Supplement Figure and Tables

Supplementary Figure 1. 8-Year HRs and 95% CIs for All-Cause and Cause-Specific Mortality per Increase in One Serving/day of Total Red Meat and Subtypes of Red Meat Consumption in 8 Years.

Supplementary Table 1. Categories for causes of death.

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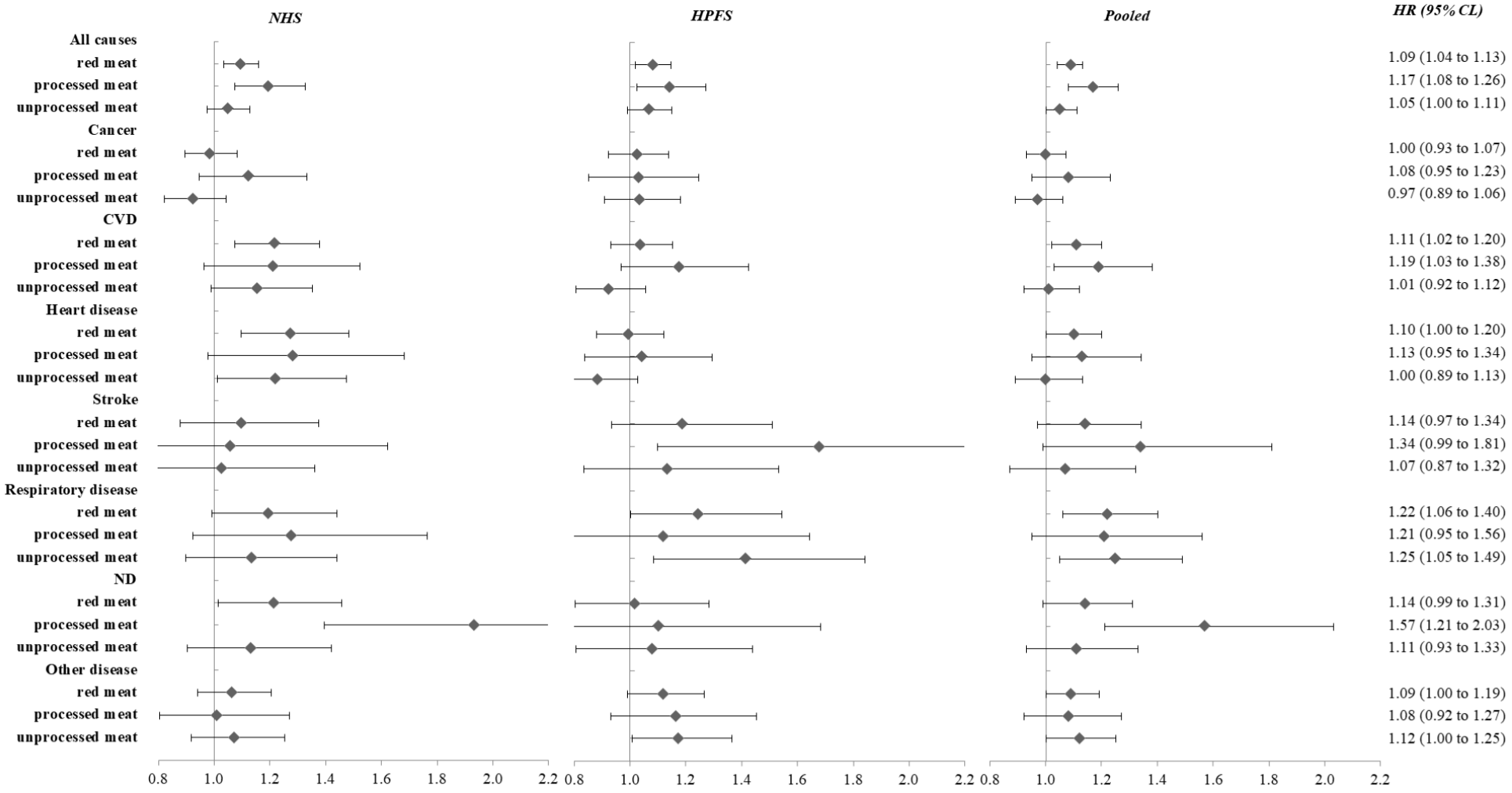
Supplementary Table 4. Overall 12-Year HRs and 95% CIs for Mortality Risk According to Updated 12-Year Change in Total Red Meat Intake in NHS (1986-2010) and HPFS (1986-2010).

