

Supplementary Table A. HR's and 95% CI for association between meat intake and mortality in the NIH-AARP Diet and Health Study using substitution models*

	Q2	Q3	Q4	Q5	P for trend**	Per 20 g increase
All red meat						
Overall	1.06 (1.04,1.08)	1.12 (1.10,1.14)	1.18 (1.16,1.20)	1.26 (1.23,1.29)	P<0.0001	1.09 (1.08,1.10)
Cancer	1.02 (0.99,1.05)	1.08 (1.05,1.12)	1.14 (1.10,1.18)	1.18 (1.14,1.23)	P<0.0001	1.07 (1.06,1.09)
Heart disease	1.07 (1.03,1.11)	1.12 (1.08,1.16)	1.18 (1.13,1.22)	1.27 (1.22,1.33)	P<0.0001	1.08 (1.07,1.10)
Respiratory diseases	1.25 (1.16,1.34)	1.47 (1.36,1.57)	1.54 (1.43,1.66)	1.83 (1.68,2.00)	P<0.0001	1.22 (1.19,1.25)
Stroke	1.04 (0.95,1.13)	1.11 (1.02,1.21)	1.21 (1.11,1.33)	1.17 (1.05,1.30)	P<0.0001	1.06 (1.02,1.10)
Diabetes	1.11 (0.98,1.25)	1.22 (1.08,1.37)	1.35 (1.19,1.52)	1.44 (1.26,1.64)	P<0.0001	1.12 (1.08,1.16)
Infections	1.06 (0.93,1.21)	1.08 (0.94,1.23)	1.23 (1.08,1.42)	1.24 (1.06,1.45)	P<0.005	1.09 (1.04,1.14)
Alzheimer's disease	0.86 (0.76,0.98)	0.87 (0.76,1.00)	0.85 (0.73,0.99)	0.98 (0.82,1.16)	P=0.8	1.00 (0.95,1.07)
Kidney disease	1.06 (0.90,1.24)	1.23 (1.05,1.44)	1.29 (1.09,1.52)	1.47 (1.22,1.77)	P<0.0001	1.15 (1.09,1.22)
Liver disease	1.08 (0.86,1.34)	1.53 (1.23,1.90)	1.63 (1.30,2.05)	2.30 (1.78,2.99)	P<0.0001	1.47 (1.35,1.60)
Others/unknown	1.06 (1.01,1.11)	1.07 (1.02,1.12)	1.12 (1.07,1.18)	1.21 (1.14,1.28)	P<0.0001	1.06 (1.05,1.08)
Processed red meat						
Overall	1.00 (0.98,1.02)	1.05 (1.03,1.07)	1.09 (1.07,1.11)	1.15 (1.13,1.17)	P<0.0001	1.10 (1.08,1.11)
Cancer	1.01 (0.98,1.05)	1.06 (1.03,1.09)	1.08 (1.05,1.12)	1.13 (1.09,1.17)	P<0.0001	1.08 (1.06,1.11)
Heart disease	0.97 (0.93,1.01)	1.02 (0.99,1.06)	1.09 (1.05,1.13)	1.11 (1.07,1.16)	P<0.0001	1.08 (1.05,1.10)
Respiratory diseases	1.12 (1.04,1.20)	1.28 (1.20,1.38)	1.34 (1.25,1.43)	1.45 (1.35,1.56)	P<0.0001	1.20 (1.15,1.25)
Stroke	0.91 (0.83,0.99)	0.96 (0.88,1.05)	0.98 (0.90,1.07)	1.04 (0.95,1.14)	P<0.05	1.08 (1.01,1.15)
Diabetes	1.02 (0.91,1.15)	1.09 (0.97,1.23)	1.19 (1.06,1.33)	1.28 (1.14,1.44)	P<0.0001	1.12 (1.05,1.19)
Infections	0.97 (0.85,1.10)	1.08 (0.95,1.23)	1.06 (0.93,1.21)	1.13 (0.98,1.29)	P<0.05	1.07 (0.98,1.17)
Alzheimer's disease	0.89 (0.78,1.02)	0.94 (0.82,1.08)	0.83 (0.72,0.96)	1.00 (0.86,1.16)	P=0.7	1.09 (0.98,1.22)
Kidney disease	1.12 (0.96,1.31)	1.11 (0.95,1.31)	1.18 (1.01,1.39)	1.37 (1.16,1.60)	P<0.0001	1.19 (1.09,1.31)
Liver disease	1.27 (1.03,1.56)	1.14 (0.92,1.42)	1.43 (1.16,1.76)	1.47 (1.18,1.84)	P<0.001	1.22 (1.07,1.39)
