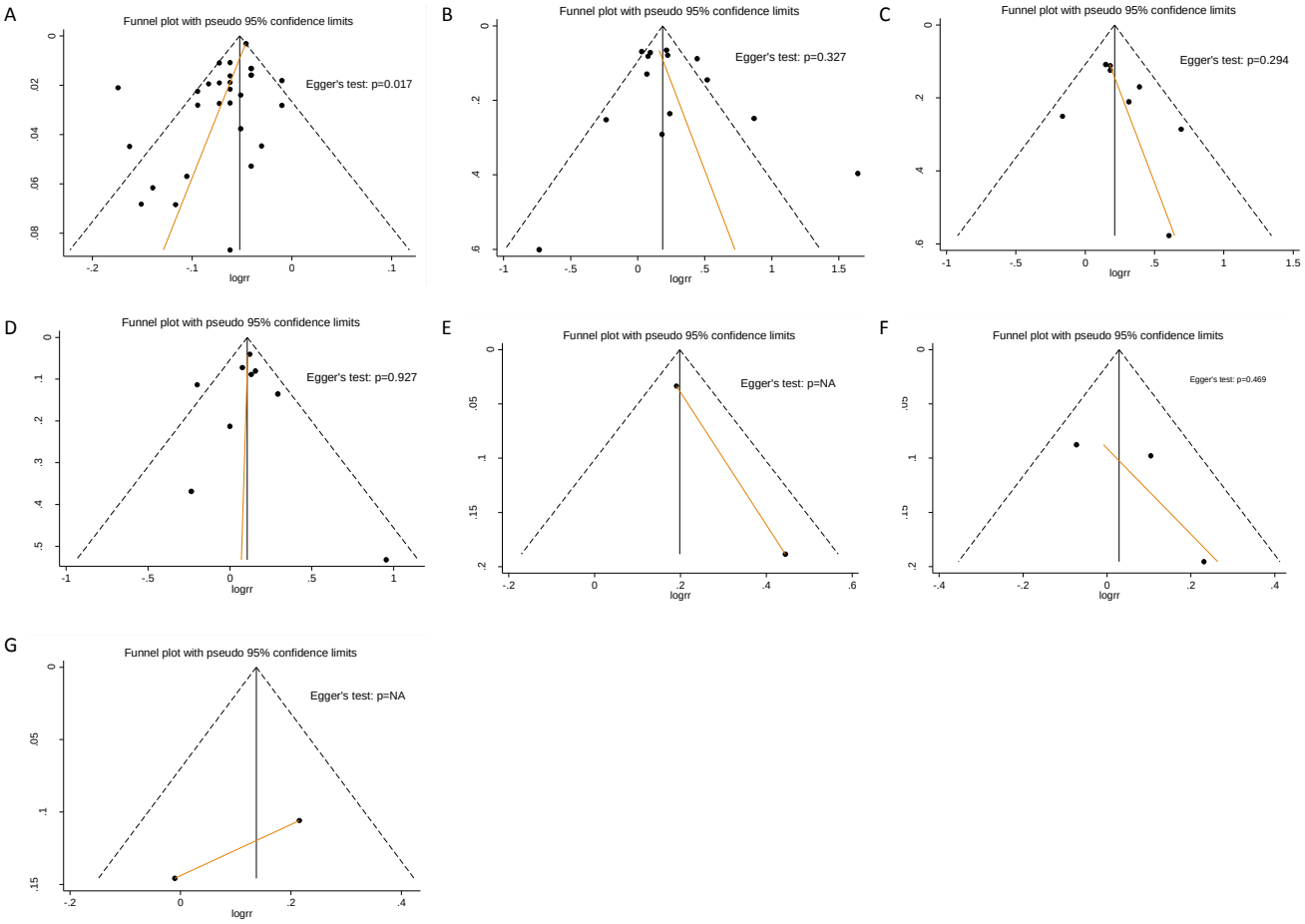
Supplementery Figure 10: Funnel plots for the association between A) legumes (dose-response), B) nuts (dose-response) and incidence of type 2 diabetes. For each meta-analysis the study-specific estimates were plotted in the funnel.