Supplementary Table 5. HRs and 95% CIs for 8-year all-cause mortality associated with one serving/day increased consumption of food groups during an 8-year course in the individual cohorts of NHS, HPFS and pooled findings

Supplementary Table 6. HRs and 95% CIs for 4-year all-cause mortality associated with one serving/day decreased intake of red meat and concomitant increased intake of another major dietary protein source, whole grain, or vegetables during a 4-year course in the individual cohorts of NHS, HPFS and pooled findings.

Supplementary Table 7. HRs and 95% CIs for 12-year all-cause mortality associated with one serving/day decreased intake of red meat and concomitant increased intake of another major dietary protein source, whole grain, or vegetables during a 12-year course in the individual cohorts of NHS, HPFS and pooled findings.

Supplemental Figure 1. 8-Year HRs and 95% CIs for All-Cause and Cause-Specific Mortality per Increase in One Serving/day of Total Red Meat and Subtypes of Red Meat Consumption in 8 Years.



CI, confidence interval; CVD, cardiovascular disease; HPFS, Health Professionals Follow-up Study; HR, hazard ratio; ND, neurodegenerative disease; NHS, Nurses' Health Study.

Supplementary Table 1. Categories for causes of death

Causes of death	ICD-8 code	ICD-9 code
Cancer	140-207	140-208
Cardiovascular disease	390-458	390-459
Heart disease	390-429 and 440-458	390-429 and 440-459
Stroke	430-438	430-438
Respiratory disease	460-519	460-519
Neurodegenerative disease	290, 340, 342, and 348	290, 332, 335, and 340
All other cause	The rest of the ICD codes.	

Supplementary Table 2. Overall 8-Year HRs and 95% CIs for Mortality Risk According to Updated 8-Year Change in Total Red Meat Intake in NHS (1986-2010) and HPFS (1986-2010)

	Changes in frequency of red meat consumption (categories in servings per day)					
	decrease		no change (reference)	increase		p for trend
	>0.5	0.15-0.5		0.15-0.5	>0.5	
NHS (N=53,560)						
red meat						
model 3	0.96 (0.89,1.04)	0.98 (0.92,1.04)	1	1.06 (0.99,1.13)	1.10 (1.01,1.19)	0.003
processed meat						
model 3	1.00 (0.88,1.14)	0.97 (0.89,1.05)	1	1.09 (1.02,1.17)	1.21 (1.07,1.37)	0.002
unprocessed meat						
model 3	0.99 (0.91,1.08)	1.01 (0.95,1.07)	1	1.06 (0.99,1.13)	1.05 (0.95,1.16)	0.22
HPFS (N=27,423)						
red meat						
model 3	0.96 (0.87,1.06)	1.01 (0.92,1.10)	1	1.04 (0.95,1.13)	1.09 (0.99,1.19)	0.02
processed meat						
model 3	0.94 (0.82,1.08)	1.01 (0.92,1.11)	1	1.13 (1.05,1.23)	1.02 (0.91,1.15)	0.05
unprocessed meat						
model 3	0.99 (0.89,1.10)	1.06 (0.97,1.15)	1	1.01 (0.93,1.10)	1.13 (1.03,1.24)	0.08
Pooled-results						
red meat						
model 3	0.96 (0.91, 1.02)	0.99 (0.94, 1.04)	1	1.05 (0.99, 1.11)	1.09 (1.03, 1.16)	0.0002
processed meat						
model 3	0.97 (0.88, 1.07)	0.98 (0.93, 1.05)	1	1.11 (1.05, 1.17)	1.10 (1.01, 1.20)	0.0003
unprocessed meat						
model 3	0.99 (0.93, 1.06)	1.03 (0.98, 1.08)	1	1.04 (0.98, 1.09)	1.09 (1.02, 1.17)	0.04

CI: confidence interval; HPFS: Health Professionals Follow-up Study; HR: hazard ratio; NHS: Nurses' Health Study.