Others/unknown	1.01 (0.96,1.05)	1.00 (0.96,1.05)	1.06 (1.01,1.11)	1.13 (1.08,1.19)	P<0.0001	1.09 (1.06,1.13)
Unprocessed red meat						
Overall	1.05 (1.03,1.07)	1.09 (1.07,1.11)	1.13 (1.11,1.15)	1.20 (1.17,1.22)	P<0.0001	1.08 (1.07,1.09)
Cancer	1.02 (0.99,1.06)	1.07 (1.04,1.10)	1.11 (1.08,1.15)	1.13 (1.09,1.17)	P<0.0001	1.06 (1.05,1.08)
Heart disease	1.04 (1.01,1.08)	1.09 (1.05,1.13)	1.12 (1.07,1.16)	1.21 (1.16,1.26)	P<0.0001	1.08 (1.07,1.10)
Respiratory diseases	1.24 (1.16,1.33)	1.32 (1.23,1.42)	1.44 (1.34,1.54)	1.60 (1.48,1.74)	P<0.0001	1.18 (1.15,1.22)
Stroke	1.13 (1.04,1.22)	1.15 (1.06,1.26)	1.20 (1.10,1.32)	1.16 (1.05,1.28)	P<0.01	1.05 (1.01,1.09)
Diabetes	1.04 (0.93,1.17)	1.17 (1.04,1.31)	1.20 (1.07,1.35)	1.33 (1.18,1.51)	P<0.0001	1.10 (1.06,1.15)
Infections	1.10 (0.97,1.25)	1.04 (0.92,1.19)	1.14 (1.00,1.31)	1.25 (1.08,1.45)	P<0.005	1.09 (1.03,1.15)
Alzheimer's disease	0.88 (0.78,1.00)	0.83 (0.72,0.95)	0.86 (0.74,0.99)	0.88 (0.74,1.04)	P=0.2	0.97 (0.91,1.04)
Kidney disease	1.00 (0.86,1.16)	1.09 (0.94,1.27)	1.12 (0.96,1.31)	1.23 (1.03,1.46)	P<0.01	1.11 (1.04,1.18)
Liver disease	1.12 (0.91,1.39)	1.36 (1.10,1.68)	1.66 (1.33,2.06)	2.14 (1.68,2.72)	P<0.0001	1.45 (1.33,1.58)
Others/unknown	1.01 (0.97,1.06)	1.03 (0.98,1.08)	1.07 (1.02,1.12)	1.13 (1.07,1.19)	P<0.0001	1.05 (1.03,1.07)
All white meat						
Overall	0.92 (0.90,0.93)	0.87 (0.85,0.88)	0.83 (0.81,0.85)	0.75 (0.74,0.77)	P<0.0001	0.92 (0.91,0.93)
Cancer	0.91 (0.88,0.93)	0.88 (0.85,0.91)	0.86 (0.83,0.89)	0.78 (0.75,0.81)	P<0.0001	0.93 (0.92,0.94)
Heart disease	0.93 (0.90,0.96)	0.90 (0.87,0.93)	0.84 (0.81,0.87)	0.78 (0.75,0.82)	P<0.0001	0.92 (0.91,0.94)
Respiratory diseases	0.89 (0.84,0.94)	0.79 (0.75,0.84)	0.70 (0.65,0.75)	0.55 (0.50,0.60)	P<0.0001	0.82 (0.80,0.84)
Stroke	0.97 (0.90,1.05)	0.86 (0.79,0.94)	0.82 (0.75,0.90)	0.87 (0.77,0.97)	P<0.005	0.94 (0.91,0.98)
Diabetes	0.93 (0.84,1.03)	0.86 (0.77,0.96)	0.84 (0.75,0.94)	0.69 (0.60,0.79)	P<0.0001	0.89 (0.86,0.93)
Infections	0.96 (0.85,1.07)	0.86 (0.76,0.97)	0.89 (0.78,1.02)	0.76 (0.65,0.90)	P<0.005	0.92 (0.88,0.97)
Alzheimer's disease	0.97 (0.85,1.10)	0.92 (0.80,1.05)	0.84 (0.72,0.98)	0.93 (0.77,1.12)	P=0.3	1.00 (0.94,1.06)
Kidney disease	0.87 (0.76,1.00)	0.86 (0.74,0.99)	0.79 (0.68,0.92)	0.65 (0.54,0.79)	P<0.0001	0.87 (0.82,0.92)
Liver disease	0.83 (0.71,0.98)	0.55 (0.46,0.67)	0.53 (0.44,0.65)	0.32 (0.24,0.42)	P<0.0001	0.68 (0.63,0.74)
Others/unknown	0.91 (0.87,0.95)	0.87 (0.84,0.91)	0.84 (0.80,0.89)	0.80 (0.75,0.84)	P<0.0001	0.94 (0.92,0.96)

