Dietary amino acids and risk of stroke subtypes: Results from three large prospective cohort studies.

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Table of Content

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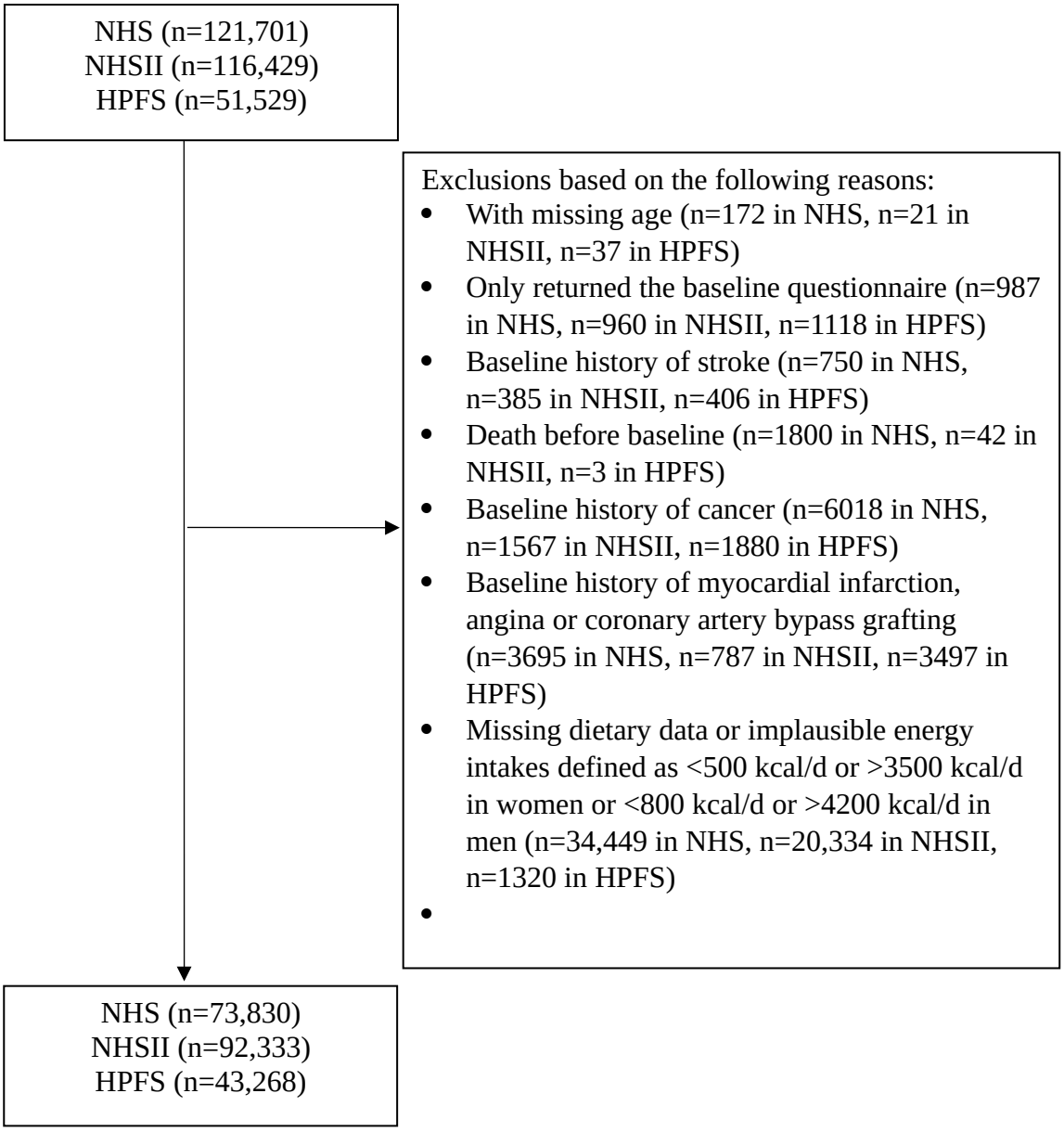


Supplementary figure 1: Participant flow chart of the study

Supplementary table 1: Intakes of dietary amino acids in NHS, NHSII and HPFS at baseline.

	NHS (1984, n=73,830)		**NHSII (1991, n=92,333)**		**HPFS (1986, n=43,268)**	
	Adjusted g/day [1]	Unadjusted g/day [2]	Adjusted g/day [1]	Unadjusted g/day [2]	Adjusted g/day [1]	Unadjusted g/day [2]
Branched-chain amino acids						
Isoleucine	3.3 (0.7)	3.5 (1.2)	4.1 (0.8)	4.0 (1.4)	4.3 (0.8)	4.2 (1.5)
Leucine	5.5 (1.1)	5.9 (1.9)	6.7 (1.2)	6.7 (2.2)	7.1 (1.3)	7.0 (2.4)
Valine	3.6 (0.7)	3.9 (1.3)	4.5 (0.8)	4.4 (1.5)	4.7 (0.9)	4.7 (1.6)
Other essential amino acids						
Histidine	2.0 (0.4)	2.2 (0.7)	2.5 (0.5)	2.4 (0.8)	2.6 (0.5)	2.6 (0.9)
Lysine	5.1 (1.1)	5.4 (1.8)	6.2 (1.4)	6.1 (2.1)	6.5 (1.4)	6.5 (2.3)
Methionine	1.7 (0.4)	1.8 (0.6)	2.0 (0.4)	2.0 (0.7)	2.2 (0.5)	2.2 (0.8)
Phenylalanine	3.0 (0.5)	3.2 (1.0)	3.7 (0.6)	3.7 (1.2)	3.9 (0.7)	3.9 (1.3)
Threonine	2.8 (0.6)	3.0 (1.0)	3.4 (0.7)	3.4 (1.1)	3.6 (0.7)	3.6 (1.2)
Tryptophan	0.8 (0.2)	0.9 (0.3)	1.0 (0.2)	1.0 (0.3)	1.1 (0.2)	1.1 (0.4)
Non-essential amino acids						
Alanine	3.5 (0.7)	3.7 (1.2)	4.1 (0.9)	4.1 (1.4)	4.5 (0.9)	4.5 (1.5)
Arginine	4.1 (0.9)	4.4 (1.4)	4.7 (0.9)	4.7 (1.6)	5.1 (1.0)	5.1 (1.8)
Asparagine	2.6 (0.5)	2.8 (0.9)	2.9 (0.5)	2.9 (1.0)	3.2 (0.6)	3.1 (1.0)
Aspartic acid	3.4 (0.8)	3.6 (1.2)	3.9 (0.9)	3.8 (1.3)	4.2 (0.9)	4.1 (1.4)
Cystine	0.9 (0.2)	0.9 (0.3)	1.1 (0.2)	1.1 (0.3)	1.1 (0.2)	1.1 (0.4)
Glutamine	6.4 (1.0)	6.9 (2.2)	7.8 (1.2)	7.7 (2.5)	8.0 (1.3)	7.9 (2.6)
Glutamic acid	6.8 (1.6)	7.3 (2.5)	7.8 (1.6)	7.7 (2.7)	8.3 (1.7)	8.3 (2.9)
Glycine	3.1 (0.7)	3.3 (1.1)	3.6 (0.8)	3.5 (1.2)	4.0 (0.9)	4.0 (1.4)
Proline	4.2 (0.8)	4.6 (1.5)	5.3 (0.9)	5.2 (1.7)	5.4 (0.9)	5.4 (1.8)
Serine	3.1 (0.5)	3.3 (1.1)	3.8 (0.6)	3.7 (1.2)	3.9 (0.7)	3.9 (1.3)
Tyrosine	2.5 (0.5)	2.7 (0.9)	3.1 (0.6)	3.1 (1.0)	3.2 (0.6)	3.2 (1.1)
Non-standard amino acids						
Hydroxyproline	0.3 (0.1)	0.4 (0.2)	0.3 (0.1)	0.3 (0.1)	0.4 (0.1)	0.4 (0.2)
Taurine	0.1 (0.1)	0.1 (0.1)	0.2 (0.1)	0.2 (0.1)	0.2 (0.1)	0.2 (0.1)

All estimates are mean (SD) of intake.

1. Adjusted for total energy using the residuals method.

2. Not adjusted for total energy.

Supplementary table 2: Baseline characteristics of participants in the Nurses' Health Study (NHS), Nurses' Health Study II (NHSII) and Health Professionals Follow-Up Study (HPFS) by fifths of glutamine intake.

	Fifths of glutamine intake[2]				
Cohort and baseline characteristics[1]	**Q1**	**Q2**	**Q3**	**Q4**	**Q5**
NHS (1984)					
Number of participants	14,853	14,538	14,934	14,736	14,769
Glutamine intake, g/day[2]	5.0 (0.5)	5.9 (0.2)	6.4 (0.1)	6.9 (0.2)	7.8 (0.6)
Age at baseline, years	50.4 (7.2)	50 (7.1)	49.9 (7.1)	50.1 (7.1)	50.5 (7.2)
White ethnicity, %	96.2	97.8	98.1	98.4	98.4
Currently married, %	80.8	82.8	82.7	82.7	82.0
Body mass index, kg/m^2	24.4 (4.6)	24.8 (4.6)	25 (4.6)	25.1 (4.6)	25.6 (4.9)
Physical activity, MET-hrs/ week	12.5 (19.5)	13.8 (21.2)	14.1 (22.4)	14.2 (18.8)	16.1 (22.9)
Smoking status, %					
Never smoker	39.2	44.1	45.2	45.4	46.0
Past smoker	27.7	29.9	32.0	33.3	35.7
Current smoker	33.0	25.9	22.7	21.1	18.1
Alcohol consumption, g/day	11.5 (16.6)	7.8 (11.5)	6.3 (9.4)	5.2 (7.8)	3.8 (6.1)
Current postmenopausal hormone use, %	13.4	14.1	13.5	13.5	13.7
Aspirin use, %	69.7	71.6	71.9	72.0	70.2
Multivitamin use, %	33.0	35.1	36.8	38.2	41.6
Baseline diabetes, %	1.5	2.1	2.7	3.0	4.9
Baseline hypertension, %	21.2	20.2	20.6	20.5	22.2
Baseline high blood cholesterol, %	7.1	7.0	7.8	8.0	9.8
Energy intake, kcal/day	1729.3 (555.6)	1752.2 (534.4)	1759.3 (527.6)	1768.7 (517.4)	1716 (515.5)
Total protein, g/day[2]	59.7 (9.6)	67.4 (8.9)	71.6 (9.4)	75.5 (10)	83.1 (13.5)
Animal protein, g/day[2]	42.9 (10.5)	49.1 (10.6)	52.5 (11.4)	55.7 (12.2)	61.9 (16)
Plant protein, g/day[2]	16.8 (4.2)	18.3 (3.7)	19.1 (3.8)	19.8 (3.8)	21.2 (4.7)
Dairy protein, g/day[2]	10.1 (5.2)	12.4 (5.8)	14.1 (6.6)	15.8 (7.4)	18.6 (9.1)
Saturated fat, g/day[2]	22 (5.1)	22.9 (4.5)	22.7 (4.4)	22.3 (4.3)	21 (4.2)
Monounsaturated fat, g/day[2]	22.5 (4.8)	23.4 (4.2)	23.1 (4.1)	22.5 (3.9)	20.8 (4)
Polyunsaturated fat, g/day[2]	11.9 (3.8)	12.1 (3.1)	12 (2.9)	11.7 (2.8)	11.2 (2.8)
Total carbohydrates, g/day[2]	189.4 (38.8)	183.3 (30.6)	183 (29.1)	183.8 (28.2)	186.2 (28.5)
Total fibre, g/day[2]	14.5 (4.8)	15.7 (4.4)	16.4 (4.5)	17 (4.6)	18.2 (5.1)

