

Egg consumption and human health: an umbrella review of observational studies

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Supplementary Table 1. Summary results from meta-analyses investigating continuous linear exposure to egg consumption and health outcomes.

Outcome	Number of Studies	Exposure (increment)	RR	I2	Reference
Breast cancer	8	50 g/d	1.04 (0.94, 1.15)	26%	Wu J et al. 2016
CHD	7	1 serving/d	0.99 (0.85, 1.15)	0%	Rong et al. 2013
CHD mortality	4	1 serving/d	1.18 (0.71, 1.96)	0%	Rong et al. 2013
Prostate cancer	6	5 servings/w	1.00 (0.88, 1.14)	0%	Keum et al. 2015
Prostate cancer mortality	4	1-2 servings/w	1.23 (0.97, 1.55)	70%	Keum et al. 2015
Stroke	7	1 serving/d	0.91 (0.81, 1.02)	0%	Rong et al. 2013
Stroke mortality	3	1 serving/d	0.94 (0.81, 1.10)	0%	Rong et al. 2013
T2DM	13	3 servings/w	1.03 (0.96, 1.10)	78%	Wallin et al. 2016
Abbreviations: CHD (coronary heart disease); d (day); g (gram); RR (risk ratio); T2DM (type 2 diabetes); w (week).					

Supplementary Table 2. Significance and direction of results from selected meta-analyses on egg consumption and health outcomes.

Outcome	Main results	Adjustment				Subgroups					Reference
		BMI	Alcohol	Education	Smoking	Men	Women	US	Europe	Asia	
Breast cancer	NS	NS	NS	NA	NS	NA	NA	NS	NS	NS	Wu J et al. 2016
T2DM	NS	NA	NA	NA	NA	NA	NA	S+	NS	NS	Djousse et al. 2016
CHD	NS	NA	NA	NA	NA	NS	NS	NS	NA	NS	Alexander et al. 2016
Stroke	S-	NA	NA	NA	NA	NS	NS	S-	NA	NS	Alexander et al. 2016
Stroke hemorrhagic	S-	NA	NA	NA	NA	NA	NA	NA	NA	NA	Rong et al. 2013
Stroke ischaemic	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA	Rong et al. 2013
Fatal stroke	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA	Alexander et al. 2016
Ovarian cancer	NS	S+	NS	NA	S+	NA	NA	S+	NS	NS	Zeng et al. 2015
Gastrointestinal cancer	NS	NA	NA	NA	NA	NS	NS	S+	NS	NS	Tse et al. 2014
CVD	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA	Shin et al. 2013
CVD mortality	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA	Shin et al. 2013
Bladder cancer	NS	NA	NA	NA	NA	NS	NS	S+	NS	NS	Li F et al. 2013
Prostate cancer	NS	NA	NA	NA	NA	NA	NA	NS	NS	NS	Xie et al. 2012
Pancreatic cancer	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA	Paluszkiewicz et al. 2012
CHD mortality	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA	Shin et al. 2013
Prostate cancer mortality	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA	Xie et al. 2012

Abbreviations: BMI (body mass index); CHD (coronary heart disease); CVD (cardiovascular disease); NA (not applicable); NS (not significant); S (significant); T2DM (type 2 diabetes).
Symbols “+” and “-” denote direction of the association.

Supplementary Table 3. Characteristics and main findings of meta-analyses of cohort studies (highest vs. lowest category of exposure) on egg consumption on overlapping outcomes over time.