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Supplementary Table A- continued. HR's and 95% CI for association between meat intake and mortality in the NIH-AARP Diet and Health Study using substitution models*

	Q2	Q3	Q4	Q5	P for trend**	Per 20 g increase
Processed white meat						
Overall	0.95 (0.93,0.96)	0.95 (0.94,0.97)	0.95 (0.93,0.96)	0.95 (0.93,0.96)	P<0.0001	0.95 (0.93,0.97)
Cancer	0.95 (0.92,0.98)	0.95 (0.93,0.98)	0.94 (0.91,0.96)	0.92 (0.90,0.95)	P<0.0001	0.92 (0.89,0.96)
Heart disease	0.95 (0.91,0.98)	0.96 (0.93,0.99)	0.96 (0.93,0.99)	0.97 (0.94,1.00)	P=0.3	0.96 (0.92,1.00)
Respiratory diseases	0.94 (0.88,1.00)	0.92 (0.87,0.97)	0.94 (0.88,0.99)	0.89 (0.84,0.94)	P<0.005	0.89 (0.82,0.97)
Stroke	0.96 (0.88,1.05)	1.03 (0.95,1.10)	0.91 (0.84,0.98)	1.04 (0.96,1.12)	P=0.3	1.08 (0.98,1.19)
Diabetes	0.96 (0.85,1.08)	0.97 (0.88,1.07)	1.02 (0.93,1.12)	1.00 (0.91,1.10)	P=0.8	0.95 (0.85,1.06)
Infections	0.91 (0.80,1.04)	0.97 (0.87,1.09)	1.02 (0.91,1.13)	0.89 (0.80,1.00)	P=0.1	0.93 (0.80,1.09)
Alzheimer's disease	0.86 (0.73,1.00)	0.87 (0.77,0.99)	0.99 (0.87,1.12)	1.17 (1.03,1.33)	P<0.0001	1.31 (1.12,1.52)
Kidney disease	0.92 (0.79,1.08)	0.97 (0.85,1.10)	0.91 (0.79,1.03)	0.96 (0.84,1.09)	P=0.7	0.93 (0.79,1.11)
Liver disease	0.94 (0.78,1.13)	0.86 (0.73,1.02)	0.77 (0.64,0.91)	0.71 (0.59,0.86)	P<0.0001	0.52 (0.37,0.72)
Others/unknown	0.95 (0.91,1.00)	0.93 (0.90,0.97)	0.95 (0.91,0.98)	0.96 (0.93,1.00)	P=0.4	0.98 (0.93,1.04)
Unprocessed white meat						
Overall	0.92 (0.91,0.94)	0.88 (0.86,0.90)	0.84 (0.82,0.85)	0.76 (0.74,0.78)	P<0.0001	0.92 (0.91,0.93)
Cancer	0.92 (0.89,0.95)	0.90 (0.87,0.92)	0.87 (0.84,0.89)	0.80 (0.77,0.83)	P<0.0001	0.94 (0.92,0.95)
Heart disease	0.92 (0.89,0.96)	0.89 (0.86,0.92)	0.86 (0.83,0.89)	0.78 (0.74,0.81)	P<0.0001	0.92 (0.91,0.94)
Respiratory diseases	0.89 (0.84,0.94)	0.82 (0.77,0.87)	0.70 (0.66,0.75)	0.57 (0.52,0.62)	P<0.0001	0.82 (0.80,0.84)
Stroke	0.98 (0.90,1.06)	0.84 (0.77,0.91)	0.80 (0.73,0.88)	0.80 (0.71,0.89)	P<0.0001	0.93 (0.90,0.97)
Diabetes	0.96 (0.86,1.06)	0.89 (0.80,0.99)	0.85 (0.76,0.94)	0.72 (0.63,0.82)	P<0.0001	0.89 (0.86,0.93)
Infections	0.97 (0.86,1.09)	0.89 (0.79,1.01)	0.91 (0.80,1.04)	0.80 (0.68,0.94)	P<0.01	0.92 (0.88,0.97)
Alzheimer's disease	0.87 (0.77,0.99)	0.87 (0.76,1.00)	0.75 (0.64,0.87)	0.78 (0.65,0.94)	P<0.01	0.96 (0.90,1.02)
Kidney disease	0.86 (0.75,0.99)	0.84 (0.73,0.97)	0.79 (0.68,0.93)	0.66 (0.54,0.79)	P<0.0001	0.87 (0.82,0.92)
Liver disease	0.84 (0.71,0.99)	0.59 (0.49,0.71)	0.56 (0.46,0.69)	0.37 (0.29,0.48)	P<0.0001	0.70 (0.64,0.76)
Others/unknown	0.92 (0.88,0.96)	0.88 (0.84,0.92)	0.84 (0.80,0.88)	0.79 (0.75,0.84)	P<0.0001	0.94 (0.92,0.96)
All processed meat						
Overall	1.02 (1.00,1.04)	1.05 (1.03,1.07)	1.10 (1.08,1.12)	1.12 (1.09,1.14)	P<0.0001	1.06 (1.05,1.08)
Cancer	1.01 (0.98,1.04)	1.04 (1.00,1.07)	1.07 (1.04,1.10)	1.08 (1.05,1.12)	P<0.0001	1.05 (1.03,1.07)
Heart disease	1.00 (0.97,1.04)	1.04 (1.00,1.08)	1.08 (1.04,1.12)	1.10 (1.06,1.14)	P<0.0001	1.05 (1.03,1.07)
Respiratory diseases	1.16 (1.09,1.25)	1.31 (1.22,1.40)	1.33 (1.24,1.43)	1.38 (1.28,1.48)	P<0.0001	1.14 (1.10,1.18)
Stroke	1.01 (0.93,1.10)	1.01 (0.92,1.10)	1.10 (1.01,1.20)	1.09 (1.00,1.20)	P<0.05	1.09 (1.03,1.15)
Diabetes	1.10 (0.97,1.24)	1.14 (1.01,1.29)	1.26 (1.12,1.42)	1.28 (1.14,1.44)	P<0.0001	1.08 (1.02,1.15)
Infections	1.07 (0.94,1.21)	1.05 (0.92,1.19)	1.17 (1.02,1.33)	1.08 (0.94,1.24)	P=0.3	1.04 (0.97,1.13)
Alzheimer's disease	0.98 (0.86,1.12)	0.90 (0.78,1.04)	0.98 (0.85,1.14)	1.10 (0.95,1.28)	P=0.07	1.17 (1.07,1.29)
Kidney disease	1.02 (0.87,1.19)	1.08 (0.92,1.26)	1.11 (0.94,1.30)	1.26 (1.08,1.48)	P<0.0001	1.13 (1.04,1.23)
Liver disease	1.04 (0.85,1.27)	1.07 (0.87,1.31)	1.08 (0.88,1.32)	1.08 (0.87,1.34)	P=0.6	1.04 (0.92,1.17)
Others/unknown	1.00 (0.96,1.05)	0.99 (0.95,1.04)	1.07 (1.02,1.12)	1.10 (1.04,1.15)	P<0.0001	1.06 (1.03,1.09)