	Fifths of glutamine intake[2]				
	Q1	**Q2**	**Q3**	**Q4**	**Q5**
NHSII (1991)					
Number of participants	18,550	18,217	18,604	18,516	18,446
Glutamine intake, g/day[2]	6.1 (0.6)	7.2 (0.2)	7.7 (0.2)	8.4 (0.2)	9.4 (0.7)
Age at baseline, years	36.1 (4.8)	36.2 (4.7)	36.1 (4.7)	36.1 (4.6)	36.1 (4.5)
White ethnicity, %	93.1	96.0	97.3	97.7	98.2
Currently married, %	87.4	89.6	90.4	90.9	89.9
Body mass index, kg/m^2	24.5 (5.6)	24.6 (5.3)	24.7 (5.3)	24.7 (5.2)	24.7 (5.2)
Physical activity, MET-hrs/ week	18.7 (26.5)	19.9 (25.9)	20.6 (26.2)	21.6 (27.1)	23.2 (29.5)
Smoking status, %					
Never smoker	62.6	64.9	66.2	66.8	67.2
Past smoker	19.0	21.5	22.6	23.6	24.5
Current smoker	18.4	13.5	11.1	9.5	8.2
Alcohol consumption, g/day	3.9 (8.5)	3.5 (6.4)	3.1 (5.4)	2.8 (4.8)	2.3 (4.1)
Current postmenopausal hormone use, %	2.9	2.7	2.6	2.4	2.3
Current oral contraceptive use, %	14.8	15.2	14.8	15.5	16.7
Aspirin use, %	12.2	11.2	10.8	11.1	10.6
Multivitamin use, %	39.6	42.9	44.5	45.3	47.0
Baseline diabetes, %	0.7	0.7	1.0	1.1	1.4
Baseline hypertension, %	7.0	6.3	6.2	5.9	6.0
Baseline high blood cholesterol, %	15.2	14.0	14.6	14.5	14.4
Energy intake, kcal/day	1799.4 (588.5)	1782.9 (557.5)	1794.6 (537.5)	1796.4 (532.2)	1774.4 (519.8)
Total protein, g/day[2]	72.4 (11.8)	82.5 (10.9)	87.6 (11.6)	92.1 (12.7)	97.9 (15.8)
Animal protein, g/day[2]	52.6 (13.1)	61 (13.3)	65.2 (14.1)	68.8 (15.3)	72.8 (18.7)
Plant protein, g/day[2]	19.8 (4.9)	21.6 (4.4)	22.5 (4.5)	23.3 (4.6)	25.2 (5.1)
Dairy protein, g/day[2]	13.6 (6.7)	16.9 (7.6)	18.9 (8.3)	20.8 (9.2)	22.8 (10.1)
Saturated fat, g/day[2]	23.1 (5.7)	23.4 (4.8)	22.9 (4.5)	22.1 (4.4)	20.7 (4.3)
Monounsaturated fat, g/day[2]	24.9 (5.5)	25.3 (4.8)	24.6 (4.5)	23.5 (4.3)	21.5 (4.2)
Polyunsaturated fat, g/day[2]	11.2 (3.3)	11.6 (2.8)	11.5 (2.6)	11.2 (2.5)	10.8 (2.4)
Total carbohydrates, g/day[2]	234.6 (39.6)	222 (33.1)	220.4 (31.4)	221.2 (30.8)	225.1 (31.4)
Total fibre, g/day[2]	16.2 (5.7)	17.9 (5.3)	18.5 (5.2)	19 (5.2)	19.9 (5.5)

	Fifths of glutamine intake[2]				
	Q1	**Q2**	**Q3**	**Q4**	**Q5**
HPFS (1986)					
Number of participants	8,639	8,649	8,650	8,672	8,658
Glutamine intake, g/day[2]	6.3 (0.6)	7.3 (0.2)	7.9 (0.2)	8.6 (0.2)	9.8 (0.9)
Age at baseline, years	53.6 (9.7)	53.1 (9.5)	52.9 (9.4)	53 (9.5)	53.2 (9.4)
White ethnicity, %	92.8	94.6	95.4	95.9	96.3
Currently married, %	91.7	93.0	93.5	93.4	93.1
Body mass index, kg/m^2	25.5 (3.2)	25.6 (3.4)	25.6 (3.3)	25.5 (3.3)	25.3 (3.3)
Physical activity, MET-hrs/ week	18.9 (24.7)	19.6 (23.7)	20.7 (24.5)	21.3 (24.2)	23.3 (27.1)
Smoking status, %					
Never smoker	40.3	44.3	47.1	48.3	50.6
Past smoker	43.2	43.4	42.0	42.4	41.3
Current smoker	14.3	10.0	8.4	7.1	5.5
Alcohol consumption, g/day	17.9 (21.7)	12.9 (15.7)	10.8 (13.5)	8.8 (11.3)	6.5 (9)
Aspirin use, %	26.5	27.5	26.4	26.8	26.4
Multivitamin use, %	38.4	39.2	41.5	43.2	46.4
Baseline diabetes, %	1.6	1.9	1.9	2.7	4.3
Baseline hypertension, %	20.9	20.4	19.5	19.1	19.8
Baseline high blood cholesterol, %	9.5	9.4	9.8	11.3	12.4
Energy intake, kcal/day	1979.8 (645.8)	1999.1 (623.3)	2008.8 (608.3)	2012.4 (619.7)	1973.3 (607.1)
Total protein, g/day[2]	78.1 (12.5)	87.9 (11.9)	93 (12.9)	97.8 (13.9)	104.2 (17.6)
Animal protein, g/day[2]	56.2 (14)	64.5 (14)	68.6 (15.3)	72.1 (16.5)	76.1 (20.6)
Plant protein, g/day[2]	21.9 (5.9)	23.4 (5.3)	24.5 (5.3)	25.6 (5.4)	28.1 (6.9)
Dairy protein, g/day[2]	11.4 (6.5)	14.1 (7.5)	15.7 (8.3)	17.6 (9.2)	19.9 (10.8)
Saturated fat, g/day[2]	25.3 (6.6)	25.8 (5.9)	25.2 (5.8)	24.4 (5.8)	22.5 (5.9)
Monounsaturated fat, g/day[2]	28.2 (6.6)	28.7 (5.8)	28.1 (5.6)	27.1 (5.5)	24.8 (5.6)
Polyunsaturated fat, g/day[2]	13.2 (4.2)	13.5 (3.5)	13.4 (3.3)	13.2 (3.1)	12.8 (3.2)
Total carbohydrates, g/day[2]	233 (50.4)	229 (40.6)	231 (39)	234.5 (38.7)	243.2 (40.4)
Total fibre, g/day[2]	18.5 (7.1)	19.7 (6.2)	20.8 (6.4)	21.8 (6.4)	23.6 (7.6)

1. Values are means (SD) for continuous variables and percentages for categorical variables, and standardised the age distribution of the study population.
2. Adjusted for total energy using the residual method.

Supplementary table 3: Baseline characteristics of participants in the Nurses' Health Study (NHS), Nurses' Health Study II (NHSII) and Health Professionals Follow-Up Study (HPFS) by fifths of proline intake.

	Fifths of proline intake[2]				
Cohort and baseline characteristics[1]	**Q1**	**Q2**	**Q3**	**Q4**	**Q5**
NHS (1984)					
Number of participants	14,679	14,700	14,768	14,880	14,803
Proline intake, g/day[2]	3.3 (0.3)	3.8 (0.1)	4.2 (0.1)	4.6 (0.1)	5.3 (0.5)
Age at baseline, years	50.2 (7.2)	50 (7.1)	49.9 (7.1)	50 (7.1)	50.8 (7.1)
White ethnicity, %	96.4	97.7	98.1	98.3	98.4
Currently married, %	81.4	82.5	83.3	82.9	81.0
Body mass index, kg/m^2	24.2 (4.5)	24.7 (4.5)	24.9 (4.6)	25.4 (4.8)	25.7 (4.9)
Physical activity, MET-hrs/ week	12.9 (21.2)	13.5 (19.8)	14 (18.9)	14.8 (23)	15.6 (22.1)
Smoking status, %					
Never smoker	39.8	44.2	45.1	45.6	45.2
Past smoker	28.0	30.8	31.9	33.7	34.2
Current smoker	32.0	24.9	22.9	20.6	20.5
Alcohol consumption, g/day	11 (16.4)	8 (11.6)	6.5 (9.6)	5.2 (8)	3.9 (6.5)
Current postmenopausal hormone use, %	12.8	13.7	13.7	13.9	14.1
Aspirin use, %	69.5	71.6	72.2	71.2	70.8
Multivitamin use, %	32.9	34.0	37.0	38.1	42.6
Baseline diabetes, %	1.4	1.9	2.5	3.4	4.9
Baseline hypertension, %	21.0	19.8	20.4	21.1	22.5
Baseline high blood cholesterol, %	7.6	7.5	7.7	8.2	8.8
Energy intake, kcal/day	1735.2 (561.5)	1755.6 (533.4)	1753.3 (527.4)	1758.8 (520.8)	1721.2 (508)
Total protein, g/day[2]	56.1 (7.2)	65.7 (5.9)	71.2 (6.4)	76.9 (7.3)	87.1 (11.3)
Animal protein, g/day[2]	37.6 (8.1)	46.3 (7.4)	51.7 (7.8)	57.5 (8.7)	68.6 (12.7)
Plant protein, g/day[2]	18.5 (4.7)	19.4 (4.1)	19.5 (4)	19.3 (4.2)	18.5 (4.4)
Dairy protein, g/day[2]	8.1 (3.4)	10.7 (4)	13 (4.5)	15.9 (5.4)	23.3 (8.4)
Saturated fat, g/day[2]	20.4 (4.7)	21.9 (4.2)	22.5 (4.2)	22.9 (4.4)	23 (4.9)
Monounsaturated fat, g/day[2]	21.5 (4.4)	22.9 (4.1)	23 (4.1)	22.9 (4.2)	21.9 (4.5)
Polyunsaturated fat, g/day[2]	12.2 (3.7)	12.3 (3.1)	12 (2.9)	11.6 (2.8)	10.8 (2.8)
Total carbohydrates, g/day[2]	199.5 (35.7)	187.7 (29)	183.7 (28)	179.7 (28.2)	175.3 (30)
Total fibre, g/day[2]	15.4 (5.2)	16.3 (4.6)	16.6 (4.6)	16.8 (4.7)	16.7 (5)

	Fifths of proline intake[2]				
	Q1	**Q2**	**Q3**	**Q4**	**Q5**
NHSII (1991)					
Number of participants	18,478	18,530	18,597	18,318	18,410
Proline intake, g/day[2]	4.1 (0.4)	4.8 (0.1)	5.3 (0.1)	5.7 (0.1)	6.5 (0.5)
Age at baseline, years	36.3 (4.7)	36.3 (4.6)	36.1 (4.7)	36 (4.6)	35.8 (4.6)
White ethnicity, %	93.3	96.2	97.1	97.6	98.0
Currently married, %	87.1	89.7	90.2	90.7	90.4
Body mass index, kg/m^2	24 (5.3)	24.3 (5.2)	24.7 (5.4)	24.9 (5.3)	25.2 (5.4)
Physical activity, MET-hrs/ week	19.7 (27.4)	20.4 (27.3)	20.5 (26.3)	21.3 (26.7)	22.2 (27.9)
Smoking status, %					
Never smoker	63.2	65.4	65.8	66.0	67.3
Past smoker	20.1	21.7	22.6	23.6	23.1
Current smoker	16.6	12.8	11.5	10.3	9.5
Alcohol consumption, g/day	4 (8.5)	3.6 (6.5)	3.1 (5.5)	2.7 (4.8)	2 (3.8)
Current postmenopausal hormone use, %	2.8	2.6	2.6	2.2	2.6
Current oral contraceptive use, %	15.6	15.1	15.2	14.9	16.2
Aspirin use, %	11.8	11.5	11.2	10.9	10.6
Multivitamin use, %	40.1	41.9	43.4	45.3	48.6
Baseline diabetes, %	0.5	0.8	0.9	1.1	1.5
Baseline hypertension, %	6.4	6.0	6.2	6.2	6.6
Baseline high blood cholesterol, %	14.9	14.5	14.3	14.4	14.7
Energy intake, kcal/day	1800.7 (587.7)	1782.8 (556.7)	1796.1 (543.5)	1800.8 (537.3)	1767 (509.7)
Total protein, g/day[2]	68.3 (9.5)	80.2 (7.6)	87 (8.3)	93.4 (9.3)	103.9 (12.9)
Animal protein, g/day[2]	46.1 (11.4)	57.2 (9.5)	64.1 (9.8)	70.8 (10.6)	82.4 (14.2)
Plant protein, g/day[2]	22.2 (6.2)	23 (4.9)	23 (4.6)	22.6 (4.5)	21.5 (4.5)
Dairy protein, g/day[2]	11 (4.6)	14.6 (5.2)	17.4 (5.9)	21.1 (6.9)	28.8 (9.8)
Saturated fat, g/day[2]	21.2 (5.4)	22.5 (4.7)	22.7 (4.6)	22.8 (4.6)	22.9 (4.7)
Monounsaturated fat, g/day[2]	24.1 (5.5)	24.9 (4.8)	24.5 (4.7)	23.8 (4.6)	22.5 (4.4)
Polyunsaturated fat, g/day[2]	11.5 (3.4)	11.7 (2.7)	11.5 (2.6)	11.2 (2.4)	10.5 (2.4)
Total carbohydrates, g/day[2]	245.6 (37.3)	227.4 (30.7)	221.3 (30.1)	217.4 (29.9)	211.7 (30.1)
Total fibre, g/day[2]	17.7 (6.4)	18.5 (5.3)	18.7 (5.1)	18.6 (5.2)	18 (5.3)