Model 3: adjusted for all covariates in the full model (i.e., age (months), race (white/nonwhite), initial consumption of red meat (in quintile), initial BMI (<23, 23−24.9, 25−29.9, 30−34.9, and ≥35 kg/m2), family history of MI, diabetes or cancer, updated aspirin use, multivitamin use, menopause and HT status (only for women), and simultaneous changes in other lifestyle factors: smoking status (never to never, never to current, pasta to past, past to current, current to past, current to current or missing indicator) and initial and changes (all in quintiles) in physical activity, alcohol drink, and total energy intake, and other food groups, i.e., vegetables, fruits, whole grains, and sugar sweetened beverage), and weight change (quintiles) and initial status of hypertension, diabetes, and hypercholesterolemia.

Supplementary Table 3. Overall 4-Year HRs and 95% CIs for Mortality Risk According to Updated 4-Year Change in Total Red Meat Intake in NHS (1986-2010) and HPFS (1986-2010)

	Changes in frequency of red meat consumption (categories in servings per day)					
	decrease		no change (reference)	increase		p for trend
	>0.5	0.15-0.5	± 0.14	0.15-0.5	>0.5	
NHS (N=52,415)						
red meat						
cases/person-years	1107/164155	1593/222120	4404/347366	1158/162329	732/87366	
model 2	0.98(0.90,1.07)	0.99(0.92,1.05)	1	1.00(0.93,1.07)	1.16(1.07,1.27)	0.005
processed meat						
cases/person-years	247/29774	858/122885	6976/730624	735/82309	178/17744	
model 2	1.16(1.00,1.33)	0.99(0.91,1.08)	1	1.18(1.09,1.28)	1.24(1.06,1.44)	0.02
unprocessed meat						
cases/person-years	756/114080	1584/218785	5028/426308	1123/158876	503/65288	
model 2	1.02(0.92,1.12)	1.01(0.95,1.08)	1	1.03(0.96,1.10)	1.14(1.04,1.26)	0.09
HPFS (N=30,915)						
red meat						
cases/person-years	1008/89119	930/97660	3659/202384	926/93985	958/74337	
model 2	1.09(0.99,1.19)	1.01(0.92,1.10)	1	1.04(0.96,1.14)	1.24(1.14,1.35)	0.005
processed meat						
cases/person-years	311/24807	759/68589	5262/379667	810/62926	339/21497	
model 2	1.17(1.02,1.34)	1.11(1.01,1.21)	1	1.17(1.08,1.27)	1.23(1.10,1.39)	0.09
unprocessed meat						
cases/person-years	753/64168	933/100394	4196/245146	963/94419	636/53360	
model 2	1.06(0.96,1.17)	0.92(0.84,1.00)	1	1.08(1.00,1.17)	1.15(1.04,1.26)	0.01
Pooled-results						
red meat						
model 2	1.03 (0.97, 1.09)	0.99 (0.94, 1.05)	1	1.02 (0.96, 1.08)	1.20 (1.13, 1.27)	<.0001
processed meat						
model 2	1.16 (1.06, 1.28)	1.04 (0.98, 1.11)	1	1.18 (1.11, 1.24)	1.23 (1.13, 1.35)	0.004
unprocessed meat						
model 2	1.04 (0.97, 1.11)	0.97 (0.92, 1.02)	1	1.05 (1.00, 1.11)	1.14 (1.07, 1.22)	0.003

The exposure was change in red meat intake in 4-year period and the outcome was mortality in the subsequent 4 years.
CI: confidence interval; HPFS: Health Professionals Follow-up Study; HR: hazard ratio; NHS: Nurses' Health Study.

Model 2: Model 1+ race (white/nonwhite), initial consumption of red meat (in quintile), initial BMI (<23, 23−24.9, 25−29.9, 30−34.9, and ≥35 kg/m^2), family history of MI, diabetes or cancer, updated aspirin use, multivitamin use, menopause and HT status (only for women), and simultaneous changes in other lifestyle factors: smoking status (never to never, never to current, pasta to past, past to current, current to past, current to current or missing indicator) and initial and changes (all in quintiles) in physical activity, alcohol drink, and total energy intake, and other food groups, i.e., vegetables, fruits, whole grains, and sugar sweetened beverage.