* All HR's are versus the first quintile of intake as the reference category. Models are adjusted for sex, age at entry to study, marital status, ethnicity, education, quintiles of a composite deprivation index, perceived health at baseline, history of heart disease, stroke, diabetes and cancer at baseline, smoking history, body mass index, vigorous physical activity, usual activity throughout the day, alcohol consumption, fruit and vegetable intakes, total energy intake, and total meat intake.

** Using the median for each quintile.

HR: hazard ratio; CI: confidence interval

Supplementary Table B. HR's and 95% CI for association between meat intake and mortality in the NIH-AARP Diet and Health Study using addition models*

	Q2	Q3	Q4	Q5	P for trend**
All red meat					
Overall	1.04 (1.03,1.06)	1.1 (1.08,1.12)	1.15 (1.13,1.17)	1.20 (1.18,1.22)	P<0.0001
Cancer	1.01 (0.98,1.04)	1.06 (1.03,1.1)	1.10 (1.07,1.14)	1.12 (1.09,1.16)	P<0.0001
Heart disease	1.07 (1.03,1.11)	1.11 (1.08,1.16)	1.17 (1.13,1.22)	1.27 (1.22,1.31)	P<0.0001
Respiratory diseases	1.21 (1.12,1.29)	1.37 (1.28,1.47)	1.40 (1.30,1.50)	1.54 (1.44,1.66)	P<0.0001
Stroke	1.02 (0.94,1.11)	1.08 (0.99,1.18)	1.17 (1.07,1.27)	1.10 (1.00,1.20)	P<0.01
Diabetes	1.10 (0.98,1.24)	1.20 (1.07,1.36)	1.32 (1.18,1.49)	1.40 (1.24,1.57)	P<0.0001
Infections	1.05 (0.92,1.19)	1.05 (0.93,1.20)	1.19 (1.05,1.35)	1.16 (1.02,1.33)	P<0.01
Alzheimer's disease	0.85 (0.74,0.96)	0.84 (0.73,0.96)	0.81 (0.70,0.93)	0.89 (0.77,1.03)	P=0.2
Kidney disease	1.04 (0.88,1.21)	1.18 (1.01,1.38)	1.22 (1.04,1.42)	1.32 (1.13,1.55)	P<0.0001
Liver disease	1.01 (0.81,1.25)	1.36 (1.10,1.67)	1.37 (1.11,1.69)	1.70 (1.38,2.10)	P<0.0001
Others/unknown	1.05 (1.00,1.10)	1.05 (1.00,1.10)	1.09 (1.04,1.14)	1.15 (1.09,1.20)	P<0.0001
Processed red meat					
Overall	0.98 (0.96,1.00)	1.02 (1.00,1.04)	1.05 (1.03,1.07)	1.10 (1.08,1.12)	P<0.0001
Cancer	1.00 (0.97,1.03)	1.03 (1.00,1.06)	1.05 (1.01,1.08)	1.09 (1.05,1.12)	P<0.0001
Heart disease	0.95 (0.92,0.99)	0.99 (0.96,1.03)	1.05 (1.01,1.09)	1.08 (1.04,1.12)	P<0.0001
Respiratory diseases	1.07 (1.00,1.15)	1.20 (1.12,1.29)	1.23 (1.14,1.32)	1.31 (1.22,1.40)	P<0.0001
Stroke	0.89 (0.82,0.97)	0.93 (0.86,1.02)	0.94 (0.86,1.03)	1.00 (0.91,1.09)	P=0.2
Diabetes	1.00 (0.89,1.13)	1.06 (0.94,1.19)	1.13 (1.01,1.27)	1.23 (1.09,1.37)	P<0.0001
Infections	0.95 (0.83,1.08)	1.04 (0.92,1.19)	1.02 (0.89,1.16)	1.07 (0.94,1.22)	P=0.2
Alzheimer's disease	0.89 (0.78,1.02)	0.93 (0.81,1.07)	0.82 (0.71,0.95)	0.97 (0.84,1.13)	P=0.7
Kidney disease	1.09 (0.93,1.28)	1.07 (0.91,1.25)	1.12 (0.95,1.32)	1.27 (1.09,1.49)	P<0.001
Liver disease	1.16 (0.94,1.43)	1.00 (0.81,1.24)	1.20 (0.97,1.48)	1.20 (0.97,1.49)	P=0.1
Others/unknown	0.99 (0.95,1.04)	0.98 (0.94,1.03)	1.03 (0.98,1.08)	1.09 (1.04,1.15)	P<0.0001
Unprocessed red meat					
Overall	1.03 (1.01,1.05)	1.06 (1.04,1.08)	1.10 (1.08,1.12)	1.14 (1.12,1.16)	P<0.0001
Cancer	1.01 (0.98,1.04)	1.05 (1.01,1.08)	1.08 (1.05,1.11)	1.08 (1.05,1.12)	P<0.0001
Heart disease	1.04 (1.00,1.07)	1.08 (1.04,1.12)	1.10 (1.06,1.14)	1.20 (1.16,1.25)	P<0.0001
Respiratory diseases	1.19 (1.11,1.27)	1.24 (1.16,1.33)	1.32 (1.23,1.41)	1.40 (1.30,1.50)	P<0.0001
Stroke	1.11 (1.02,1.20)	1.13 (1.04,1.23)	1.16 (1.06,1.27)	1.10 (1.00,1.21)	P=0.08
Diabetes	1.02 (0.91,1.15)	1.14 (1.02,1.28)	1.17 (1.04,1.31)	1.28 (1.15,1.44)	P<0.0001
Infections	1.09 (0.96,1.23)	1.02 (0.89,1.16)	1.10 (0.96,1.25)	1.18 (1.03,1.34)	P<0.05
Alzheimer's disease	0.87 (0.76,0.98)	0.80 (0.70,0.92)	0.82 (0.71,0.94)	0.82 (0.70,0.95)	P<0.05
Kidney disease	0.97 (0.83,1.12)	1.04 (0.89,1.21)	1.06 (0.91,1.23)	1.13 (0.97,1.32)	P<0.05
Liver disease	1.05 (0.85,1.30)	1.22 (0.99,1.50)	1.41 (1.15,1.74)	1.66 (1.35,2.04)	P<0.0001
Others/unknown	1.00 (0.96,1.05)	1.00 (0.96,1.05)	1.03 (0.98,1.08)	1.08 (1.03,1.13)	P<0.0001
All white meat					
Overall	0.93 (0.92,0.95)	0.91 (0.89,0.92)	0.89 (0.88,0.91)	0.88 (0.86,0.90)	P<0.0001
Cancer	0.92 (0.90,0.95)	0.91 (0.88,0.93)	0.91 (0.88,0.94)	0.87 (0.85,0.90)	P<0.0001
Heart disease	0.95 (0.92,0.98)	0.94 (0.91,0.97)	0.91 (0.88,0.95)	0.94 (0.91,0.98)	P<0.001
Respiratory diseases	0.93 (0.88,0.98)	0.86 (0.81,0.91)	0.79 (0.75,0.85)	0.73 (0.68,0.78)	P<0.0001
Stroke	0.98 (0.91,1.06)	0.88 (0.81,0.95)	0.85 (0.78,0.92)	0.93 (0.86,1.01)	P<0.05
Diabetes	0.96 (0.87,1.07)	0.92 (0.83,1.02)	0.94 (0.85,1.04)	0.88 (0.79,0.97)	P<0.05
Infections	0.97 (0.87,1.09)	0.89 (0.79,1.00)	0.95 (0.84,1.07)	0.87 (0.77,0.98)	P<0.05
Alzheimer's disease	0.96 (0.84,1.09)	0.90 (0.79,1.03)	0.82 (0.71,0.94)	0.88 (0.77,1.01)	P<0.05
Kidney disease	0.89 (0.78,1.02)	0.91 (0.79,1.04)	0.87 (0.75,1.00)	0.80 (0.69,0.93)	P<0.01
Liver disease	0.89 (0.76,1.04)	0.63 (0.53,0.76)	0.68 (0.56,0.82)	0.53 (0.43,0.66)	P<0.0001
Others/unknown	0.92 (0.89,0.96)	0.90 (0.86,0.94)	0.89 (0.85,0.93)	0.89 (0.85,0.93)	P<0.0001

Table continues on the next page.

Supplementary Table B-continued. HR's and 95% CI for association between meat intake and mortality in the NIH-AARP Diet and Health Study using addition models*