	Fifths of proline intake[2]				
	Q1	**Q2**	**Q3**	**Q4**	**Q5**
HPFS (1986)					
Number of participants	8,597	8,728	8,689	8,609	8,645
Proline intake, g/day[2]	4.2 (0.4)	4.9 (0.1)	5.3 (0.1)	5.8 (0.2)	6.7 (0.6)
Age at baseline, years	53.4 (9.7)	52.9 (9.4)	52.9 (9.5)	53 (9.4)	53.7 (9.5)
White ethnicity, %	92.6	94.7	95.5	96.0	96.0
Currently married, %	91.7	93.2	93.6	93.2	93.1
Body mass index, kg/m^2	25.1 (3.2)	25.4 (3.2)	25.5 (3.1)	25.6 (3.3)	25.9 (3.6)
Physical activity, MET-hrs/ week	20.3 (26.2)	20.7 (24.4)	20.6 (24)	21.4 (24.8)	21.0 (25.1)
Smoking status, %					
Never smoker	42.1	45.4	47.1	47.7	48.3
Past smoker	43.2	42.8	42.4	41.9	42.1
Current smoker	12.5	9.3	8.4	8.0	7.1
Alcohol consumption, g/day	18.1 (21.9)	13.2 (15.8)	10.5 (13)	8.5 (10.9)	6.5 (9.3)
Aspirin use, %	26.3	26.3	26.7	27.0	27.3
Multivitamin use, %	39.4	40.5	41.1	42.7	45.1
Baseline diabetes, %	1.4	1.3	1.9	2.8	5.0
Baseline hypertension, %	20.5	19.1	19.3	19.6	21.2
Baseline high blood cholesterol, %	10.3	10.0	10.6	10.5	11.1
Energy intake, kcal/day	1997.3 (646.2)	1997.5 (615)	1991.4 (607.1)	1999.9 (617.6)	1987.3 (619.5)
Total protein, g/day[2]	73.2 (9.7)	85.2 (7.7)	92.2 (8.6)	99.4 (9.9)	111 (14.8)
Animal protein, g/day[2]	49 (11.2)	60.1 (9.8)	67.1 (10.4)	74.2 (11.6)	87.1 (16.4)
Plant protein, g/day[2]	24.3 (7.1)	25.1 (5.9)	25.1 (5.7)	25.1 (5.8)	23.9 (6)
Dairy protein, g/day[2]	9.1 (4.3)	12 (5)	14.4 (5.9)	17.6 (7.1)	25.7 (11)
Saturated fat, g/day[2]	22.8 (6.1)	24.4 (5.7)	25 (5.8)	25.2 (6)	25.9 (6.6)
Monounsaturated fat, g/day[2]	26.7 (6.6)	27.9 (5.9)	28 (5.8)	27.6 (5.8)	26.7 (5.9)
Polyunsaturated fat, g/day[2]	13.3 (4.2)	13.6 (3.5)	13.4 (3.2)	13.2 (3.2)	12.5 (3.1)
Total carbohydrates, g/day[2]	248.1 (49.5)	236.7 (39.8)	232.9 (38.1)	230 (38.5)	222.9 (40.7)
Total fibre, g/day[2]	20.1 (7.8)	20.8 (6.6)	21 (6.3)	21.5 (6.6)	21 (7.4)

1. Values are means (SD) for continuous variables and percentages for categorical variables, and standardised the age distribution of the study population.
2. Adjusted for total energy using the residual method.

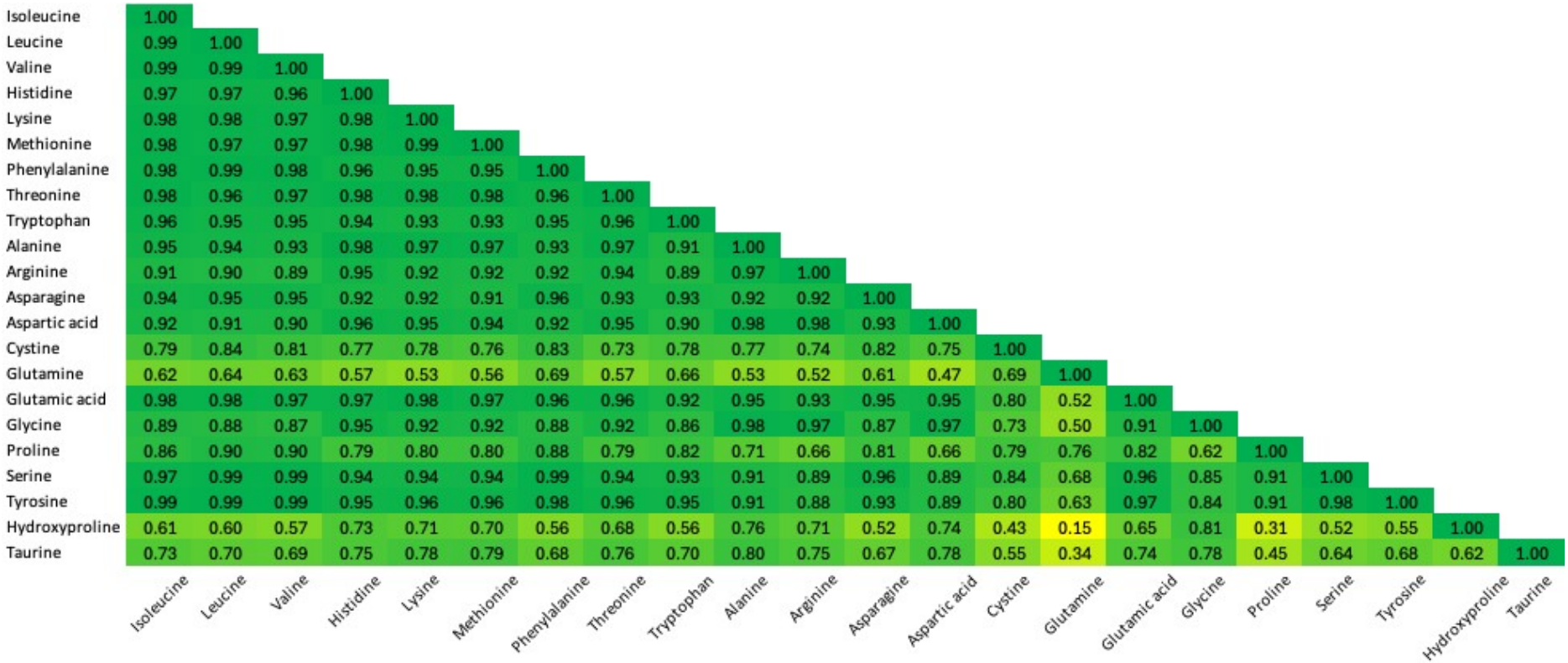
Supplementary table 4: Baseline characteristics of participants in the Nurses' Health Study (NHS), Nurses' Health Study II (NHSII) and Health Professionals Follow-Up Study (HPFS) by fifths of hydroxyproline intake.

	Fifths of hydroxyproline intake[2]				
Cohort and baseline characteristics[1]	**Q1**	**Q2**	**Q3**	**Q4**	**Q5**
NHS (1984)					
Number of participants	15,367	14,234	14,972	13,954	15,303
Hydroxyproline intake, g/day[2]	0.2 (0)	0.3 (0)	0.3 (0)	0.4 (0)	0.5 (0.1)
Age at baseline, years	51.1 (7.2)	50.4 (7.2)	49.8 (7.1)	49.8 (7.1)	49.8 (7)
White ethnicity, %	97.8	98.0	98.0	97.8	97.3
Currently married, %	80.2	82.1	83.2	83.3	82.4
Body mass index, kg/m^2	24.1 (4.2)	24.6 (4.4)	25 (4.7)	25.3 (4.8)	25.9 (5.1)
Physical activity, MET-hrs/week	15.8 (25)	14.5 (21.1)	14.1 (21.5)	13.5 (18.7)	12.9 (18.2)
Smoking status, %					
Never smoker	46.1	43.3	43.9	43.6	43.0
Past smoker	31.2	32.4	32.7	31.1	31.3
Current smoker	22.5	24.2	23.3	25.1	25.6
Alcohol consumption, g/day	7 (12.1)	7.4 (11.6)	7.3 (11.4)	7 (11.1)	5.8 (9.6)
Current postmenopausal hormone use, %	13.5	13.0	13.2	14.5	14.1
Aspirin use, %	69.3	72.0	71.2	71.9	71.2
Multivitamin use, %	39.2	38.0	37.1	35.6	34.8
Baseline diabetes, %	1.9	2.3	2.7	2.9	4.5
Baseline hypertension, %	18.2	19.9	20.7	22.1	24.0
Baseline high blood cholesterol, %	7.5	7.6	7.8	8.3	8.6
Energy intake, kcal/day	1741 (536.3)	1745 (535.6)	1771.2 (530.6)	1765 (524.6)	1705.5 (523.7)
Total protein, g/day[2]	60.5 (10.6)	66.6 (9.5)	70.8 (9.6)	75.4 (9.5)	84 (11.8)
Animal protein, g/day[2]	39.7 (10.9)	46.9 (9.3)	51.8 (9.4)	56.9 (9.3)	66.8 (12.2)
Plant protein, g/day[2]	20.8 (5.4)	19.7 (4.1)	19 (3.8)	18.5 (3.6)	17.2 (3.6)
Dairy protein, g/day[2]	16.6 (8.7)	15.1 (7.6)	14.2 (7.1)	13.3 (6.7)	11.7 (6.3)
Saturated fat, g/day[2]	20.5 (5)	21.4 (4.4)	21.9 (4.3)	22.7 (4)	24.2 (4.2)
Monounsaturated fat, g/day[2]	20.1 (4.3)	21.4 (3.8)	22.2 (3.7)	23.3 (3.6)	25.3 (4)
Polyunsaturated fat, g/day[2]	11.8 (3.5)	11.9 (3.2)	11.8 (3)	11.8 (3)	11.6 (2.9)
Total carbohydrates, g/day[2]	208.3 (30.7)	194.6 (26.2)	186.3 (25.1)	176.6 (24)	159.7 (26)
Total fibre, g/day[2]	17.4 (5.7)	16.7 (4.7)	16.4 (4.6)	16 (4.3)	15.2 (4.4)