Supplementary Table 4. Overall 12-Year HRs and 95% CIs for Mortality Risk According to Updated 12-Year Change in Total Red Meat Intake in NHS (1986-2010) and HPFS (1986-2010)

	Changes in frequency of red meat consumption (categories in servings per day)					
	decrease		no change (reference)	increase		p for trend
	>0.5	0.15-0.5	± 0.14	0.15-0.5	>0.5	
NHS (N=46,264)						
red meat						
cases/person-years	2081/184753	1386/133032	1226/114973	578/61682	317/31370	
model 2	0.97(0.88,1.06)	0.96(0.89,1.04)	1	0.94(0.85,1.04)	1.05(0.92,1.19)	0.54
processed meat						
cases/person-years	511/43886	1366/131447	3356/319460	296/26245	59/4773	
model 2	1.02(0.89,1.18)	1.00(0.91,1.09)	1	1.07(0.95,1.21)	1.22(0.94,1.58)	0.32
unprocessed meat						
cases/person-years	1410/123049	1475/136072	1657/157640	731/78698	315/30352	
model 2	1.01(0.92,1.12)	1.03(0.95,1.11)	1	1.00(0.91,1.09)	1.12(0.99,1.26)	0.53
HPFS (N= 26,393)						
red meat						
cases/person-years	1222/85823	842/61164	902/64896	668/43623	680/36881	
model 2	0.99(0.89,1.10)	0.98(0.89,1.09)	1	1.09(0.98,1.21)	1.19(1.06,1.32)	0.001
processed meat						
cases/person-years	439/27994	818/61227	2235/163248	595/29564	227/10354	
model 2	1.02(0.88,1.17)	0.97(0.87,1.07)	1	1.13(1.02,1.24)	1.16(1.00,1.34)	0.02
unprocessed meat						
cases/person-years	895/60395	895/63263	1252/87013	761/51638	511/30077	
model 2	0.96(0.85,1.07)	0.99(0.90,1.09)	1	1.04(0.95,1.15)	1.08(0.96,1.21)	0.05
Pooled-results						
red meat						
model 2	0.98 (0.91, 1.05)	0.97 (0.91, 1.03)	1	1.01 (0.94, 1.08)	1.12 (1.03, 1.22)	0.004
processed meat						
model 2	1.02 (0.92, 1.13)	0.98 (0.92, 1.05)	1	1.10 (1.02, 1.19)	1.17 (1.03, 1.33)	0.01
unprocessed meat						
model 2	0.99 (0.92, 1.06)	1.01 (0.95, 1.07)	1	1.02 (0.96, 1.09)	1.10 (1.01, 1.19)	0.07

The exposure was change in red meat intake in 12-year period and the outcome was mortality in the subsequent 12 years.
CI: confidence interval; HPFS: Health Professionals Follow-up Study; HR: hazard ratio; NHS: Nurses' Health Study.

Model 2: Model 1+ race (white/nonwhite), initial consumption of red meat (in quintile), initial BMI (<23, 23−24.9, 25−29.9, 30−34.9, and ≥35 kg/m^2), family history of MI, diabetes or cancer, updated aspirin use, multivitamin use, menopause and HT status (premenopausal, postmenopausal and hormone therapy never user, postmenopausal and hormone therapy current user, postmenopausal and hormone therapy past user, or missing indicator) (only for women), and simultaneous changes in other lifestyle factors: smoking status (never to never, never to current, pasta to past, past to current, current to past, current to current or missing indicator) and initial and changes (all in quintiles) in physical activity, alcohol drink, and total energy intake, and other food groups, i.e., vegetables, fruits, whole grains, and sugar sweetened beverage.

Supplementary Table 5. HRs and 95% CIs for 8-year all-cause mortality associated with one serving/day increased consumption of food groups during an 8-year course in the individual cohorts of NHS, HPFS and pooled findings