	Q2	Q3	Q4	Q5	P for trend**
Processed white meat					
Overall	0.95 (0.94,0.97)	0.96 (0.94,0.97)	0.96 (0.95,0.98)	0.96 (0.95,0.98)	P<0.05
Cancer	0.96 (0.93,0.99)	0.96 (0.94,0.99)	0.95 (0.92,0.97)	0.94 (0.91,0.96)	P<0.0001
Heart disease	0.95 (0.92,0.99)	0.98 (0.95,1.01)	0.97 (0.94,1.00)	0.99 (0.96,1.02)	P=0.7
Respiratory diseases	0.94 (0.89,1.01)	0.93 (0.88,0.98)	0.97 (0.92,1.03)	0.94 (0.88,1.00)	P=0.2
Stroke	0.96 (0.88,1.05)	1.00 (0.92,1.07)	0.97 (0.90,1.05)	1.02 (0.95,1.10)	P=0.3
Diabetes	0.99 (0.88,1.11)	0.99 (0.89,1.09)	1.05 (0.96,1.16)	1.02 (0.93,1.12)	P=0.6
Infections	0.94 (0.83,1.07)	0.96 (0.86,1.07)	1.02 (0.92,1.14)	0.92 (0.82,1.03)	P=0.2
Alzheimer's disease	0.92 (0.79,1.06)	0.89 (0.78,1.01)	0.94 (0.83,1.07)	1.13 (1.00,1.28)	P<0.001
Kidney disease	0.95 (0.81,1.11)	0.98 (0.86,1.11)	0.95 (0.83,1.08)	0.94 (0.83,1.08)	P=0.5
Liver disease	0.97 (0.80,1.17)	0.85 (0.72,1.01)	0.85 (0.71,1.01)	0.77 (0.64,0.93)	P<0.01
Others/unknown	0.96 (0.91,1.00)	0.94 (0.90,0.98)	0.95 (0.91,0.99)	0.98 (0.94,1.02)	P<0.05
Unprocessed white meat					
Overall	0.93 (0.92,0.95)	0.91 (0.89,0.92)	0.89 (0.88,0.91)	0.88 (0.86,0.89)	P<0.0001
Cancer	0.93 (0.91,0.96)	0.92 (0.90,0.95)	0.91 (0.88,0.94)	0.89 (0.86,0.92)	P<0.0001
Heart disease	0.94 (0.91,0.97)	0.93 (0.90,0.96)	0.93 (0.90,0.96)	0.93 (0.90,0.96)	P<0.0001
Respiratory diseases	0.91 (0.86,0.96)	0.87 (0.82,0.92)	0.79 (0.74,0.84)	0.73 (0.68,0.78)	P<0.0001
Stroke	0.97 (0.90,1.05)	0.86 (0.79,0.93)	0.84 (0.78,0.92)	0.88 (0.81,0.96)	P<0.0001
Diabetes	0.95 (0.86,1.05)	0.95 (0.86,1.05)	0.93 (0.84,1.03)	0.88 (0.80,0.98)	P<0.05
Infections	0.98 (0.87,1.10)	0.90 (0.80,1.02)	0.96 (0.85,1.08)	0.88 (0.77,1.00)	P=0.06
Alzheimer's disease	0.90 (0.79,1.02)	0.87 (0.76,0.99)	0.76 (0.66,0.87)	0.79 (0.69,0.91)	P<0.001
Kidney disease	0.83 (0.72,0.95)	0.85 (0.74,0.98)	0.85 (0.74,0.98)	0.79 (0.68,0.91)	P<0.01
Liver disease	0.90 (0.77,1.05)	0.67 (0.56,0.80)	0.70 (0.58,0.84)	0.60 (0.49,0.74)	P<0.0001
Others/unknown	0.93 (0.90,0.97)	0.90 (0.86,0.94)	0.88 (0.85,0.92)	0.88 (0.85,0.93)	P<0.0001
All processed meat					
Overall	1.02 (1.00,1.04)	1.05 (1.03,1.07)	1.10 (1.08,1.12)	1.12 (1.10,1.14)	P<0.0001
Cancer	1.01 (0.98,1.04)	1.03 (1.00,1.07)	1.07 (1.03,1.10)	1.08 (1.05,1.11)	P<0.0001
Heart disease	1.01 (0.97,1.04)	1.05 (1.01,1.09)	1.09 (1.05,1.13)	1.12 (1.08,1.16)	P<0.0001
Respiratory diseases	1.16 (1.09,1.25)	1.30 (1.22,1.39)	1.32 (1.24,1.42)	1.35 (1.26,1.45)	P<0.0001
Stroke	1.01 (0.93,1.10)	1.00 (0.92,1.09)	1.09 (1.00,1.19)	1.08 (0.99,1.18)	P<0.05
Diabetes	1.10 (0.97,1.24)	1.15 (1.02,1.29)	1.27 (1.13,1.43)	1.30 (1.16,1.45)	P<0.0001
Infections	1.07 (0.94,1.21)	1.05 (0.92,1.19)	1.17 (1.03,1.33)	1.08 (0.95,1.23)	P=0.3
Alzheimer's disease	0.98 (0.85,1.11)	0.89 (0.77,1.03)	0.97 (0.84,1.12)	1.06 (0.92,1.22)	P=0.2
Kidney disease	1.02 (0.87,1.19)	1.08 (0.92,1.26)	1.10 (0.95,1.29)	1.25 (1.07,1.45)	P<0.0001
Liver disease	1.04 (0.85,1.26)	1.07 (0.88,1.30)	1.07 (0.88,1.31)	1.08 (0.88,1.32)	P=0.6
Others/unknown	1.00 (0.96,1.05)	0.99 (0.95,1.04)	1.06 (1.02,1.11)	1.09 (1.04,1.14)	P<0.0001

* All HR's are versus the first quintile of intake as the reference category. Models are adjusted for sex, age at entry to study, marital status, ethnicity, education, quintiles of a composite deprivation index, perceived health at baseline, history of heart disease, stroke, diabetes and cancer at baseline, smoking history, body mass index, vigorous physical activity, usual activity throughout the day, alcohol consumption, fruit and vegetable intakes, total energy intake, and other types of meat intake.

** Using the median for each quintile.

HR: hazard ratio; CI: confidence interval

Supplementary Table C. HR's and 95% CI for association between meat-associated compounds and mortality in the AARP Diet and Health Study *