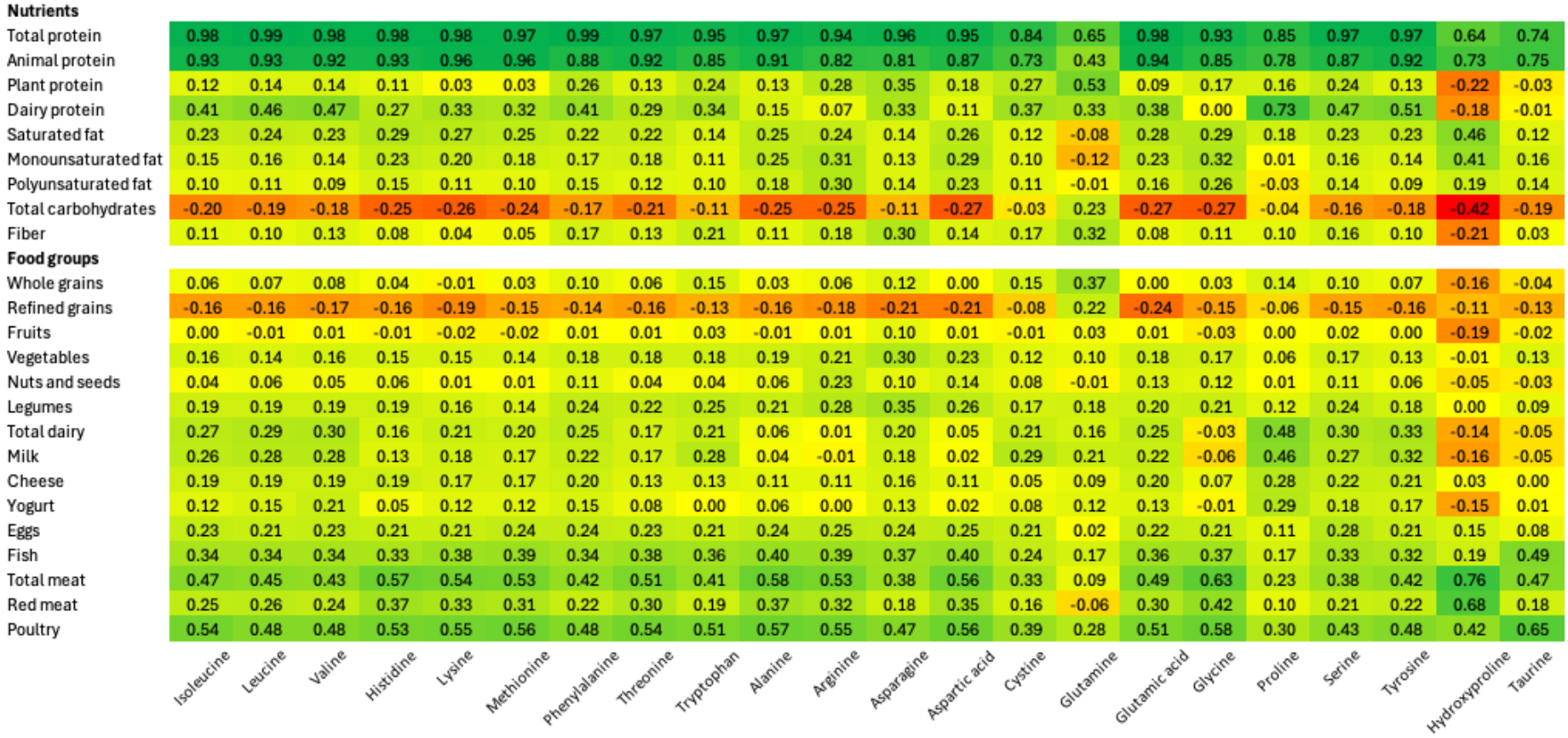
	Fifths of hydroxyproline intake[2]				
	Q1	**Q2**	**Q3**	**Q4**	**Q5**
NHSII (1991)					
Number of participants	19,775	16,082	20,593	18,336	17,547
Hydroxyproline intake, g/day[2]	0.2 (0.1)	0.3 (0)	0.3 (0)	0.4 (0)	0.5 (0.1)
Age at baseline, years	35.8 (4.7)	35.9 (4.7)	36.1 (4.7)	36.2 (4.7)	36.5 (4.6)
White ethnicity, %	96.6	97.2	96.9	96.2	95.2
Currently married, %	87.0	90.1	90.7	90.4	90.1
Body mass index, kg/m^2	23.4 (4.6)	24.1 (5)	24.5 (5)	25.1 (5.5)	26.1 (6.1)
Physical activity, MET-hrs/week	24.8 (32.4)	21.2 (26.9)	20.2 (25.3)	19.3 (24.7)	18.1 (24.3)
Smoking status, %					
Never smoker	66.4	65.8	65.8	65.1	64.3
Past smoker	23.5	23.0	22.6	21.7	20.3
Current smoker	9.9	11.0	11.5	13.1	15.3
Alcohol consumption, g/day	3.4 (6.7)	3.4 (6.5)	3.1 (5.8)	3 (5.8)	2.6 (5.3)
Current postmenopausal hormone use, %	2.2	2.4	2.5	2.7	3.0
Current oral contraceptive use, %	17.4	15.8	15.0	14.9	13.8
Aspirin use, %	11.2	10.8	11.0	11.1	11.9
Multivitamin use, %	49.2	45.8	43.8	41.5	38.3
Baseline diabetes, %	0.6	0.6	0.9	1.0	1.6
Baseline hypertension, %	4.9	5.3	6.0	6.6	8.6
Baseline high blood cholesterol, %	12.9	13.4	14.6	15.3	16.6
Energy intake, kcal/day	1796.7 (563.2)	1819.8 (537.3)	1797.5 (540.8)	1791.9 (544.1)	1741.7 (547.3)
Total protein, g/day[2]	73.3 (12.5)	81.2 (11.1)	86.6 (11.3)	91.8 (11.8)	100.5 (14.4)
Animal protein, g/day[2]	48.3 (13.9)	58.4 (10.9)	64.3 (11.1)	70.2 (11.6)	80.4 (14.7)
Plant protein, g/day[2]	25.1 (6.6)	22.9 (4.5)	22.3 (4.2)	21.6 (4)	20.2 (3.8)
Dairy protein, g/day[2]	21.8 (10.6)	20 (9)	18.8 (8.5)	17.2 (7.9)	14.8 (7.2)
Saturated fat, g/day[2]	20.6 (5.4)	21.8 (4.6)	22.3 (4.4)	23.1 (4.3)	24.7 (4.5)
Monounsaturated fat, g/day[2]	21.3 (4.9)	23 (4.4)	23.8 (4.3)	24.9 (4.3)	27.1 (4.6)
Polyunsaturated fat, g/day[2]	10.8 (3.1)	11.1 (2.7)	11.3 (2.6)	11.5 (2.6)	11.7 (2.6)
Total carbohydrates, g/day[2]	254.1 (32.8)	235.5 (26.2)	225.2 (24.4)	213.4 (23.6)	192.7 (25.6)
Total fibre, g/day[2]	20.1 (6.9)	18.5 (5.3)	18.3 (5)	17.7 (4.8)	16.7 (4.6)

	Fifths of hydroxyproline intake[2]				
	Q1	**Q2**	**Q3**	**Q4**	**Q5**
HPFS (1986)					
Number of participants	8,960	7,833	8,649	8,972	8,854
Hydroxyproline intake, g/day[2]	0.2 (0.1)	0.3 (0)	0.4 (0)	0.5 (0)	0.6 (0.1)
Age at baseline, years	53.7 (9.9)	53.1 (9.7)	53.1 (9.4)	53 (9.3)	52.9 (9.2)
White ethnicity, %	94.7	95.4	95.4	95.4	94.1
Currently married, %	90.8	92.8	94.0	93.7	93.4
Body mass index, kg/m^2	24.8 (3.1)	25.1 (3.1)	25.4 (3.1)	25.8 (3.3)	26.2 (3.6)
Physical activity, MET-hrs/week	24.6 (28.7)	22.4 (25.9)	20.5 (24)	19.2 (22.7)	17.4 (22)
Smoking status, %					
Never smoker	50.7	46.8	45.8	45.0	42.2
Past smoker	40.0	42.1	42.7	42.9	44.7
Current smoker	6.9	8.5	9.2	9.9	10.8
Alcohol consumption, g/day	11.5 (16.9)	12.4 (16.6)	11.9 (15.2)	11.5 (14.8)	9.6 (13.1)
Aspirin use, %	25.8	27.2	27.6	27.2	25.9
Multivitamin use, %	46.6	42.7	40.7	40.0	38.8
Baseline diabetes, %	1.7	1.8	2.1	2.7	4.0
Baseline hypertension, %	18.2	18.4	19.9	20.7	22.3
Baseline high blood cholesterol, %	10.6	10.2	10.6	10.5	10.4
Energy intake, kcal/day	1993.5 (627.6)	1997.1 (619.6)	2028.6 (623.1)	2010.8 (619.5)	1944.4 (612.6)
Total protein, g/day[2]	78.7 (13.2)	86.3 (12.3)	91.5 (12.1)	96.6 (12.4)	107.3 (16.1)
Animal protein, g/day[2]	50.6 (13.8)	60.7 (11.5)	66.7 (11.3)	73 (11.7)	85.7 (16.1)
Plant protein, g/day[2]	28.2 (8)	25.7 (5.6)	24.7 (5)	23.6 (4.7)	21.6 (4.7)
Dairy protein, g/day[2]	19 (10.9)	17 (9.2)	15.8 (8.4)	14.5 (7.8)	12.5 (7.1)
Saturated fat, g/day[2]	21.7 (6.7)	23.3 (5.7)	24.4 (5.5)	25.7 (5.3)	28 (5.6)
Monounsaturated fat, g/day[2]	24.1 (6.5)	25.8 (5.5)	27 (5.1)	28.6 (4.8)	31.3 (5.3)
Polyunsaturated fat, g/day[2]	13.1 (4.2)	13.1 (3.5)	13.2 (3.3)	13.3 (3.1)	13.3 (3.1)
Total carbohydrates, g/day[2]	267.9 (43.4)	247.6 (35.2)	235.4 (32.7)	222.2 (30.7)	198.9 (32.5)
Total fibre, g/day[2]	23.7 (8.7)	21.6 (7)	20.8 (6.1)	19.9 (5.8)	18.4 (5.6)

1. Values are means (SD) for continuous variables and percentages for categorical variables, and standardised the age distribution of the study population.
2. Adjusted for total energy using the residual method.



Supplementary figure 2: Correlation matrix between energy-adjusted grams of dietary amino acids in NHS, NHSII and HPFS, based on dietary data collected at mid-point of follow-up (1998 for NHS, 2003 for NHSII, 1998 for HPFS).



Supplementary figure 3: Correlation matrix between energy-adjusted grams of dietary amino acids and macronutrients and major food groups in NHS, NHSII and HPFS, based on dietary data collected at mid-point of follow-up (1998 for NHS, 2003 for NHSII, 1998 for HPFS).

Supplementary table 5: Hazard ratios (95% confidence intervals) for ischemic stroke (3058 cases) by fifths and per SD difference of energy-adjusted grams of dietary amino acids.

	HR (95% CI), fifths of intake compared to bottom fifth[1]						
Amino acids	**Q2**	**Q3**	**Q4**	**Q5**	***p*-trend[2]**	**HR (95% CI) per SD higher intake[1]**	***p*-value[3]**
Isoleucine							
NHS	0.91 (0.79, 1.06)	0.90 (0.77, 1.04)	0.89 (0.76, 1.03)	0.93 (0.80, 1.07)	0.30	0.97 (0.92, 1.03)	0.31
NHSII	1.43 (0.95, 2.16)	1.06 (0.68, 1.65)	0.64 (0.39, 1.05)	1.19 (0.78, 1.82)	0.68	0.93 (0.79, 1.10)	0.41
HPFS	0.81 (0.68, 0.98)	0.78 (0.65, 0.94)	0.88 (0.74, 1.06)	0.84 (0.70, 1.01)	0.14	0.95 (0.88, 1.02)	0.13
Pooled[4]	**0.90 (0.81, 1.01)**	**0.86 (0.77, 0.97)**	**0.87 (0.78, 0.97)**	**0.91 (0.81, 1.01)**	**0.07**	**0.96 (0.92, 1.00)**	**0.06**
Leucine							
NHS	0.94 (0.81, 1.09)	0.90 (0.77, 1.04)	0.90 (0.78, 1.05)	0.93 (0.80, 1.08)	0.33	0.97 (0.91, 1.02)	0.24
NHSII	1.01 (0.67, 1.54)	1.12 (0.74, 1.69)	0.58 (0.36, 0.94)	1.00 (0.66, 1.51)	0.47	0.94 (0.80, 1.11)	0.49
HPFS	0.87 (0.73, 1.05)	0.80 (0.66, 0.96)	0.87 (0.72, 1.04)	0.89 (0.74, 1.07)	0.25	0.94 (0.88, 1.01)	0.11
Pooled[4]	**0.92 (0.82, 1.03)**	**0.87 (0.78, 0.98)**	**0.87 (0.78, 0.97)**	**0.92 (0.83, 1.03)**	**0.10**	**0.96 (0.92, 1.00)**	**0.04**
Valine							
NHS	0.93 (0.80, 1.08)	0.92 (0.79, 1.07)	0.90 (0.77, 1.04)	0.92 (0.79, 1.07)	0.25	0.96 (0.91, 1.02)	0.19
NHSII	0.98 (0.65, 1.48)	1.04 (0.69, 1.56)	0.54 (0.33, 0.88)	0.98 (0.65, 1.48)	0.44	0.94 (0.80, 1.10)	0.44
HPFS	0.90 (0.75, 1.08)	0.79 (0.65, 0.95)	0.87 (0.72, 1.04)	0.86 (0.72, 1.04)	0.11	0.94 (0.88, 1.01)	0.10
Pooled[4]	**0.92 (0.83, 1.03)**	**0.88 (0.79, 0.98)**	**0.86 (0.77, 0.96)**	**0.90 (0.81, 1.01)**	**0.04**	**0.95 (0.91, 1.00)**	**0.03**
Histidine							
NHS	0.89 (0.77, 1.04)	0.83 (0.72, 0.97)	0.91 (0.78, 1.05)	0.95 (0.82, 1.10)	0.59	0.98 (0.92, 1.03)	0.41
NHSII	1.34 (0.88, 2.05)	0.89 (0.56, 1.41)	0.94 (0.60, 1.47)	1.14 (0.74, 1.75)	0.94	0.94 (0.80, 1.11)	0.46
HPFS	0.80 (0.67, 0.97)	0.86 (0.72, 1.03)	0.85 (0.71, 1.03)	0.93 (0.77, 1.11)	0.56	0.96 (0.89, 1.03)	0.26
Pooled[4]	**0.88 (0.79, 0.99)**	**0.85 (0.76, 0.95)**	**0.89 (0.80, 1.00)**	**0.95 (0.85, 1.06)**	**0.43**	**0.97 (0.93, 1.01)**	**0.13**
Lysine							
NHS	0.87 (0.75, 1.01)	0.89 (0.77, 1.04)	0.91 (0.79, 1.06)	0.91 (0.79, 1.06)	0.40	0.98 (0.92, 1.04)	0.43
NHSII	1.19 (0.78, 1.80)	0.98 (0.64, 1.51)	0.75 (0.48, 1.19)	0.99 (0.65, 1.51)	0.45	0.93 (0.79, 1.10)	0.38
HPFS	0.87 (0.73, 1.04)	0.80 (0.66, 0.96)	0.88 (0.73, 1.06)	0.90 (0.75, 1.08)	0.35	0.95 (0.89, 1.02)	0.19