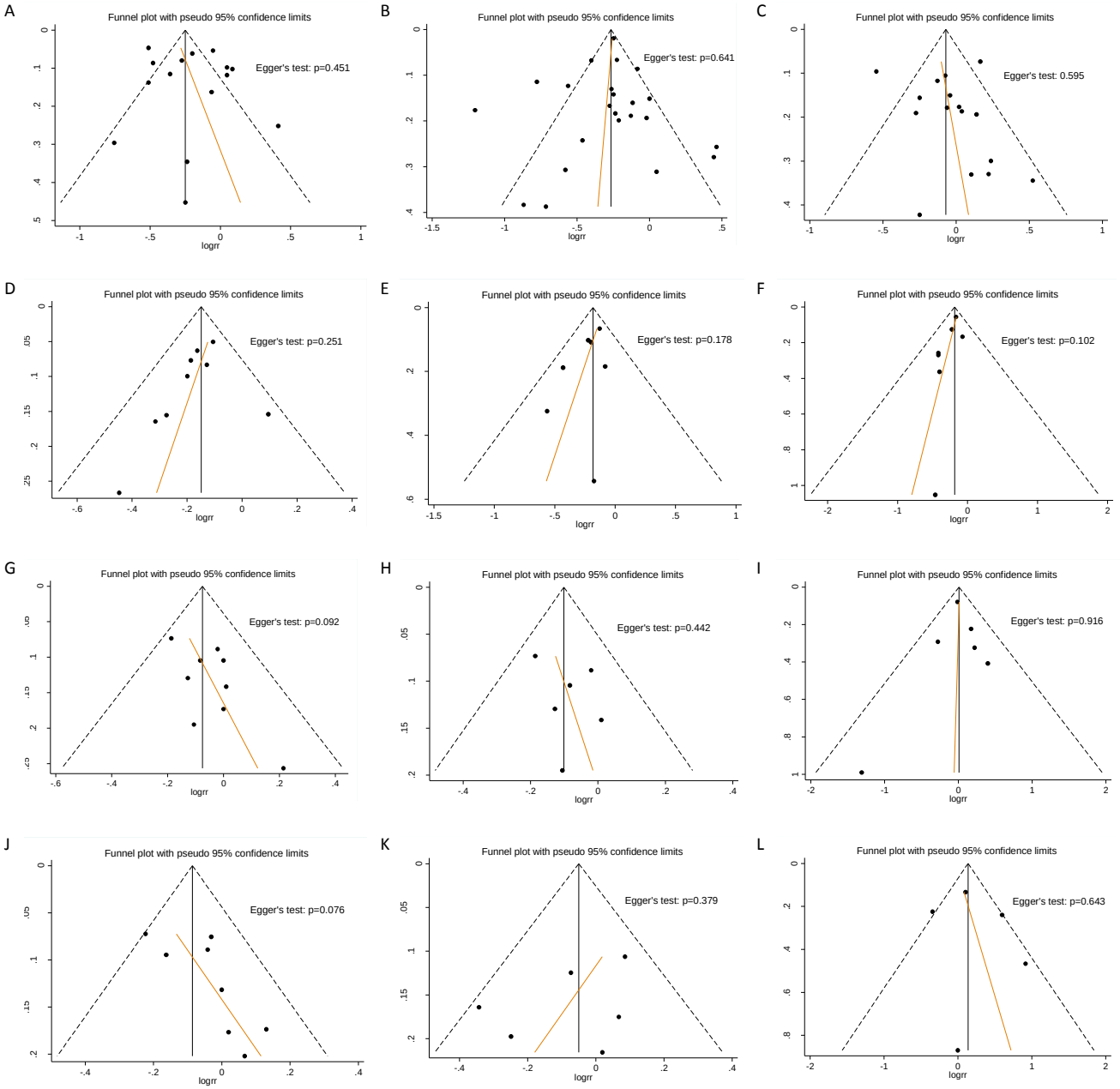
Supplementary Figure 11: Funnel plots for the association between A) fruits and vegetables (dose-response), B) fruit total (dose-response), C) citrus fruits (high vs. low), D) apples and pears (dose-response), E) vegetables total (dose-response), F) cruciferous vegetables (dose-response), G) green leafy vegetables (dose-response) and H) yellow vegetables (high vs. low) and incidence of type 2 diabetes. For each meta-analysis the study-specific estimates were plotted in the funnel.