	Q2	Q3	Q4	Q5	P for Trend**
Heme Iron					
Overall	1.05 (1.03,1.07)	1.08 (1.06,1.10)	1.09 (1.07,1.11)	1.15 (1.13,1.17)	P<0.0001
Cancer	1.04 (1.01,1.07)	1.06 (1.03,1.09)	1.08 (1.05,1.11)	1.10 (1.07,1.14)	P<0.0001
Heart disease	1.04 (1.01,1.08)	1.08 (1.04,1.12)	1.09 (1.05,1.13)	1.18 (1.14,1.23)	P<0.0001
Respiratory diseases	1.18 (1.10,1.26)	1.24 (1.16,1.32)	1.28 (1.20,1.37)	1.33 (1.24,1.42)	P<0.0001
Stroke	1.02 (0.94,1.11)	1.03 (0.95,1.12)	1.10 (1.01,1.20)	1.11 (1.02,1.21)	P<0.01
Diabetes	1.14 (1.01,1.29)	1.21 (1.07,1.36)	1.19 (1.06,1.34)	1.33 (1.19,1.50)	P<0.0001
Infections	1.06 (0.93,1.20)	1.03 (0.91,1.18)	1.08 (0.95,1.22)	1.13 (1.00,1.29)	P<0.05
Alzheimer's disease	0.87 (0.76,0.99)	0.82 (0.72,0.94)	0.80 (0.70,0.92)	0.84 (0.72,0.97)	P<0.05
Kidney disease	1.13 (0.97,1.32)	1.16 (0.99,1.35)	1.22 (1.05,1.43)	1.34 (1.14,1.56)	P<0.0001
Liver disease	1.15 (0.94,1.40)	1.06 (0.86,1.30)	1.20 (0.98,1.47)	1.31 (1.07,1.61)	P<0.01
Others/unknown	1.03 (0.98,1.07)	1.07 (1.02,1.11)	1.05 (1.00,1.10)	1.10 (1.05,1.15)	P<0.005
Processed meat nitrate					
Overall	1.01 (0.99,1.03)	1.04 (1.02,1.06)	1.09 (1.07,1.12)	1.15 (1.13,1.17)	P<0.0001
Cancer	1.01 (0.98,1.04)	1.03 (0.99,1.06)	1.07 (1.04,1.11)	1.11 (1.08,1.14)	P<0.0001
Heart disease	0.99 (0.96,1.03)	1.05 (1.01,1.08)	1.11 (1.07,1.15)	1.16 (1.12,1.20)	P<0.0001
Respiratory diseases	1.10 (1.02,1.18)	1.23 (1.14,1.31)	1.29 (1.20,1.38)	1.38 (1.29,1.48)	P<0.0001
Stroke	0.89 (0.82,0.97)	0.96 (0.88,1.04)	1.02 (0.93,1.10)	1.05 (0.96,1.14)	P<0.0001
Diabetes	1.11 (0.98,1.26)	1.20 (1.07,1.36)	1.22 (1.08,1.37)	1.39 (1.24,1.55)	P<0.0001
Infections	1.05 (0.92,1.20)	1.07 (0.94,1.22)	1.06 (0.93,1.21)	1.18 (1.04,1.34)	P=0.06
Alzheimer's disease	0.94 (0.83,1.08)	0.87 (0.76,1.00)	0.89 (0.77,1.03)	1.02 (0.89,1.18)	P=0.5
Kidney disease	1.14 (0.97,1.34)	1.13 (0.96,1.33)	1.24 (1.06,1.45)	1.35 (1.16,1.58)	P<0.0001
Liver disease	1.03 (0.84,1.26)	1.08 (0.88,1.32)	1.13 (0.93,1.38)	1.21 (0.99,1.47)	P<0.05
Others/unknown	1.00 (0.95,1.04)	1.00 (0.96,1.05)	1.06 (1.02,1.11)	1.11 (1.06,1.16)	P<0.0001
Processed meat nitrite					
Overall	1.02 (1.00,1.03)	1.05 (1.04,1.07)	1.10 (1.08,1.12)	1.16 (1.14,1.18)	P<0.0001
Cancer	1.00 (0.97,1.03)	1.04 (1.01,1.07)	1.06 (1.03,1.10)	1.11 (1.08,1.15)	P<0.0001
Heart disease	1.00 (0.96,1.04)	1.04 (1.01,1.08)	1.11 (1.07,1.15)	1.17 (1.13,1.21)	P<0.0001
Respiratory diseases	1.13 (1.05,1.21)	1.27 (1.19,1.36)	1.33 (1.24,1.43)	1.42 (1.33,1.52)	P<0.0001
Stroke	0.94 (0.86,1.02)	0.99 (0.91,1.08)	1.04 (0.96,1.14)	1.06 (0.98,1.16)	P=0.1
Diabetes	1.05 (0.93,1.18)	1.16 (1.03,1.31)	1.22 (1.08,1.37)	1.35 (1.21,1.51)	P<0.0001
Infections	1.11 (0.97,1.26)	1.05 (0.92,1.20)	1.11 (0.97,1.26)	1.14 (1.01,1.30)	P=0.9
Alzheimer's disease	0.96 (0.84,1.09)	0.97 (0.85,1.11)	0.87 (0.75,1.00)	1.03 (0.89,1.19)	P=0.2
Kidney disease	1.25 (1.06,1.47)	1.22 (1.04,1.44)	1.29 (1.10,1.51)	1.44 (1.23,1.68)	P<0.005
Liver disease	1.05 (0.86,1.29)	1.20 (0.98,1.47)	1.16 (0.95,1.42)	1.26 (1.03,1.54)	P=0.8
Others/unknown	1.02 (0.97,1.07)	1.01 (0.97,1.06)	1.07 (1.02,1.12)	1.12 (1.07,1.18)	P<0.0001

* All HR's are versus the first quintile of intake as the reference category. Models are adjusted for sex, age at entry to study, marital status, ethnicity, education, quintiles of a composite deprivation index, perceived health at baseline, history of heart disease, stroke, diabetes and cancer at baseline, smoking history, body mass index, vigorous physical activity, usual activity throughout the day, alcohol consumption, fruit and vegetable intakes, and total energy intake.

** Using the median for each quintile.

HR: hazard ratio; CI: confidence interval

Supplementary Table D. HR's and 95% CI for association between meat intake and mortality in the NIH-AARP Diet and Health Study using substitution models among people with no self-reported history of diabetes, heart disease, stroke or cancer*