Pooled[4]	**0.89 (0.80, 1.00)**	**0.86 (0.77, 0.97)**	**0.89 (0.80, 1.00)**	**0.92 (0.82, 1.02)**	**0.15**	**0.96 (0.92, 1.01)**	**0.11**
Methionine							
NHS	0.86 (0.74, 0.99)	0.88 (0.76, 1.02)	0.87 (0.75, 1.01)	0.93 (0.80, 1.08)	0.43	0.97 (0.92, 1.03)	0.34
NHSII	1.48 (0.98, 2.23)	1.00 (0.64, 1.57)	0.83 (0.52, 1.33)	1.06 (0.69, 1.64)	0.42	0.93 (0.79, 1.10)	0.40
HPFS	0.89 (0.74, 1.07)	0.87 (0.72, 1.04)	0.86 (0.72, 1.04)	0.92 (0.76, 1.10)	0.35	0.95 (0.88, 1.02)	0.13
Pooled[4]	**0.90 (0.81, 1.01)**	**0.88 (0.79, 0.99)**	**0.86 (0.77, 0.97)**	**0.93 (0.84, 1.04)**	**0.16**	**0.96 (0.92, 1.00)**	**0.06**
Phenylalanine							
NHS	0.92 (0.80, 1.07)	0.89 (0.76, 1.03)	0.89 (0.77, 1.04)	0.94 (0.81, 1.09)	0.39	0.96 (0.91, 1.02)	0.17
NHSII	0.84 (0.55, 1.27)	0.87 (0.58, 1.31)	0.59 (0.37, 0.93)	0.87 (0.58, 1.30)	0.30	0.93 (0.79, 1.09)	0.35
HPFS	0.83 (0.69, 1.00)	0.80 (0.67, 0.96)	0.85 (0.71, 1.02)	0.87 (0.72, 1.04)	0.16	0.95 (0.88, 1.02)	0.13
Pooled[4]	**0.88 (0.79, 0.99)**	**0.85 (0.76, 0.95)**	**0.85 (0.76, 0.96)**	**0.91 (0.81, 1.01)**	**0.07**	**0.95 (0.91, 0.99)**	**0.03**
Threonine							
NHS	0.93 (0.80, 1.08)	0.85 (0.73, 0.99)	0.96 (0.82, 1.11)	0.95 (0.82, 1.10)	0.67	0.98 (0.92, 1.04)	0.51
NHSII	1.37 (0.90, 2.09)	1.08 (0.69, 1.67)	0.77 (0.48, 1.24)	1.12 (0.73, 1.72)	0.67	0.93 (0.79, 1.10)	0.38
HPFS	0.90 (0.75, 1.08)	0.83 (0.69, 1.01)	0.91 (0.76, 1.09)	0.93 (0.77, 1.11)	0.48	0.95 (0.88, 1.02)	0.15
Pooled[4]	**0.94 (0.84, 1.05)**	**0.86 (0.76, 0.96)**	**0.93 (0.83, 1.04)**	**0.95 (0.85, 1.06)**	**0.37**	**0.96 (0.92, 1.01)**	**0.11**
Tryptophan							
NHS	1.03 (0.89, 1.20)	0.85 (0.73, 1.00)	0.97 (0.83, 1.12)	0.96 (0.82, 1.11)	0.45	0.98 (0.92, 1.04)	0.42
NHSII	1.25 (0.83, 1.88)	0.89 (0.58, 1.39)	0.73 (0.46, 1.16)	1.05 (0.69, 1.59)	0.59	0.94 (0.80, 1.11)	0.46
HPFS	0.87 (0.73, 1.05)	0.82 (0.68, 0.99)	0.88 (0.74, 1.06)	0.86 (0.72, 1.04)	0.16	0.94 (0.88, 1.01)	0.10
Pooled[4]	**0.98 (0.88, 1.10)**	**0.84 (0.75, 0.95)**	**0.92 (0.82, 1.03)**	**0.93 (0.83, 1.04)**	**0.11**	**0.96 (0.92, 1.00)**	**0.07**
Alanine							
NHS	0.85 (0.74, 0.99)	0.88 (0.76, 1.02)	0.91 (0.78, 1.06)	0.95 (0.82, 1.10)	0.77	0.99 (0.93, 1.05)	0.72
NHSII	0.88 (0.58, 1.36)	0.84 (0.55, 1.29)	0.86 (0.56, 1.31)	0.86 (0.57, 1.30)	0.44	0.93 (0.78, 1.10)	0.37
HPFS	0.86 (0.71, 1.03)	0.88 (0.73, 1.06)	0.90 (0.75, 1.08)	0.94 (0.78, 1.13)	0.64	0.96 (0.89, 1.03)	0.27
Pooled[4]	**0.86 (0.77, 0.96)**	**0.88 (0.78, 0.98)**	**0.90 (0.81, 1.01)**	**0.94 (0.84, 1.05)**	**0.46**	**0.97 (0.93, 1.02)**	**0.24**
Arginine							
NHS	0.89 (0.77, 1.03)	0.84 (0.72, 0.98)	0.86 (0.74, 0.99)	0.96 (0.83, 1.12)	0.62	0.99 (0.93, 1.05)	0.74

NHSII	0.88 (0.58, 1.33)	0.77 (0.50, 1.18)	0.75 (0.49, 1.14)	0.80 (0.53, 1.21)	0.22	0.89 (0.76, 1.06)	0.19
HPFS	0.83 (0.69, 1.00)	0.88 (0.73, 1.06)	0.97 (0.81, 1.16)	0.87 (0.72, 1.04)	0.36	0.96 (0.90, 1.04)	0.31
Pooled[4]	**0.87 (0.78, 0.97)**	**0.85 (0.76, 0.95)**	**0.89 (0.80, 0.99)**	**0.92 (0.82, 1.02)**	**0.19**	**0.97 (0.93, 1.02)**	**0.22**
Asparagine							
NHS	0.94 (0.81, 1.09)	0.88 (0.76, 1.03)	0.92 (0.79, 1.07)	0.95 (0.82, 1.11)	0.55	0.98 (0.92, 1.04)	0.44
NHSII	0.82 (0.54, 1.23)	0.70 (0.46, 1.06)	0.62 (0.40, 0.97)	0.83 (0.56, 1.24)	0.24	0.92 (0.79, 1.08)	0.32
HPFS	0.83 (0.69, 1.00)	0.85 (0.70, 1.02)	0.89 (0.74, 1.07)	0.87 (0.73, 1.05)	0.26	0.95 (0.89, 1.02)	0.20
Pooled[4]	**0.89 (0.79, 0.99)**	**0.85 (0.76, 0.96)**	**0.89 (0.79, 0.99)**	**0.91 (0.82, 1.02)**	**0.14**	**0.96 (0.92, 1.01)**	**0.10**
Aspartic acid							
NHS	0.86 (0.74, 0.99)	0.82 (0.71, 0.96)	0.89 (0.77, 1.03)	0.95 (0.82, 1.10)	0.79	1.00 (0.94, 1.06)	0.93
NHSII	1.02 (0.67, 1.56)	0.80 (0.51, 1.26)	0.91 (0.59, 1.40)	0.91 (0.59, 1.38)	0.56	0.92 (0.78, 1.09)	0.33
HPFS	0.93 (0.78, 1.12)	0.88 (0.73, 1.06)	0.87 (0.72, 1.06)	0.98 (0.81, 1.17)	0.66	0.96 (0.90, 1.03)	0.29
Pooled[4]	**0.89 (0.80, 1.00)**	**0.84 (0.75, 0.94)**	**0.89 (0.79, 0.99)**	**0.95 (0.85, 1.07)**	**0.52**	**0.98 (0.93, 1.02)**	**0.32**
Cystine							
NHS	0.94 (0.81, 1.09)	0.83 (0.72, 0.97)	0.86 (0.74, 1.00)	0.93 (0.80, 1.08)	0.20	0.97 (0.92, 1.03)	0.35
NHSII	0.95 (0.63, 1.44)	0.80 (0.52, 1.23)	0.66 (0.42, 1.04)	1.06 (0.71, 1.58)	0.92	0.98 (0.85, 1.14)	0.82
HPFS	0.86 (0.72, 1.04)	0.84 (0.70, 1.01)	0.99 (0.83, 1.19)	0.82 (0.68, 0.99)	0.14	0.95 (0.89, 1.02)	0.17
Pooled[4]	**0.91 (0.82, 1.02)**	**0.83 (0.75, 0.93)**	**0.89 (0.80, 1.00)**	**0.90 (0.80, 1.00)**	**0.06**	**0.97 (0.93, 1.01)**	**0.11**
Glutamine							
NHS	0.81 (0.70, 0.93)	0.83 (0.71, 0.96)	0.81 (0.70, 0.95)	0.82 (0.71, 0.96)	0.01	0.94 (0.88, 0.99)	0.03
NHSII	1.15 (0.77, 1.72)	0.99 (0.65, 1.52)	0.97 (0.63, 1.49)	0.92 (0.59, 1.43)	0.56	0.94 (0.80, 1.10)	0.41
HPFS	0.94 (0.79, 1.12)	0.82 (0.68, 0.99)	0.88 (0.73, 1.06)	0.91 (0.76, 1.10)	0.19	0.94 (0.88, 1.01)	0.11
Pooled[4]	**0.88 (0.79, 0.98)**	**0.84 (0.75, 0.93)**	**0.85 (0.76, 0.95)**	**0.86 (0.77, 0.97)**	**0.007**	**0.94 (0.90, 0.98)**	**0.004**
Glutamic acid							
NHS	0.87 (0.75, 1.01)	0.84 (0.72, 0.97)	0.85 (0.74, 0.99)	0.89 (0.77, 1.03)	0.18	0.97 (0.92, 1.03)	0.37
NHSII	1.18 (0.78, 1.78)	0.94 (0.61, 1.45)	0.73 (0.46, 1.16)	1.01 (0.66, 1.53)	0.51	0.92 (0.78, 1.08)	0.31
HPFS	0.80 (0.67, 0.96)	0.81 (0.67, 0.97)	0.79 (0.66, 0.95)	0.88 (0.73, 1.05)	0.20	0.95 (0.88, 1.02)	0.13
Pooled[4]	**0.86 (0.77, 0.96)**	**0.83 (0.74, 0.93)**	**0.82 (0.73, 0.92)**	**0.90 (0.80, 1.00)**	**0.05**	**0.96 (0.92, 1.00)**	**0.06**