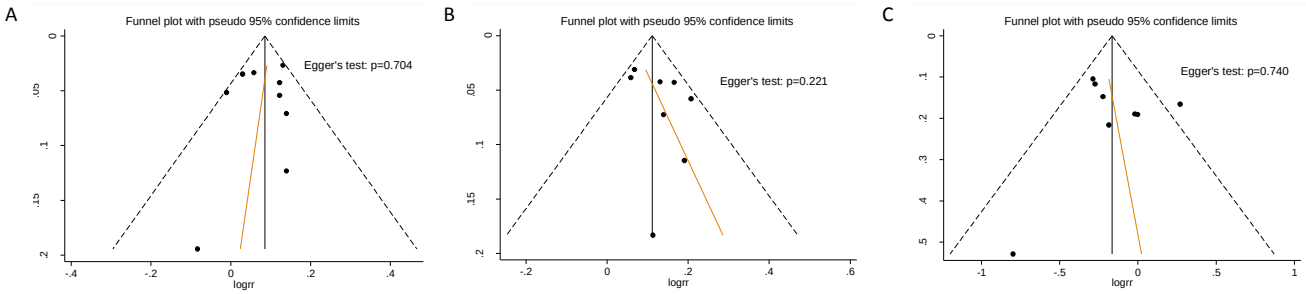
Supplementary Figure 12: Funnel plots for the association between A) total coffee (dose-response), B) sugar sweetened beverages (dose-response), C) artificially sweetened beverages (dose-response), D) total fruit juice (dose-response), E) sugar-sweetened fruit juice (high vs. low), F) 100% fruit juice (high vs. low) and G) fruit juice, not specified (high vs. low) and incidence of type 2 diabetes. For each meta-analysis the study-specific estimates were plotted in the funnel.



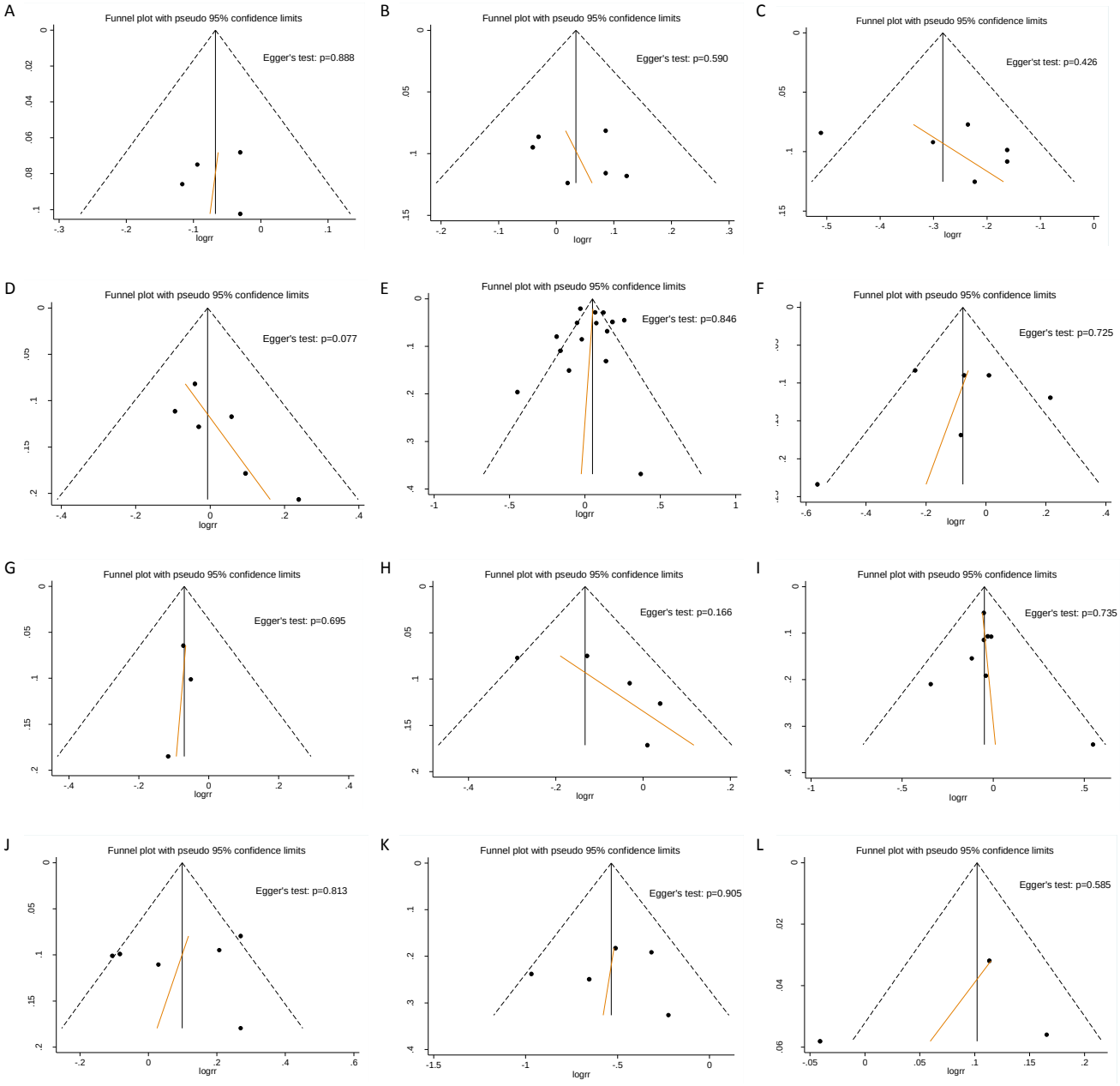