	Q2	Q3	Q4	Q5	P for trend**
All red meat					
Overall	1.03 (1.00,1.05)	1.10 (1.07,1.13)	1.16 (1.12,1.19)	1.26 (1.22,1.30)	P<0.0001
Cancer	1.01 (0.97,1.05)	1.07 (1.02,1.11)	1.13 (1.08,1.18)	1.17 (1.11,1.23)	P<0.0001
Heart disease	1.00 (0.95,1.06)	1.06 (1.01,1.12)	1.09 (1.02,1.15)	1.24 (1.16,1.32)	P<0.0001
Respiratory diseases	1.23 (1.12,1.34)	1.45 (1.32,1.59)	1.57 (1.42,1.73)	1.91 (1.71,2.13)	P<0.0001
Stroke	1.00 (0.90,1.13)	1.10 (0.98,1.24)	1.20 (1.06,1.36)	1.24 (1.07,1.44)	P<0.001
Diabetes	1.15 (0.87,1.51)	1.41 (1.07,1.86)	1.66 (1.25,2.21)	2.07 (1.50,2.85)	P<0.0001
Infections	1.04 (0.88,1.24)	1.08 (0.90,1.28)	1.18 (0.98,1.42)	1.18 (0.95,1.47)	P=0.08
Alzheimer's disease	0.81 (0.69,0.95)	0.85 (0.72,1.00)	0.85 (0.71,1.01)	0.87 (0.70,1.08)	P=0.3
Kidney disease	0.96 (0.75,1.24)	1.31 (1.02,1.67)	1.31 (1.01,1.71)	1.43 (1.06,1.93)	P<0.001
Liver disease	1.07 (0.81,1.41)	1.50 (1.14,1.97)	1.69 (1.25,2.27)	2.51 (1.78,3.53)	P<0.0001
Others/unknown	1.05 (0.99,1.12)	1.09 (1.02,1.15)	1.14 (1.07,1.22)	1.24 (1.15,1.33)	P<0.0001
Processed red meat					
Overall	0.98 (0.96,1.01)	1.02 (1.00,1.05)	1.06 (1.03,1.09)	1.13 (1.10,1.16)	P<0.0001
Cancer	0.99 (0.96,1.03)	1.03 (0.99,1.07)	1.05 (1.01,1.10)	1.10 (1.05,1.14)	P<0.0001
Heart disease	0.92 (0.87,0.97)	0.96 (0.91,1.01)	1.02 (0.97,1.08)	1.07 (1.01,1.13)	P<0.0001
Respiratory diseases	1.08 (0.99,1.18)	1.27 (1.16,1.39)	1.28 (1.17,1.40)	1.48 (1.35,1.63)	P<0.0001
Stroke	0.92 (0.83,1.03)	0.89 (0.79,1.00)	0.96 (0.85,1.08)	1.04 (0.92,1.18)	P=0.07
Diabetes	1.07 (0.82,1.40)	1.09 (0.84,1.43)	1.36 (1.04,1.77)	1.47 (1.12,1.93)	P<0.001
Infections	0.97 (0.82,1.15)	1.05 (0.89,1.25)	1.03 (0.86,1.22)	1.06 (0.88,1.28)	P=0.4
Alzheimer's disease	0.87 (0.74,1.02)	0.94 (0.80,1.11)	0.82 (0.69,0.98)	0.90 (0.74,1.08)	P=0.4
Kidney disease	0.97 (0.76,1.24)	1.05 (0.83,1.35)	1.05 (0.82,1.35)	1.33 (1.04,1.72)	P<0.001
Liver disease	1.23 (0.95,1.60)	1.03 (0.78,1.36)	1.41 (1.08,1.84)	1.41 (1.07,1.88)	P<0.01
Others/unknown	1.00 (0.94,1.06)	1.02 (0.96,1.08)	1.05 (0.99,1.12)	1.16 (1.08,1.23)	P<0.0001
Unprocessed red meat					
Overall	1.02 (1.00,1.05)	1.07 (1.05,1.10)	1.12 (1.09,1.15)	1.20 (1.16,1.23)	P<0.0001
Cancer	1.00 (0.96,1.04)	1.06 (1.02,1.11)	1.11 (1.07,1.16)	1.14 (1.09,1.19)	P<0.0001
Heart disease	1.00 (0.95,1.06)	1.04 (0.98,1.09)	1.04 (0.98,1.10)	1.19 (1.12,1.27)	P<0.0001
Respiratory diseases	1.24 (1.13,1.35)	1.34 (1.23,1.47)	1.44 (1.31,1.58)	1.62 (1.47,1.80)	P<0.0001
Stroke	1.16 (1.03,1.29)	1.15 (1.02,1.29)	1.24 (1.10,1.41)	1.24 (1.08,1.43)	P<0.01
Diabetes	0.98 (0.75,1.29)	1.26 (0.97,1.64)	1.46 (1.11,1.91)	1.80 (1.34,2.42)	P<0.0001
Infections	1.13 (0.96,1.33)	1.04 (0.88,1.24)	1.08 (0.90,1.30)	1.28 (1.04,1.57)	P<0.05
Alzheimer's disease	0.81 (0.69,0.94)	0.82 (0.70,0.97)	0.82 (0.69,0.98)	0.86 (0.70,1.06)	P=0.2
Kidney disease	1.05 (0.83,1.33)	1.05 (0.83,1.34)	1.12 (0.88,1.44)	1.13 (0.86,1.50)	P=0.3
Liver disease	0.97 (0.74,1.28)	1.27 (0.97,1.66)	1.63 (1.24,2.15)	2.14 (1.56,2.94)	P<0.0001
Others/unknown	1.01 (0.95,1.07)	1.04 (0.98,1.11)	1.07 (1.01,1.14)	1.14 (1.07,1.23)	P<0.0001
All white meat					
Overall	0.91 (0.89,0.93)	0.86 (0.84,0.88)	0.81 (0.79,0.83)	0.74 (0.72,0.77)	P<0.0001
Cancer	0.91 (0.88,0.94)	0.88 (0.85,0.92)	0.86 (0.82,0.89)	0.78 (0.74,0.82)	P<0.0001
Heart disease	0.92 (0.88,0.97)	0.88 (0.83,0.92)	0.80 (0.75,0.85)	0.77 (0.72,0.82)	P<0.001
Respiratory diseases	0.88 (0.82,0.94)	0.78 (0.72,0.84)	0.67 (0.61,0.73)	0.51 (0.46,0.57)	P<0.0001
Stroke	0.91 (0.82,1.01)	0.78 (0.70,0.87)	0.74 (0.65,0.84)	0.77 (0.66,0.90)	P<0.001
Diabetes	0.92 (0.74,1.15)	0.87 (0.69,1.10)	0.76 (0.59,0.99)	0.64 (0.46,0.88)	P<0.05
Infections	1.02 (0.88,1.19)	0.90 (0.76,1.06)	0.92 (0.77,1.11)	0.82 (0.65,1.03)	P=0.06
Alzheimer's disease	1.01 (0.86,1.18)	1.02 (0.86,1.20)	0.82 (0.68,1.00)	1.08 (0.85,1.36)	P=0.9
Kidney disease	0.91 (0.74,1.12)	0.78 (0.62,0.97)	0.79 (0.62,1.01)	0.69 (0.50,0.93)	P<0.01
Liver disease	0.85 (0.70,1.04)	0.51 (0.40,0.66)	0.54 (0.41,0.70)	0.29 (0.20,0.41)	P<0.0001
Others/unknown	0.91 (0.87,0.96)	0.88 (0.83,0.93)	0.83 (0.78,0.89)	0.77 (0.71,0.83)	P<0.0001

Table continues on the next page.

Supplementary Table D-continued. HR's and 95% CI for association between meat intake and mortality in the NIH-AARP Diet and Health Study using substitution models among people with no self-reported history of diabetes, heart disease, stroke or cancer*