Glycine							
NHS	0.90 (0.78, 1.05)	0.90 (0.77, 1.04)	0.94 (0.81, 1.09)	0.97 (0.84, 1.13)	0.97	1.00 (0.94, 1.06)	0.93
NHSII	0.92 (0.60, 1.42)	0.85 (0.55, 1.31)	0.98 (0.64, 1.48)	0.82 (0.54, 1.26)	0.38	0.92 (0.78, 1.09)	0.34
HPFS	0.85 (0.70, 1.02)	0.89 (0.74, 1.08)	0.93 (0.77, 1.11)	0.97 (0.81, 1.16)	0.99	0.97 (0.90, 1.04)	0.34
Pooled[4]	**0.88 (0.79, 0.99)**	**0.89 (0.80, 1.00)**	**0.94 (0.84, 1.05)**	**0.96 (0.86, 1.07)**	**0.80**	**0.98 (0.94, 1.02)**	**0.37**
Proline							
NHS	0.92 (0.80, 1.06)	0.79 (0.68, 0.92)	0.94 (0.81, 1.09)	0.83 (0.71, 0.96)	0.03	0.94 (0.89, 0.99)	0.02
NHSII	1.19 (0.79, 1.79)	1.01 (0.66, 1.55)	0.81 (0.51, 1.28)	1.08 (0.71, 1.65)	0.85	0.97 (0.83, 1.14)	0.73
HPFS	0.92 (0.77, 1.10)	0.88 (0.74, 1.06)	0.71 (0.58, 0.86)	0.86 (0.71, 1.03)	0.02	0.94 (0.88, 1.01)	0.09
Pooled[4]	**0.94 (0.84, 1.04)**	**0.84 (0.75, 0.94)**	**0.84 (0.75, 0.95)**	**0.85 (0.76, 0.96)**	**0.002**	**0.94 (0.90, 0.98)**	**0.005**
Serine							
NHS	0.90 (0.78, 1.04)	0.88 (0.76, 1.02)	0.87 (0.75, 1.01)	0.93 (0.80, 1.08)	0.32	0.96 (0.90, 1.01)	0.14
NHSII	0.93 (0.61, 1.40)	0.85 (0.56, 1.29)	0.66 (0.42, 1.03)	0.91 (0.61, 1.37)	0.41	0.94 (0.80, 1.11)	0.47
HPFS	0.85 (0.71, 1.02)	0.84 (0.70, 1.01)	0.83 (0.69, 0.99)	0.85 (0.70, 1.02)	0.08	0.95 (0.88, 1.02)	0.14
Pooled[4]	**0.88 (0.79, 0.98)**	**0.86 (0.77, 0.96)**	**0.84 (0.75, 0.94)**	**0.90 (0.80, 1.01)**	**0.04**	**0.95 (0.91, 0.99)**	**0.03**
Tyrosine							
NHS	0.90 (0.78, 1.04)	0.94 (0.81, 1.09)	0.87 (0.75, 1.01)	0.92 (0.79, 1.06)	0.23	0.96 (0.90, 1.01)	0.14
NHSII	1.02 (0.67, 1.56)	1.05 (0.69, 1.59)	0.68 (0.42, 1.08)	0.99 (0.65, 1.50)	0.57	0.93 (0.79, 1.10)	0.40
HPFS	0.89 (0.75, 1.07)	0.77 (0.63, 0.92)	0.85 (0.70, 1.02)	0.87 (0.72, 1.04)	0.10	0.94 (0.87, 1.01)	0.07
Pooled[4]	**0.91 (0.81, 1.01)**	**0.88 (0.79, 0.98)**	**0.85 (0.76, 0.95)**	**0.90 (0.81, 1.01)**	**0.04**	**0.95 (0.91, 0.99)**	**0.015**
Hydroxyproline							
NHS	1.03 (0.88, 1.19)	1.03 (0.89, 1.21)	1.03 (0.89, 1.21)	1.12 (0.97, 1.30)	0.11	1.03 (0.97, 1.09)	0.33
NHSII	0.71 (0.44, 1.15)	1.10 (0.72, 1.68)	0.95 (0.62, 1.47)	0.89 (0.58, 1.37)	0.79	0.99 (0.84, 1.15)	0.87
HPFS	1.02 (0.85, 1.24)	1.03 (0.85, 1.24)	1.06 (0.87, 1.28)	1.15 (0.95, 1.39)	0.12	1.02 (0.95, 1.09)	0.61
Pooled[4]	**1.00 (0.90, 1.13)**	**1.04 (0.92, 1.16)**	**1.04 (0.92, 1.16)**	**1.11 (0.99, 1.25)**	**0.04**	**1.02 (0.98, 1.07)**	**0.33**
Taurine							
NHS	1.02 (0.88, 1.19)	0.93 (0.80, 1.08)	0.94 (0.81, 1.09)	1.00 (0.86, 1.16)	0.78	0.99 (0.94, 1.05)	0.79

NHSII	0.75 (0.48, 1.16)	0.94 (0.62, 1.42)	0.82 (0.54, 1.25)	0.84 (0.56, 1.27)	0.47	0.96 (0.80, 1.15)	0.67
HPFS	0.80 (0.66, 0.96)	0.86 (0.71, 1.03)	0.85 (0.71, 1.02)	0.88 (0.73, 1.05)	0.31	0.96 (0.89, 1.03)	0.26
Pooled[4]	**0.92 (0.82, 1.03)**	**0.90 (0.81, 1.01)**	**0.90 (0.80, 1.00)**	**0.94 (0.84, 1.05)**	**0.27**	**0.98 (0.94, 1.02)**	**0.32**

1. Analyses were stratified by age (in years) and follow-up intervals, and adjusted for ethnicity (white, non-white), marital status (married, widowed, divorced/separated, unknown), smoking status (never, past, current: 1–14, 15–24, ≥25 cigarettes/day, unknown status or cigarette number), alcohol intake (never drinkers, 0.1-4.9, 5.0-9.9, 10.0-14.9, 15.0+ g/d), physical activity (<3, 3–9, 9–18, 18–27, 27–42, ≥42 metabolic equivalents/week, unknown), menopausal status and postmenopausal hormone use (premenopausal, postmenopausal: never, past, current users, NHS and NHSII only), oral contraception use (never, past, current user, NHSII only), multivitamin use (no, yes), aspirin use (no, yes), body mass index (<23, 23–24.9, 25–29.9, 30–34.9, ≥35 kg/m^2, missing), baseline history of hypertension (no, yes), baseline hypercholesteremia (no, yes), baseline diabetes (no, yes), and energy intake (fifths of intake).
2. Linear trends estimated by fitting the median values in each fifth of intake as a pseudo-continuous variable in the Cox regression.
3. P-values estimated by fitting the continuous intakes of dietary amino acids in the Cox regression.
4. Results from NHS, NHSII and HPFS were pooled using a fixed-effects meta-analysis.

Supplementary table 6: Hazard ratios (95% confidence intervals) for hemorrhagic stroke (872 cases) by fifths and per SD difference of energy-adjusted grams of dietary amino acids.

	HR (95% CI), fifths of intake compared to bottom fifth[1]					**HR (95% CI) per SD higher**	
Amino acids	**Q2**	**Q3**	**Q4**	**Q5**	***p*-trend[2]**	**intake[1]**	***p*-value[3]**
Isoleucine							
NHS	1.17 (0.89, 1.52)	0.90 (0.68, 1.20)	0.98 (0.74, 1.30)	0.99 (0.75, 1.32)	0.62	0.95 (0.85, 1.06)	0.33
NHSII	1.31 (0.70, 2.44)	1.37 (0.74, 2.56)	1.11 (0.57, 2.14)	0.88 (0.44, 1.78)	0.69	1.00 (0.78, 1.28)	1.00
HPFS	1.14 (0.80, 1.63)	1.00 (0.69, 1.44)	0.90 (0.62, 1.32)	0.96 (0.66, 1.40)	0.47	0.98 (0.85, 1.12)	0.74
Pooled[4]	**1.17 (0.96, 1.44)**	**0.98 (0.79, 1.21)**	**0.97 (0.78, 1.20)**	**0.97 (0.78, 1.20)**	**0.34**	**0.96 (0.89, 1.04)**	**0.36**
Leucine							
NHS	1.19 (0.91, 1.55)	0.92 (0.69, 1.23)	0.99 (0.75, 1.32)	1.00 (0.75, 1.34)	0.67	0.95 (0.85, 1.06)	0.37
NHSII	1.25 (0.66, 2.35)	1.44 (0.78, 2.67)	1.23 (0.64, 2.35)	0.77 (0.37, 1.59)	0.62	0.99 (0.78, 1.27)	0.95
HPFS	1.14 (0.80, 1.63)	0.89 (0.60, 1.30)	1.08 (0.75, 1.55)	0.96 (0.66, 1.40)	0.71	0.98 (0.85, 1.12)	0.78
Pooled[4]	**1.18 (0.96, 1.44)**	**0.96 (0.78, 1.19)**	**1.05 (0.85, 1.29)**	**0.97 (0.78, 1.20)**	**0.49**	**0.97 (0.89, 1.05)**	**0.40**
Valine							
NHS	1.11 (0.85, 1.46)	0.94 (0.71, 1.25)	0.94 (0.70, 1.25)	0.97 (0.73, 1.29)	0.55	0.95 (0.85, 1.06)	0.34
NHSII	1.02 (0.54, 1.92)	1.18 (0.64, 2.18)	1.16 (0.62, 2.17)	0.75 (0.37, 1.51)	0.66	1.00 (0.78, 1.27)	0.97
HPFS	1.17 (0.82, 1.67)	0.87 (0.60, 1.28)	1.02 (0.70, 1.47)	0.96 (0.66, 1.40)	0.59	0.97 (0.85, 1.12)	0.71
Pooled[4]	**1.12 (0.92, 1.37)**	**0.95 (0.77, 1.17)**	**0.99 (0.80, 1.22)**	**0.95 (0.76, 1.17)**	**0.36**	**0.96 (0.89, 1.04)**	**0.34**
Histidine							
NHS	1.11 (0.85, 1.46)	1.04 (0.79, 1.38)	1.05 (0.79, 1.40)	1.02 (0.77, 1.36)	0.96	0.97 (0.87, 1.09)	0.64
NHSII	0.95 (0.50, 1.80)	1.00 (0.53, 1.88)	1.28 (0.70, 2.34)	0.77 (0.39, 1.53)	0.83	0.98 (0.77, 1.25)	0.87
HPFS	0.96 (0.67, 1.37)	0.80 (0.55, 1.16)	1.02 (0.72, 1.45)	0.81 (0.55, 1.18)	0.34	0.97 (0.84, 1.11)	0.66
Pooled[4]	**1.04 (0.85, 1.28)**	**0.95 (0.77, 1.18)**	**1.07 (0.87, 1.31)**	**0.92 (0.74, 1.14)**	**0.46**	**0.97 (0.90, 1.06)**	**0.51**
Lysine							
NHS	1.07 (0.82, 1.40)	1.00 (0.76, 1.32)	0.92 (0.69, 1.22)	1.00 (0.75, 1.32)	0.69	0.96 (0.86, 1.07)	0.48
NHSII	1.06 (0.55, 2.04)	1.35 (0.73, 2.52)	1.31 (0.70, 2.47)	0.85 (0.43, 1.72)	0.95	0.99 (0.77, 1.27)	0.94
HPFS	1.09 (0.76, 1.55)	0.89 (0.61, 1.29)	1.09 (0.76, 1.56)	0.87 (0.59, 1.27)	0.47	0.98 (0.86, 1.13)	0.82