Supplementary Figure 13: Funnel plots for the association between A) total alcohol (light), B) total alcohol (moderate), C) total alcohol (heavy), D) wine (light), E) wine (moderate), F) wine (heavy), G) beer (light), H) beer (moderate), I) beer (heavy), J) spirits (light), K) spirits (moderate), L) spirits (heavy) and incidence of T2D. For each meta-analysis the study-specific estimates were plotted in the funnel.



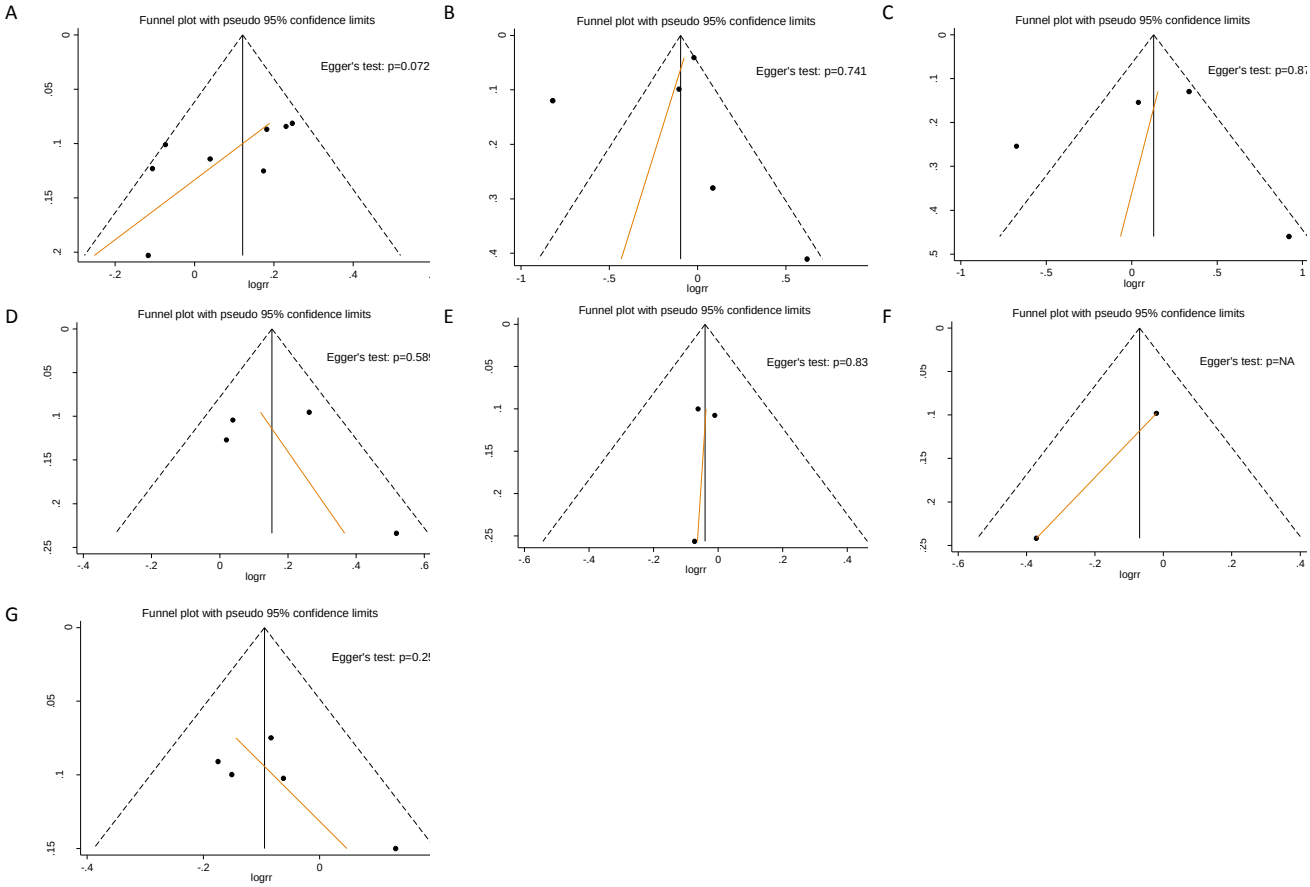
Supplementery Figure 14: Funnel plots for the association between A) total protein (dose-response), B) animal protein (dose-response), C) plant protein (dose-response) and incidence of type 2 diabetes. For each meta-analysis the study-specific estimates were plotted in the funnel.