	Q2	Q3	Q4	Q5	P for trend**
Processed white meat					
Overall	0.94 (0.92,0.97)	0.96 (0.94,0.98)	0.96 (0.94,0.98)	0.94 (0.92,0.96)	P<0.05
Cancer	0.94 (0.91,0.98)	0.97 (0.94,1.00)	0.95 (0.92,0.98)	0.92 (0.89,0.95)	P<0.0001
Heart disease	0.92 (0.88,0.97)	0.97 (0.92,1.01)	0.97 (0.92,1.01)	0.96 (0.92,1.01)	P=0.4
Respiratory diseases	0.92 (0.85,1.00)	0.88 (0.82,0.95)	0.92 (0.86,0.99)	0.85 (0.79,0.92)	P<0.001
Stroke	0.95 (0.84,1.06)	0.92 (0.84,1.02)	0.96 (0.87,1.07)	0.98 (0.88,1.09)	P<0.01
Diabetes	1.00 (0.77,1.29)	1.06 (0.85,1.32)	1.18 (0.95,1.45)	1.12 (0.90,1.40)	P=0.3
Infections	0.93 (0.78,1.11)	1.04 (0.90,1.21)	1.12 (0.96,1.29)	0.99 (0.85,1.16)	P=0.9
Alzheimer's disease	0.92 (0.77,1.09)	0.97 (0.84,1.13)	1.00 (0.86,1.16)	1.19 (1.02,1.39)	P<0.01
Kidney disease	1.11 (0.88,1.39)	1.04 (0.85,1.27)	0.95 (0.77,1.17)	0.91 (0.73,1.13)	P=0.2
Liver disease	1.06 (0.85,1.32)	0.86 (0.70,1.07)	0.79 (0.63,0.99)	0.65 (0.51,0.84)	P<0.001
Others/unknown	0.97 (0.91,1.03)	0.94 (0.90,0.99)	0.96 (0.91,1.01)	0.97 (0.92,1.03)	P=0.7
Unprocessed white meat					
Overall	0.91 (0.89,0.93)	0.87 (0.85,0.89)	0.81 (0.79,0.83)	0.75 (0.72,0.77)	P<0.0001
Cancer	0.92 (0.89,0.96)	0.90 (0.87,0.94)	0.85 (0.82,0.89)	0.80 (0.76,0.84)	P<0.0001
Heart disease	0.92 (0.88,0.97)	0.86 (0.82,0.90)	0.81 (0.77,0.86)	0.76 (0.71,0.81)	P<0.0001
Respiratory diseases	0.88 (0.82,0.94)	0.79 (0.73,0.85)	0.70 (0.64,0.76)	0.54 (0.48,0.60)	P<0.0001
Stroke	0.88 (0.79,0.97)	0.78 (0.70,0.88)	0.72 (0.63,0.81)	0.72 (0.62,0.84)	P<0.0001
Diabetes	0.86 (0.69,1.07)	0.86 (0.68,1.08)	0.69 (0.54,0.90)	0.57 (0.41,0.78)	P<0.001
Infections	1.00 (0.86,1.17)	0.94 (0.80,1.11)	0.89 (0.74,1.07)	0.86 (0.69,1.08)	P=0.1
Alzheimer's disease	0.94 (0.81,1.10)	0.97 (0.82,1.14)	0.78 (0.65,0.95)	0.90 (0.72,1.14)	P=0.2
Kidney disease	0.89 (0.72,1.09)	0.80 (0.64,1.00)	0.80 (0.63,1.03)	0.73 (0.54,0.98)	P<0.05
Liver disease	0.84 (0.68,1.03)	0.58 (0.45,0.73)	0.55 (0.43,0.72)	0.35 (0.25,0.50)	P<0.0001
Others/unknown	0.91 (0.86,0.95)	0.87 (0.82,0.92)	0.83 (0.78,0.88)	0.77 (0.71,0.83)	P<0.0001
All processed meat					
Overall	1.01 (0.98,1.03)	1.02 (1.00,1.05)	1.07 (1.04,1.10)	1.11 (1.08,1.14)	P<0.0001
Cancer	1.00 (0.96,1.04)	1.02 (0.98,1.06)	1.04 (1.00,1.08)	1.06 (1.02,1.11)	P<0.0001
Heart disease	0.99 (0.94,1.05)	1.00 (0.95,1.06)	1.07 (1.01,1.13)	1.11 (1.05,1.17)	P<0.0001
Respiratory diseases	1.15 (1.05,1.25)	1.31 (1.20,1.43)	1.29 (1.18,1.42)	1.41 (1.29,1.55)	P<0.0001
Stroke	0.94 (0.84,1.05)	0.93 (0.83,1.04)	1.03 (0.92,1.16)	1.07 (0.95,1.21)	P<0.05
Diabetes	1.21 (0.93,1.58)	1.13 (0.86,1.48)	1.31 (1.00,1.71)	1.62 (1.23,2.13)	P<0.0001
Infections	1.07 (0.90,1.26)	1.12 (0.94,1.32)	1.16 (0.98,1.39)	1.08 (0.89,1.30)	P=0.6
Alzheimer's disease	0.99 (0.85,1.16)	0.89 (0.76,1.06)	0.96 (0.80,1.14)	1.02 (0.85,1.23)	P=0.6
Kidney disease	1.03 (0.81,1.31)	1.03 (0.81,1.32)	1.11 (0.87,1.42)	1.27 (0.98,1.63)	P<0.05
Liver disease	1.02 (0.80,1.30)	0.92 (0.71,1.18)	1.06 (0.82,1.36)	1.01 (0.76,1.32)	P=0.8
Others/unknown	1.01 (0.95,1.07)	0.97 (0.91,1.03)	1.04 (0.98,1.11)	1.11 (1.04,1.19)	P<0.0001

* All HR's are versus the first quintile of intake as the reference category. Models are adjusted for sex, age at entry to study, marital status, ethnicity, education, quintiles of a composite deprivation index, perceived health at baseline, smoking history, body mass index, vigorous physical activity, usual activity throughout the day, alcohol consumption, fruit and vegetable intakes, total energy intake, and total meat intake.

** Using the median for each quintile.

HR: hazard ratio; CI: confidence interval

Supplementary Table E. Calibration analysis of the association between error-corrected daily consumption of red meat based on 24-hour recall data* and mortality in the NIH-AARP Diet and Health Study

	Per 20 g increase in predicted intake**
Overall	1.14 (1.13,1.15)
Cancer	1.11 (1.09,1.13)
Heart disease	1.13 (1.11,1.15)
Respiratory diseases	1.34 (1.29,1.40)
Stroke	1.09 (1.04,1.15)
Diabetes	1.18 (1.12,1.25)
Infections	1.14 (1.06,1.22)
Alzheimer's disease	1.01 (0.92,1.10)
Kidney disease	1.23 (1.13,1.34)
Liver disease	1.79 (1.58,2.03)
Others/unknown	1.10 (1.07,1.13)

* We used data from a subset of participants (n=1,877) with two non-consecutive 24-hour dietary recalls, to build a multivariable linear regression model. This regression model included the nutrition density calorie-adjusted mean of the red meat intake in the two 24-hour dietary recalls as the response variable and DHQ nutrition density calorie-adjusted red meat intake as the main predictor. The other *a priori* selected potential predictors in the model included: sex, age at entry to study, ethnicity, education, cigarette smoking, body mass index, vigorous physical activity, alcohol consumption, and fruit and vegetable intakes, total energy intake, and total meat intake. The intercept and beta coefficients from the linear regression model were subsequently used to predict the error-corrected mean two-day calorie-adjusted red meat intake for each participant in the analytic cohort (n=536,969).

** The Cox regression models were built the same way used in the main substitution models in the paper, with each 20-gram increase in the error-corrected mean two-day red meat intake (described above) as the independent variable, and adjusted for all the variables used in the main models.