	Red meat*	Nuts	Poultry without skin	Fish	Dairy	Eggs	Legumes	Whole grains**	Vegetables without legumes***
NHS									
Model 1 (Red Meat)	1.09(1.04,1.14)	0.86(0.82,0.90)	0.90(0.80,1.01)	0.91(0.84,0.99)	1.00(0.98,1.01)	1.02(0.94,1.12)	1.03(0.96,1.11)	0.94(0.91,0.96)	0.96(0.94,0.97)
Model 2 (Processed Meat)	1.26(1.15,1.38)	0.86(0.82,0.90)	0.91(0.81,1.03)	0.91(0.84,0.99)	1.00(0.98,1.01)	1.01(0.93,1.11)	1.03(0.96,1.11)	0.94(0.91,0.96)	0.96(0.95,0.98)
Model 3 (Unprocessed Meat)	1.05(0.99,1.12)	0.86(0.81,0.90)	0.89(0.79,1.00)	0.91(0.84,0.99)	1.00(0.98,1.01)	1.04(0.95,1.13)	1.03(0.96,1.11)	0.93(0.91,0.95)	0.96(0.94,0.98)
HPFS									
Model 1 (Red Meat)	1.07(1.03,1.12)	0.90(0.86,0.94)	1.05(0.92,1.18)	0.89(0.8,0.98)	1.00(0.98,1.02)	0.97(0.95,0.99)	1.01(0.94,1.09)	0.97(0.94,0.99)	0.99(0.97,1.00)
Model 2 (Processed Meat)	1.13(1.05,1.22)	0.90(0.86,0.94)	1.05(0.93,1.19)	0.88(0.8,0.98)	1.00(0.98,1.02)	0.97(0.95,0.99)	1.01(0.94,1.10)	0.97(0.94,0.99)	0.99(0.97,1.00)
Model 3 (Unprocessed Meat)	1.07(1.01,1.14)	0.90(0.86,0.94)	1.04(0.91,1.17)	0.88(0.8,0.97)	1.00(0.98,1.02)	0.97(0.95,0.99)	1.01(0.94,1.09)	0.97(0.94,0.99)	0.99(0.97,1.00)
Pooled									
Model 1 (Red Meat)	1.08(1.05,1.12)	0.88(0.85,0.91)	0.97(0.89,1.05)	0.90(0.85,0.96)	1.00(0.99,1.01)	0.97(0.95,0.99)	1.02(0.97,1.08)	0.95(0.93,0.97)	0.97(0.96,0.98)
Model 2 (Processed Meat)	1.18(1.11,1.25)	0.88(0.85,0.91)	0.97(0.89,1.06)	0.90(0.85,0.96)	1.00(0.99,1.01)	0.97(0.95,0.99)	1.02(0.97,1.08)	0.95(0.93,0.97)	0.97(0.96,0.98)
Model 3 (Unprocessed Meat)	1.06(1.02,1.11)	0.88(0.85,0.91)	0.96(0.88,1.04)	0.90(0.84,0.96)	1.00(0.99,1.01)	0.98(0.96,1.00)	1.02(0.97,1.08)	0.95(0.93,0.96)	0.97(0.96,0.98)

CI: confidence interval; HPFS: Health Professionals Follow-up Study; HR: hazard ratio; NHS: Nurses' Health Study.

Model: Cox proportional hazards models including all food groups (red meat, nuts, poultry without skin, fish, dairy, eggs, legumes, whole grains, and vegetables excluding legumes) simultaneously (initial and change, both continuous, per serving), adjusted for age, race (white, nonwhite), BMI groups in 1986 (kg/m^2, <21, 21-22, 23-24, 25-29, 30+), family history of MI, diabetes and cancer, updated aspirin use, women menopausal status and use of postmenopausal hormones ((premenopausal, postmenopausal and hormone therapy never user, postmenopausal and hormone therapy current user, postmenopausal and hormone therapy past user, or missing indicator)) (only for women), and simultaneous changes in other lifestyle factors: smoking status (never to never, never to current, pasta to past, past to current, current to past, current to current or missing indicator) and initial and changes (all in quintiles) in physical activity, alcohol drink, total energy intake, and other food groups, i.e., fruits, and sugar sweetened beverage.

The results across the two cohorts were pooled using an inverse variance weighted, fixed-effect meta-analysis.
* Red meat indicates all red meat in Model 1, processed meat in Model 2, and unprocessed meat in Model 3.
**Whole grains included whole grain cold breakfast cereal, dark bread, oatmeal, brown rice, popcorn, bran, and germ;
*** vegetables included green leafy vegetables (such as spinach, kale and lettuces) and cruciferous vegetables (such as cabbage, cauliflower, brussels sprouts and broccoli) without legumes in the current substitution analysis.