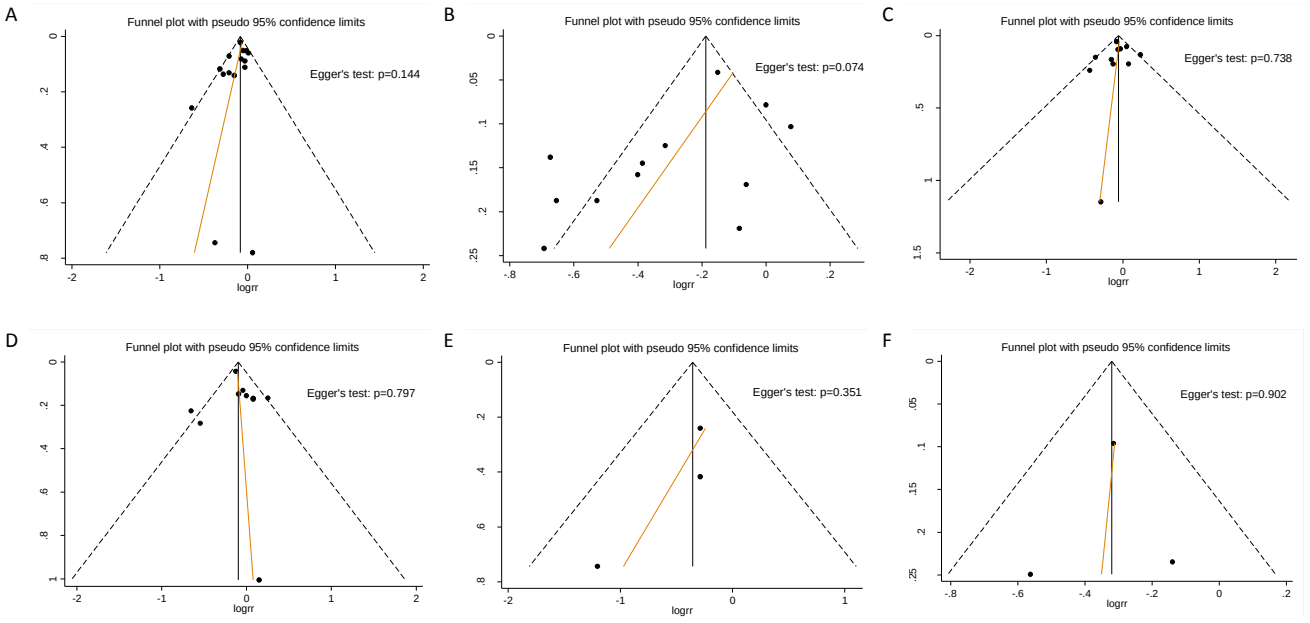
Supplementery Figure 15: Funnel plots for the association between A) total fat (high vs. low), B) animal fat (high vs. low), C) vegetable fat ((high vs. low), D) MUFAs (high vs. low), E) EPA & DHA (dose-response), F) ALA (high vs. low), G) total omega-6 fatty acids (high vs. low), H) PUFAs (high vs. low), I) saturated fatty acids (high vs. low), J) trans-fatty acids (high vs. low), K) ruminant trans-fatty acids (high vs. low), and L) cholesterol (dose-response) and incidence of type 2 diabetes. For each meta-analysis the study-specific estimates were plotted in the funnel.