Outcome	Number Of Studies	Type Of Study Included	RR	I2	Reference
CHD	8	P	0.97 (0.88, 1.07)	0%	Alexander et al. 2016
CHD	5	P	0.97 (0.86, 1.09)	12%	Shin et al. 2013
CVD	8	P	0.96 (0.88, 1.05)	0%	Shin et al. 2013
CVD	9	P	1.16 (1.00, 1.34)	S	Li Y et al. 2013
Stroke	8	P	0.88 (0.81, 0.97)	7%	Alexander et al. 2016
Stroke	5	P	0.93 (0.81, 1.07)	0%	Shin et al. 2013
Stroke hemorrhagic	2	P	0.85 (0.56, 1.28)	38%	Alexander et al. 2016
Stroke hemorrhagic	3	P	0.75 (0.57, 0.99)	36%	Rong et al. 2013
Stroke ischaemic	4	P	0.92 (0.82, 1.02)	0%	Alexander et al. 2016
Stroke ischaemic	4	P	0.91 (0.82, 1.01)	0%	Rong et al. 2013
Stroke mortality	4	P	0.78 (0.52, 1.19)	38%	Alexander et al. 2016
Stroke mortality	3	P	0.92 (0.56, 1.50)	40%	Shin et al. 2013
T2DM	10	P	1.06 (0.86, 1.30)	73%	Djousse et al. 2016
T2DM	3	P	2.62 (1.48, 4.64)	NS	Li Y et al. 2013
Abbreviations: CHD (coronary heart disease); CVD (cardiovascular disease); NS (not significant); P (prospective); RR (risk ratio); S (significant); T2DM (type 2 diabetes).					

Supplementary Table 4. Results of meta-analyses (highest vs. lowest category of exposure) on egg consumption and health outcomes with limited number of prospective cohort studies (<3) or case-control studies (either alone or mixed with prospective cohort studies).

Outcome	Number of Studies	Type of Study Included	RR	I2	Reference
Colon cancer	NA	NA	1.29 (1.14, 1.46)	NS	Tse et al. 2014
Colorectal adenoma	NA	NA	1.23 (1.01, 1.51)	NR	Tse et al. 2014
Colorectal cancer	NA	NA	1.32 (1.13, 1.53)	S	Tse et al. 2014
Endometrial cancer	6 (1+5)	P+CC	1.38 (0.92, 2.08)	83%	Bandera et al. 2007
Esophageal cancer	NA	NA	1.25 (0.98, 1.61)	NR	Tse et al. 2014
Gastric cancer	NA	NA	1.07 (0.96, 1.20)	NR	Tse et al. 2014
Multiple myeloma	4 (1+3)	P+CC	1.17 (0.63, 2.18)	66%	Caini et al. 2016
Non-Hodgkin lymphoma	1	P	1.06 (0.88, 1.27)	NA	Dong et al. 2017
Rectal cancer	NA	NA	1.02 (0.89, 1.15)	NR	Tse et al. 2014
Abbreviations: CC (case-control); NA (not applicable); NR (not reported); NS (not significant); P (prospective); RR (risk ratio); S (significant).					

Supplementary Table 5. Variables investigated to address the strength of evidence from selected meta-analyses on egg consumption and health outcomes.

Outcome	Heterogeneity	Dose-response analysis	Agreement over time	Potential confounding	Reference
Cancer (bladder)	∅	○	⊕	○	Li F et al. 2013
Cancer (breast)	∅	⊕	⊕	∅	Wu J et al. 2016
Cancer (gastrointestinal)	○	○	○	○	Tse et al. 2014
Cancer (ovarian)	∅	○	⊕	○	Zeng et al. 2015
Cancer (pancreas)	∅	○	○	○	Paluszkiewicz et al. 2012
Cancer (prostate fatal)	∅	⊕	⊕	○	Xie et al. 2012
Cancer (prostate)	∅	⊕	∅	∅	Xie et al. 2012
CHD	∅	⊕	⊕	∅	Alexander et al. 2016
CVD	∅	○	∅	○	Shin et al. 2013
Mortality (CHD)	∅	⊕	○	○	Shin et al. 2013
Mortality (CVD)	⊕	⊕	⊕	○	Shin et al. 2013
Stroke (fatal)	∅	⊕	⊕	○	Alexander et al. 2016
Stroke (hemorrhagic)	∅	○	∅	○	Rong et al. 2013
Stroke (ischaemic)	∅	○	⊕	○	Rong et al. 2013
Stroke (total)	∅	⊕	∅	⊕	Alexander et al. 2016
T2DM	⊕	⊕	∅	⊕	Djousse et al. 2016

Abbreviations: CHD (coronary heart disease); CVD (cardiovascular disease); T2DM (type 2 diabetes); ○ (denotes lacking information); ∅ (denotes “no”); ⊕ (denotes “yes”).