Supplementary Table 6. HRs and 95% CIs for 4-year all-cause mortality associated with one serving/day decreased intake of red meat and concomitant increased intake of another major dietary protein source, whole grain, or vegetables during a 4-year course in the individual cohorts of NHS, HPFS and pooled findings

	Nuts	**Poultry (no skin)**	**Fish**	**Dairy**	**Eggs**	**Legumes**	**Whole grains***	**Vegetables without legumes****
NHS								
Red Meat	0.84(0.79,0.88)	0.77(0.72,0.82)	0.90(0.78,1.03)	0.97(0.86,1.09)	1.09(1.04,1.14)	0.96(0.87,1.07)	0.89(0.81,0.98)	0.90(0.86,0.95)
Processed Meat	0.76(0.69,0.85)	0.71(0.64,0.78)	0.81(0.70,0.94)	0.88(0.77,1.01)	0.99(0.91,1.07)	0.88(0.77,1.00)	0.81(0.72,0.91)	0.82(0.76,0.90)
Unprocessed Meat	0.84(0.79,0.90)	0.77(0.72,0.83)	0.90(0.78,1.03)	0.98(0.86,1.10)	1.11(1.05,1.18)	0.97(0.87,1.09)	0.90(0.81,0.99)	0.91(0.86,0.97)
HPFS								
Red Meat	0.84(0.80,0.87)	0.96(0.90,1.01)	0.88(0.77,1.01)	0.97(0.88,1.07)	0.97(0.93,1.01)	0.97(0.93,1.01)	0.92(0.85,1.00)	0.94(0.90,0.98)
Processed Meat	0.81(0.75,0.87)	0.93(0.86,1.00)	0.85(0.74,0.98)	0.94(0.84,1.05)	0.94(0.87,1.00)	0.94(0.87,1.01)	0.89(0.81,0.98)	0.91(0.85,0.97)
Unprocessed Meat	0.84(0.79,0.89)	0.95(0.90,1.02)	0.88(0.77,1.01)	0.97(0.87,1.08)	0.97(0.92,1.02)	0.97(0.92,1.02)	0.92(0.84,1.00)	0.94(0.89,0.99)
Pooled								
Red Meat	0.84(0.81,0.87)	0.87(0.84,0.91)	0.89(0.81,0.98)	0.97(0.90,1.04)	1.02(0.99,1.05)	0.97(0.93,1.01)	0.91(0.85,0.96)	0.92(0.89,0.95)
Processed Meat	0.79(0.75,0.84)	0.83(0.78,0.89)	0.83(0.75,0.92)	0.91(0.84,1.00)	0.96(0.91,1.01)	0.93(0.87,0.98)	0.86(0.79,0.92)	0.87(0.83,0.92)
Unprocessed Meat	0.84(0.81,0.88)	0.87(0.83,0.91)	0.89(0.81,0.98)	0.97(0.90,1.05)	1.03(0.99,1.07)	0.97(0.93,1.02)	0.91(0.85,0.97)	0.93(0.89,0.96)

CI: confidence interval; HPFS: Health Professionals Follow-up Study; HR: hazard ratio; NHS: Nurses' Health Study.

Model: Cox proportional hazards models including all food groups (red meat, nuts, poultry without skin, fish, dairy, eggs, legumes, whole grains, and vegetables excluding legumes) simultaneously (initial and change, both continuous, per serving), adjusted for age, race (white, nonwhite), BMI groups in 1986 (kg/m^2, <21, 21-22, 23-24, 25-29, 30+), family history of MI, diabetes and cancer, updated aspirin use, multivitamin use; women menopausal status and use of postmenopausal hormones (premenopausal, postmenopausal and hormone therapy never user, postmenopausal and hormone therapy current user, postmenopausal and hormone therapy past user, or missing indicator) (only for women), and simultaneous changes in other lifestyle factors: smoking status (never to never, never to current, pasta to past, past to current, current to past, current to current or missing indicator) and initial and changes (all in quintiles) in physical activity, alcohol drink, total energy intake, and other food groups, i.e., fruits, and sugar sweetened beverage.

The results across the two cohorts were pooled using an inverse variance weighted, fixed-effect meta-analysis.
*Whole grains included whole grain cold breakfast cereal, dark bread, oatmeal, brown rice, popcorn, bran, and germ;
** vegetables included green leafy vegetables (such as spinach, kale and lettuces) and cruciferous vegetables (such as cabbage, cauliflower, brussels sprouts and broccoli) without legumes in the current substitution analysis.