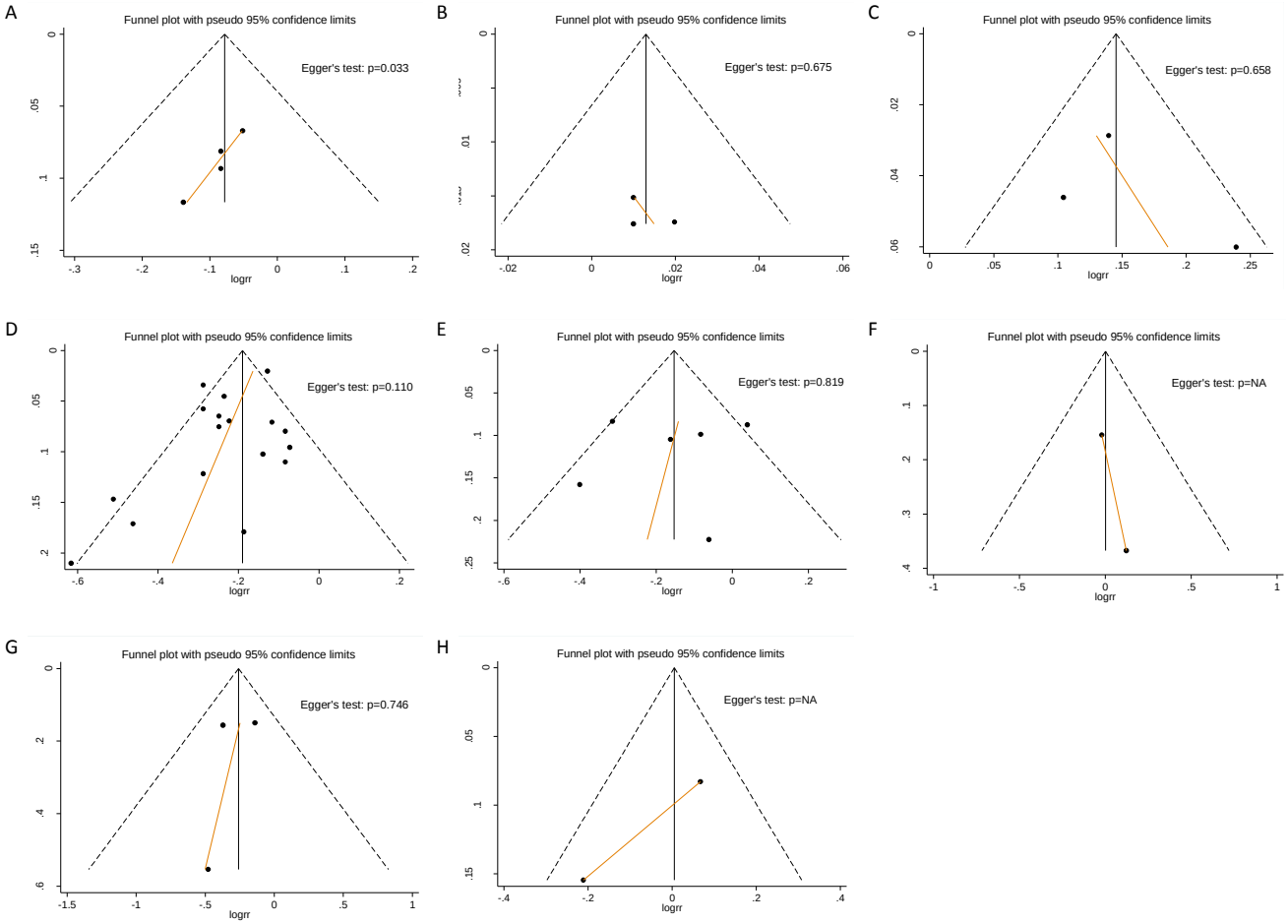
Supplementery Figure 16: Funnel plots for the association between A) total carbohydrates (high vs. low), B) total sugars (dose-response), C) fructose (dose-response), D) glucose (high vs. low), E) lactose (high vs. low), F) maltose (high vs. low), G) sucrose (dose-response) and incidence of type 2 diabetes. For each meta-analysis the study-specific estimates were plotted in the funnel.