Pooled[4]	**1.07 (0.88, 1.32)**	**1.00 (0.81, 1.23)**	**1.01 (0.82, 1.25)**	**0.94 (0.76, 1.16)**	**0.44**	**0.97 (0.90, 1.05)**	**0.49**
Methionine							
NHS	1.17 (0.89, 1.52)	0.90 (0.67, 1.20)	1.00 (0.75, 1.33)	1.02 (0.77, 1.36)	0.81	0.95 (0.85, 1.06)	0.35
NHSII	1.27 (0.66, 2.43)	1.46 (0.78, 2.75)	1.35 (0.71, 2.58)	0.92 (0.45, 1.87)	0.99	0.99 (0.77, 1.27)	0.93
HPFS	1.06 (0.75, 1.52)	0.82 (0.56, 1.19)	1.07 (0.75, 1.52)	0.87 (0.60, 1.26)	0.44	0.98 (0.85, 1.12)	0.74
Pooled[4]	**1.14 (0.93, 1.40)**	**0.92 (0.74, 1.15)**	**1.06 (0.86, 1.30)**	**0.96 (0.77, 1.19)**	**0.49**	**0.96 (0.89, 1.04)**	**0.36**
Phenylalanine							
NHS	1.03 (0.79, 1.35)	0.95 (0.72, 1.26)	0.92 (0.69, 1.22)	1.01 (0.76, 1.34)	0.83	0.95 (0.86, 1.06)	0.39
NHSII	1.22 (0.66, 2.27)	1.36 (0.74, 2.51)	1.04 (0.54, 2.00)	0.72 (0.35, 1.49)	0.42	0.97 (0.76, 1.24)	0.82
HPFS	0.91 (0.64, 1.30)	0.82 (0.57, 1.18)	0.85 (0.59, 1.23)	0.86 (0.60, 1.24)	0.36	0.97 (0.85, 1.11)	0.67
Pooled[4]	**1.01 (0.82, 1.24)**	**0.95 (0.77, 1.16)**	**0.91 (0.73, 1.12)**	**0.93 (0.75, 1.15)**	**0.30**	**0.96 (0.89, 1.04)**	**0.34**
Threonine							
NHS	1.18 (0.90, 1.54)	1.00 (0.75, 1.33)	1.05 (0.79, 1.39)	0.99 (0.74, 1.32)	0.73	0.96 (0.86, 1.07)	0.43
NHSII	1.02 (0.54, 1.91)	1.28 (0.70, 2.32)	1.02 (0.54, 1.93)	0.72 (0.36, 1.45)	0.52	0.96 (0.75, 1.23)	0.76
HPFS	1.05 (0.73, 1.50)	0.86 (0.59, 1.25)	1.06 (0.74, 1.52)	0.84 (0.57, 1.23)	0.38	0.98 (0.86, 1.13)	0.82
Pooled[4]	**1.12 (0.91, 1.37)**	**0.98 (0.80, 1.22)**	**1.05 (0.85, 1.29)**	**0.91 (0.73, 1.13)**	**0.30**	**0.97 (0.89, 1.05)**	**0.41**
Tryptophan							
NHS	1.23 (0.93, 1.61)	1.07 (0.80, 1.42)	0.98 (0.73, 1.31)	1.06 (0.80, 1.41)	0.84	0.96 (0.86, 1.08)	0.49
NHSII	1.68 (0.89, 3.15)	1.65 (0.88, 3.11)	0.98 (0.48, 2.03)	1.06 (0.52, 2.15)	0.72	0.97 (0.76, 1.24)	0.80
HPFS	1.12 (0.79, 1.60)	0.91 (0.62, 1.32)	0.91 (0.63, 1.32)	0.92 (0.63, 1.34)	0.40	0.98 (0.85, 1.12)	0.75
Pooled[4]	**1.23 (1.00, 1.51)**	**1.06 (0.86, 1.32)**	**0.95 (0.76, 1.19)**	**1.01 (0.81, 1.26)**	**0.42**	**0.97 (0.89, 1.05)**	**0.43**
Alanine							
NHS	1.01 (0.77, 1.33)	0.99 (0.75, 1.31)	1.12 (0.85, 1.47)	0.91 (0.68, 1.22)	0.72	0.97 (0.87, 1.09)	0.64
NHSII	1.17 (0.63, 2.18)	1.04 (0.55, 1.97)	1.14 (0.61, 2.13)	0.84 (0.42, 1.65)	0.69	0.95 (0.74, 1.22)	0.68
HPFS	0.90 (0.63, 1.29)	0.85 (0.59, 1.23)	1.02 (0.72, 1.46)	0.86 (0.59, 1.24)	0.54	0.99 (0.86, 1.14)	0.89
Pooled[4]	**0.99 (0.80, 1.21)**	**0.95 (0.77, 1.17)**	**1.09 (0.89, 1.33)**	**0.89 (0.71, 1.10)**	**0.43**	**0.98 (0.90, 1.06)**	**0.57**
Arginine							
NHS	0.92 (0.70, 1.22)	1.08 (0.82, 1.42)	1.03 (0.78, 1.36)	0.91 (0.68, 1.21)	0.68	0.97 (0.86, 1.08)	0.56

NHSII	1.36 (0.73, 2.53)	1.22 (0.65, 2.30)	0.92 (0.47, 1.82)	1.01 (0.52, 1.96)	0.74	0.95 (0.74, 1.22)	0.67
HPFS	0.97 (0.68, 1.39)	0.99 (0.69, 1.41)	0.83 (0.57, 1.21)	0.92 (0.63, 1.32)	0.44	1.00 (0.87, 1.15)	0.96
Pooled[4]	**0.98 (0.80, 1.21)**	**1.06 (0.87, 1.30)**	**0.95 (0.77, 1.18)**	**0.92 (0.74, 1.14)**	**0.37**	**0.98 (0.90, 1.06)**	**0.59**
Asparagine							
NHS	0.95 (0.72, 1.24)	0.95 (0.72, 1.25)	0.89 (0.67, 1.18)	0.88 (0.66, 1.17)	0.33	0.93 (0.83, 1.04)	0.20
NHSII	1.51 (0.83, 2.77)	1.21 (0.64, 2.28)	0.99 (0.50, 1.93)	0.78 (0.38, 1.59)	0.31	0.93 (0.73, 1.18)	0.54
HPFS	0.95 (0.66, 1.36)	0.96 (0.67, 1.37)	0.82 (0.57, 1.20)	0.87 (0.60, 1.26)	0.32	0.97 (0.85, 1.12)	0.70
Pooled[4]	**1.00 (0.82, 1.23)**	**0.97 (0.79, 1.20)**	**0.88 (0.71, 1.09)**	**0.87 (0.70, 1.07)**	**0.10**	**0.94 (0.87, 1.02)**	**0.17**
Aspartic acid							
NHS	1.03 (0.78, 1.35)	0.90 (0.68, 1.20)	1.04 (0.79, 1.37)	1.00 (0.75, 1.33)	0.99	0.96 (0.86, 1.08)	0.53
NHSII	1.15 (0.63, 2.11)	0.87 (0.45, 1.67)	1.07 (0.57, 1.99)	0.78 (0.40, 1.52)	0.47	0.94 (0.73, 1.21)	0.64
HPFS	0.93 (0.65, 1.32)	0.93 (0.65, 1.33)	0.81 (0.56, 1.18)	0.90 (0.62, 1.30)	0.42	1.00 (0.87, 1.15)	0.98
Pooled[4]	**1.01 (0.82, 1.23)**	**0.91 (0.74, 1.12)**	**0.96 (0.78, 1.19)**	**0.94 (0.76, 1.16)**	**0.43**	**0.97 (0.90, 1.06)**	**0.55**
Cystine							
NHS	1.05 (0.81, 1.37)	0.88 (0.66, 1.17)	0.97 (0.74, 1.29)	0.89 (0.66, 1.19)	0.34	0.93 (0.84, 1.03)	0.19
NHSII	1.26 (0.67, 2.35)	1.34 (0.72, 2.50)	1.02 (0.52, 1.99)	0.91 (0.46, 1.82)	0.70	0.98 (0.78, 1.24)	0.88
HPFS	0.70 (0.48, 1.01)	0.89 (0.63, 1.26)	0.81 (0.57, 1.17)	0.78 (0.54, 1.12)	0.31	0.96 (0.84, 1.10)	0.54
Pooled[4]	**0.94 (0.77, 1.16)**	**0.92 (0.75, 1.14)**	**0.92 (0.75, 1.13)**	**0.85 (0.69, 1.06)**	**0.15**	**0.95 (0.87, 1.02)**	**0.16**
Glutamine							
NHS	0.99 (0.76, 1.29)	1.01 (0.77, 1.33)	0.76 (0.56, 1.02)	0.93 (0.70, 1.23)	0.26	0.90 (0.81, 1.00)	0.05
NHSII	1.27 (0.70, 2.32)	0.94 (0.49, 1.82)	1.09 (0.57, 2.07)	0.91 (0.46, 1.79)	0.75	0.94 (0.74, 1.20)	0.63
HPFS	0.86 (0.61, 1.23)	0.89 (0.62, 1.27)	0.83 (0.57, 1.20)	0.81 (0.55, 1.18)	0.25	0.90 (0.78, 1.04)	0.16
Pooled[4]	**0.97 (0.80, 1.19)**	**0.96 (0.79, 1.18)**	**0.81 (0.65, 1.01)**	**0.88 (0.71, 1.10)**	**0.11**	**0.91 (0.83, 0.98)**	**0.02**
Glutamic acid							
NHS	1.05 (0.80, 1.37)	0.92 (0.70, 1.23)	0.94 (0.71, 1.25)	0.97 (0.73, 1.29)	0.68	0.94 (0.84, 1.06)	0.32
NHSII	1.06 (0.56, 2.01)	1.11 (0.59, 2.08)	1.23 (0.66, 2.29)	0.86 (0.44, 1.69)	0.88	1.00 (0.78, 1.27)	0.99
HPFS	1.04 (0.72, 1.49)	1.01 (0.70, 1.46)	1.07 (0.75, 1.54)	0.88 (0.60, 1.30)	0.57	0.99 (0.87, 1.14)	0.91
Pooled[4]	**1.04 (0.85, 1.28)**	**0.97 (0.79, 1.20)**	**1.01 (0.82, 1.25)**	**0.93 (0.75, 1.15)**	**0.48**	**0.97 (0.89, 1.05)**	**0.42**

Glycine							
NHS	0.92 (0.69, 1.21)	1.01 (0.77, 1.33)	1.05 (0.80, 1.38)	0.93 (0.70, 1.23)	0.82	1.00 (0.89, 1.11)	0.95
NHSII	1.44 (0.76, 2.76)	1.41 (0.74, 2.69)	1.26 (0.65, 2.45)	0.98 (0.48, 1.98)	0.86	0.97 (0.76, 1.24)	0.80
HPFS	0.69 (0.48, 1.00)	0.70 (0.49, 1.01)	0.90 (0.64, 1.26)	0.76 (0.53, 1.09)	0.32	0.99 (0.86, 1.14)	0.93
Pooled[4]	**0.88 (0.71, 1.08)**	**0.93 (0.75, 1.14)**	**1.01 (0.82, 1.24)**	**0.87 (0.70, 1.08)**	**0.38**	**0.99 (0.91, 1.08)**	**0.85**
Proline							
NHS	1.12 (0.86, 1.46)	0.88 (0.66, 1.18)	0.92 (0.69, 1.23)	1.00 (0.75, 1.33)	0.64	0.95 (0.85, 1.06)	0.34
NHSII	1.78 (0.98, 3.25)	0.97 (0.48, 1.95)	1.07 (0.53, 2.15)	1.29 (0.66, 2.54)	0.91	1.03 (0.82, 1.31)	0.78
HPFS	0.76 (0.53, 1.09)	0.89 (0.63, 1.26)	0.65 (0.44, 0.96)	0.91 (0.64, 1.30)	0.47	0.96 (0.84, 1.10)	0.54
Pooled[4]	**1.05 (0.85, 1.28)**	**0.89 (0.72, 1.10)**	**0.84 (0.67, 1.04)**	**0.99 (0.81, 1.23)**	**0.46**	**0.96 (0.89, 1.04)**	**0.33**
Serine							
NHS	1.12 (0.86, 1.47)	0.93 (0.70, 1.23)	0.90 (0.67, 1.20)	1.00 (0.76, 1.33)	0.60	0.95 (0.85, 1.06)	0.35
NHSII	1.27 (0.69, 2.34)	1.21 (0.64, 2.26)	1.22 (0.65, 2.29)	0.68 (0.32, 1.42)	0.42	0.99 (0.78, 1.26)	0.94
HPFS	1.17 (0.82, 1.66)	0.80 (0.55, 1.18)	0.99 (0.69, 1.44)	0.95 (0.65, 1.38)	0.56	0.97 (0.84, 1.11)	0.65
Pooled[4]	**1.15 (0.94, 1.41)**	**0.91 (0.74, 1.13)**	**0.96 (0.78, 1.19)**	**0.95 (0.77, 1.18)**	**0.31**	**0.96 (0.89, 1.04)**	**0.32**
Tyrosine							
NHS	1.05 (0.80, 1.38)	1.06 (0.81, 1.40)	0.91 (0.69, 1.22)	0.94 (0.71, 1.25)	0.49	0.96 (0.86, 1.06)	0.41
NHSII	1.02 (0.53, 1.95)	1.35 (0.74, 2.48)	1.24 (0.66, 2.33)	0.80 (0.39, 1.61)	0.82	1.00 (0.79, 1.28)	0.98
HPFS	1.15 (0.81, 1.64)	0.88 (0.60, 1.28)	1.06 (0.74, 1.53)	0.91 (0.62, 1.33)	0.53	0.97 (0.85, 1.12)	0.70
Pooled[4]	**1.08 (0.88, 1.33)**	**1.03 (0.84, 1.27)**	**1.00 (0.81, 1.23)**	**0.92 (0.74, 1.14)**	**0.34**	**0.97 (0.89, 1.05)**	**0.41**
Hydroxyproline							
NHS	1.03 (0.78, 1.37)	1.15 (0.87, 1.52)	1.03 (0.77, 1.38)	1.13 (0.85, 1.50)	0.46	1.04 (0.93, 1.17)	0.47
NHSII	1.36 (0.71, 2.62)	1.42 (0.75, 2.71)	1.26 (0.64, 2.46)	0.95 (0.46, 1.94)	0.79	0.97 (0.77, 1.23)	0.83
HPFS	1.00 (0.71, 1.42)	0.87 (0.60, 1.24)	0.78 (0.53, 1.14)	1.00 (0.70, 1.44)	0.71	0.99 (0.86, 1.13)	0.84
Pooled[4]	**1.05 (0.85, 1.29)**	**1.07 (0.87, 1.32)**	**0.96 (0.77, 1.20)**	**1.07 (0.86, 1.32)**	**0.88**	**1.01 (0.93, 1.10)**	**0.75**
Taurine							
NHS	1.06 (0.80, 1.39)	0.99 (0.75, 1.31)	0.90 (0.68, 1.20)	0.99 (0.75, 1.30)	0.61	0.94 (0.84, 1.06)	0.32