Supplementary Table 7. HRs and 95% CIs for 12-year all-cause mortality associated with one serving/day decreased intake of red meat and concomitant increased intake of another major dietary protein source, whole grain, or vegetables during a 12-year course in the individual cohorts of NHS, HPFS and pooled findings

	Nuts	Poultry (no skin)	Fish	Dairy	Eggs	Legumes	Whole grains*	Vegetables without legumes**
NHS								
Red Meat	0.83(0.79,0.88)	0.72(0.63,0.82)	0.82(0.69,0.97)	0.97(0.82,1.13)	1.08(1.00,1.16)	1.06(0.92,1.22)	0.91(0.80,1.03)	0.93(0.87,1.00)
Processed Meat	0.79(0.72,0.87)	0.69(0.57,0.84)	0.78(0.63,0.97)	0.92(0.74,1.14)	1.02(0.87,1.20)	1.01(0.81,1.26)	0.86(0.71,1.04)	0.89(0.76,1.05)
Unprocessed Meat	0.83(0.78,0.89)	0.72(0.62,0.83)	0.82(0.68,0.97)	0.97(0.82,1.14)	1.09(1.00,1.19)	1.06(0.91,1.23)	0.90(0.79,1.04)	0.93(0.86,1.02)
HPFS								
Red Meat	0.86(0.81,0.90)	0.88(0.81,0.95)	0.81(0.68,0.96)	0.96(0.85,1.10)	1.07(1.00,1.14)	0.94(0.84,1.06)	0.91(0.82,1.01)	0.96(0.90,1.02)
Processed Meat	0.82(0.76,0.88)	0.85(0.76,0.95)	0.77(0.64,0.92)	0.92(0.79,1.07)	1.01(0.91,1.13)	0.90(0.78,1.05)	0.87(0.76,0.99)	0.91(0.82,1.01)
Unprocessed Meat	0.86(0.8,0.92)	0.88(0.80,0.97)	0.80(0.66,0.96)	0.97(0.84,1.11)	1.09(1.00,1.19)	0.95(0.83,1.08)	0.91(0.81,1.03)	0.96(0.88,1.04)
Meta-analysis								
Red Meat	0.84(0.81,0.88)	0.84(0.78,0.90)	0.81(0.72,0.92)	0.96(0.87,1.07)	1.07(1.02,1.13)	0.99(0.90,1.08)	0.91(0.84,0.98)	0.95(0.90,0.99)
Processed Meat	0.80(0.76,0.86)	0.81(0.73,0.89)	0.77(0.67,0.89)	0.92(0.81,1.04)	1.02(0.93,1.11)	0.94(0.83,1.06)	0.87(0.78,0.96)	0.90(0.83,0.99)
Unprocessed Meat	0.80(0.80,0.88)	0.82(0.76,0.89)	0.81(0.71,0.92)	0.97(0.87,1.08)	1.09(1.03,1.16)	0.99(0.90,1.09)	0.91(0.83,0.99)	0.95(0.89,1.01)

CI: confidence interval; HPFS: Health Professionals Follow-up Study; HR: hazard ratio; NHS: Nurses' Health Study.

Model: Cox proportional hazards models including all food groups (red meat, nuts, poultry without skin, fish, dairy, eggs, legumes, whole grains, and vegetables excluding legumes) simultaneously (initial and change, both continuous, per serving), adjusted for age, race (white, nonwhite), BMI groups in 1986 (kg/m^2, <21, 21-22, 23-24, 25-29, 30+), family history of MI, diabetes and cancer, updated aspirin use, multivitamin use; women menopausal status and use of postmenopausal hormones (premenopausal, postmenopausal and hormone therapy never user, postmenopausal and hormone therapy current user, postmenopausal and hormone therapy past user, or missing indicator) (only for women), and

simultaneous changes in other lifestyle factors: smoking status (never to never, never to current, pasta to past, past to current, current to past, current to current or missing indicator) and initial and changes (all in quintiles) in physical activity, alcohol drink, total energy intake, and other food groups, i.e., fruits, and sugar sweetened beverage.

The results across the two cohorts were pooled using an inverse variance weighted, fixed-effect meta-analysis.
*Whole grains included whole grain cold breakfast cereal, dark bread, oatmeal, brown rice, popcorn, bran, and germ;
** vegetables included green leafy vegetables (such as spinach, kale and lettuces) and cruciferous vegetables (such as cabbage, cauliflower, brussels sprouts and broccoli) without legumes in the current substitution analysis.