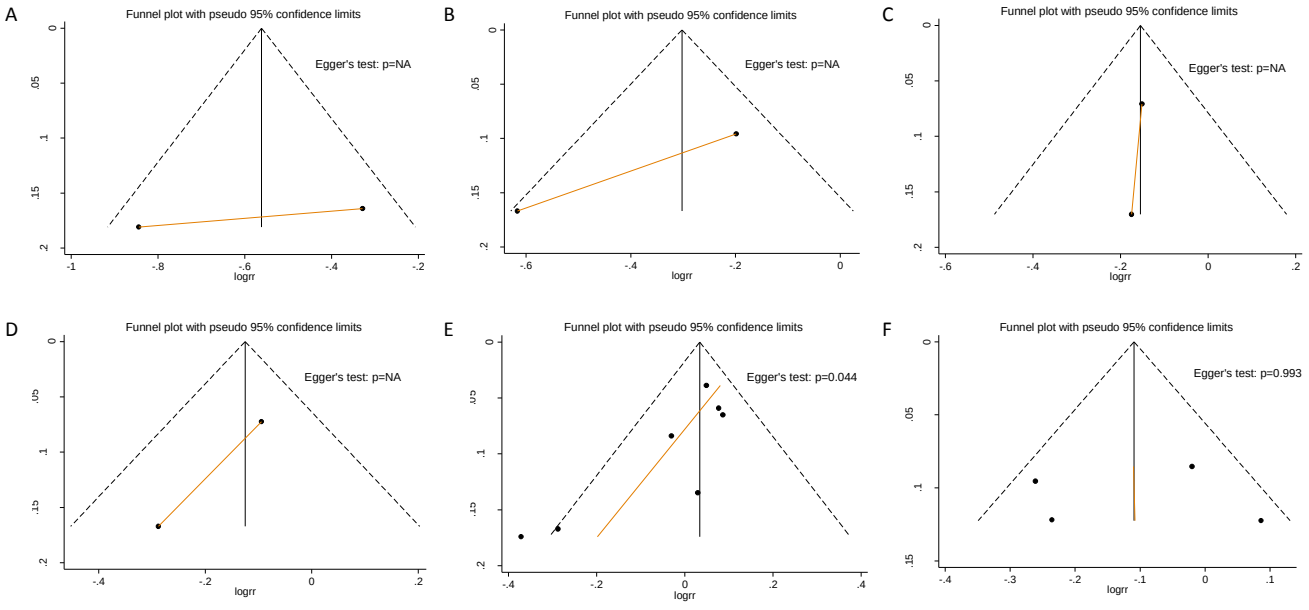
Supplementery Figure 17: Funnel plots for the association between A) total fibre (dose-response), B) cereal fibre (dose-response), C) fruit fibre (dose-response), D) vegetable fibre (dose-response), E) solube fibre (dose-response), F) insoluble fibre (dose-response) and incidence of type 2 diabetes. For each meta-analysis the study-specific estimates were plotted in the funnel.



Supplementery Figure 18: Funnel plots for the association between A) vitamin D (high vs. low), B) total iron (dose-response), C) heme iron (dose-response), D) magnesium (dose-response), F) vitamin E (high vs. low), G) vitamin C (high vs. low) and H) lycopene (high vs. low) and incidence of type 2 diabetes. For each meta-analysis the study-specific estimates were plotted in the funnel.



Supplementary Figure 19: Funnel plots for the association between A) total polyphenols (high vs low), B) flavanols (high vs low), C) catechin (high vs low), D) proanthocyanids (high vs low), E) flavanones (high vs low), F) Myricetin (high vs low) and incidence of T2D. For each meta-analysis the study-specific estimates were plotted in the funnel.



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