NHSII	1.43 (0.75, 2.74)	1.18 (0.59, 2.34)	1.21 (0.62, 2.34)	1.25 (0.65, 2.43)	0.70	1.03 (0.80, 1.33)	0.81
HPFS	1.00 (0.70, 1.45)	0.97 (0.67, 1.41)	0.96 (0.66, 1.39)	1.04 (0.72, 1.49)	0.96	1.01 (0.89, 1.15)	0.83
Pooled[4]	**1.07 (0.87, 1.32)**	**1.00 (0.81, 1.24)**	**0.95 (0.77, 1.18)**	**1.03 (0.83, 1.27)**	**0.87**	**0.98 (0.90, 1.06)**	**0.61**

1. Analyses were stratified by age (in years) and follow-up intervals, and adjusted for ethnicity (white, non-white), marital status (married, widowed, divorced/separated, unknown), smoking status (never, past, current: 1–14, 15–24, ≥25 cigarettes/day, unknown status or cigarette number), alcohol intake (never drinkers, 0.1-4.9, 5.0-9.9, 10.0-14.9, 15.0+ g/d), physical activity (<3, 3–9, 9–18, 18–27, 27–42, ≥42 metabolic equivalents/week, unknown), menopausal status and postmenopausal hormone use (premenopausal, postmenopausal: never, past, current users, NHS and NHSII only), oral contraception use (never, past, current user, NHSII only), multivitamin use (no, yes), aspirin use (no, yes), body mass index (<23, 23–24.9, 25–29.9, 30–34.9, ≥35 kg/m^2, missing), baseline history of hypertension (no, yes), baseline hypercholesteremia (no, yes), baseline diabetes (no, yes), and energy intake (fifths of intake).
2. Linear trends estimated by fitting the median values in each fifth of intake as a pseudo-continuous variable in the Cox regression.
3. P-values estimated by fitting the continuous intakes of dietary amino acids in the Cox regression.
4. Results from NHS, NHSII and HPFS were pooled using a fixed-effects meta-analysis.

Supplementary table 7: Hazard ratios (95% confidence intervals) for total stroke (5997 cases) by fifths and per SD difference of energy-adjusted grams of dietary amino acids.

	HR (95% CI), fifths of intake compared to bottom fifth[1]						
Amino acids	**Q2**	**Q3**	**Q4**	**Q5**	***p*-trend[2]**	**HR (95% CI) per SD higher intake[1]**	***p*-value[3]**
Isoleucine							
NHS	0.99 (0.89, 1.10)	0.91 (0.82, 1.02)	0.94 (0.85, 1.05)	0.97 (0.87, 1.08)	0.44	0.97 (0.93, 1.02)	0.21
NHSII	1.23 (0.95, 1.58)	1.03 (0.79, 1.34)	0.85 (0.64, 1.12)	1.17 (0.91, 1.51)	0.78	1.00 (0.91, 1.10)	1.00
HPFS	0.91 (0.79, 1.04)	0.88 (0.77, 1.01)	0.94 (0.82, 1.07)	0.96 (0.84, 1.10)	0.75	0.99 (0.94, 1.04)	0.74
Pooled[4]	**0.98 (0.90, 1.06)**	**0.91 (0.84, 0.99)**	**0.93 (0.86, 1.01)**	**0.98 (0.91, 1.07)**	**0.53**	**0.98 (0.95, 1.01)**	**0.26**
Leucine							
NHS	0.99 (0.89, 1.10)	0.92 (0.82, 1.02)	0.96 (0.86, 1.07)	0.96 (0.86, 1.07)	0.44	0.97 (0.93, 1.01)	0.16
NHSII	0.94 (0.73, 1.22)	1.07 (0.83, 1.38)	0.79 (0.60, 1.04)	1.04 (0.81, 1.33)	0.98	1.00 (0.91, 1.10)	0.97
HPFS	0.92 (0.81, 1.06)	0.87 (0.76, 1.00)	0.96 (0.84, 1.10)	0.99 (0.86, 1.13)	1.00	0.99 (0.94, 1.04)	0.69
Pooled[4]	**0.96 (0.89, 1.04)**	**0.92 (0.85, 1.00)**	**0.94 (0.87, 1.02)**	**0.98 (0.90, 1.06)**	**0.60**	**0.98 (0.95, 1.01)**	**0.21**
Valine							
NHS	0.99 (0.89, 1.10)	0.94 (0.84, 1.04)	0.96 (0.86, 1.07)	0.96 (0.86, 1.07)	0.39	0.97 (0.93, 1.01)	0.11
NHSII	0.98 (0.76, 1.27)	1.00 (0.78, 1.29)	0.80 (0.61, 1.05)	1.05 (0.82, 1.35)	0.97	1.00 (0.91, 1.10)	0.98
HPFS	0.95 (0.83, 1.09)	0.87 (0.76, 1.00)	0.95 (0.83, 1.08)	0.94 (0.82, 1.08)	0.42	0.99 (0.94, 1.04)	0.57
Pooled[4]	**0.98 (0.90, 1.06)**	**0.92 (0.85, 1.00)**	**0.94 (0.87, 1.02)**	**0.96 (0.89, 1.04)**	**0.27**	**0.98 (0.95, 1.01)**	**0.13**
Histidine							
NHS	0.96 (0.86, 1.06)	0.89 (0.79, 0.99)	0.98 (0.88, 1.09)	0.99 (0.89, 1.10)	0.94	0.98 (0.94, 1.03)	0.43
NHSII	0.99 (0.77, 1.29)	0.89 (0.68, 1.16)	1.03 (0.80, 1.33)	0.99 (0.77, 1.28)	0.96	0.99 (0.90, 1.09)	0.82
HPFS	0.87 (0.76, 0.99)	0.89 (0.77, 1.02)	0.96 (0.83, 1.09)	1.01 (0.88, 1.15)	0.60	1.01 (0.96, 1.06)	0.78
Pooled[4]	**0.93 (0.86, 1.01)**	**0.89 (0.82, 0.96)**	**0.97 (0.90, 1.05)**	**0.99 (0.92, 1.07)**	**0.75**	**0.99 (0.96, 1.02)**	**0.63**
Lysine							
NHS	0.97 (0.87, 1.07)	0.92 (0.83, 1.03)	0.95 (0.85, 1.06)	0.99 (0.89, 1.10)	0.82	0.98 (0.94, 1.03)	0.44
NHSII	1.05 (0.81, 1.36)	1.04 (0.80, 1.34)	0.89 (0.68, 1.17)	1.09 (0.85, 1.40)	0.77	1.00 (0.91, 1.10)	0.99
HPFS	0.98 (0.86, 1.12)	0.89 (0.77, 1.02)	0.99 (0.86, 1.13)	1.04 (0.90, 1.19)	0.59	1.00 (0.95, 1.06)	0.86

Pooled[4]	**0.98 (0.90, 1.06)**	**0.92 (0.85, 1.00)**	**0.96 (0.88, 1.04)**	**1.01 (0.94, 1.10)**	**0.75**	**0.99 (0.96, 1.02)**	**0.64**
Methionine							
NHS	0.95 (0.85, 1.06)	0.88 (0.79, 0.98)	0.96 (0.86, 1.06)	0.97 (0.87, 1.08)	0.68	0.98 (0.94, 1.02)	0.29
NHSII	1.11 (0.86, 1.43)	1.06 (0.82, 1.38)	0.87 (0.66, 1.14)	1.06 (0.82, 1.36)	0.83	1.00 (0.90, 1.10)	0.97
HPFS	0.95 (0.83, 1.09)	0.92 (0.80, 1.05)	0.94 (0.82, 1.08)	1.02 (0.89, 1.17)	0.77	1.00 (0.95, 1.05)	0.97
Pooled[4]	**0.97 (0.89, 1.05)**	**0.91 (0.84, 0.99)**	**0.94 (0.87, 1.02)**	**1.00 (0.92, 1.08)**	**0.89**	**0.99 (0.96, 1.02)**	**0.42**
Phenylalanine							
NHS	0.96 (0.86, 1.07)	0.92 (0.83, 1.03)	0.93 (0.84, 1.04)	0.97 (0.87, 1.07)	0.48	0.96 (0.93, 1.01)	0.09
NHSII	0.91 (0.71, 1.18)	0.99 (0.77, 1.27)	0.71 (0.54, 0.93)	0.98 (0.77, 1.26)	0.55	0.98 (0.89, 1.08)	0.74
HPFS	0.87 (0.76, 1.00)	0.87 (0.76, 0.99)	0.89 (0.78, 1.02)	0.94 (0.82, 1.08)	0.45	0.99 (0.94, 1.04)	0.65
Pooled[4]	**0.92 (0.85, 1.00)**	**0.91 (0.84, 0.98)**	**0.90 (0.83, 0.97)**	**0.96 (0.88, 1.04)**	**0.24**	**0.97 (0.95, 1.01)**	**0.11**
Threonine							
NHS	0.98 (0.89, 1.10)	0.89 (0.80, 1.00)	0.99 (0.89, 1.10)	0.99 (0.89, 1.11)	0.98	0.99 (0.94, 1.03)	0.50
NHSII	1.11 (0.86, 1.44)	1.06 (0.82, 1.37)	0.84 (0.64, 1.11)	1.10 (0.85, 1.41)	0.97	0.99 (0.90, 1.09)	0.86
HPFS	0.94 (0.82, 1.08)	0.90 (0.78, 1.04)	0.97 (0.85, 1.11)	1.00 (0.87, 1.14)	0.89	1.00 (0.95, 1.05)	0.96
Pooled[4]	**0.98 (0.91, 1.06)**	**0.91 (0.84, 0.99)**	**0.97 (0.89, 1.05)**	**1.01 (0.93, 1.09)**	**0.90**	**0.99 (0.96, 1.02)**	**0.56**
Tryptophan							
NHS	1.06 (0.95, 1.18)	0.93 (0.83, 1.03)	1.01 (0.91, 1.13)	1.00 (0.90, 1.12)	0.85	0.98 (0.94, 1.02)	0.38
NHSII	1.22 (0.95, 1.58)	1.02 (0.79, 1.33)	0.86 (0.65, 1.14)	1.15 (0.89, 1.48)	0.82	1.00 (0.91, 1.10)	1.00
HPFS	0.88 (0.77, 1.01)	0.88 (0.76, 1.01)	0.92 (0.80, 1.05)	0.95 (0.83, 1.09)	0.61	0.99 (0.94, 1.04)	0.72
Pooled[4]	**1.01 (0.93, 1.09)**	**0.92 (0.84, 1.00)**	**0.96 (0.89, 1.05)**	**1.00 (0.92, 1.08)**	**0.70**	**0.99 (0.96, 1.02)**	**0.40**
Alanine							
NHS	0.95 (0.86, 1.06)	0.91 (0.82, 1.01)	0.99 (0.89, 1.11)	0.99 (0.89, 1.11)	0.82	1.00 (0.96, 1.04)	0.91
NHSII	0.85 (0.66, 1.11)	0.87 (0.67, 1.13)	0.95 (0.73, 1.22)	0.91 (0.71, 1.17)	0.67	0.98 (0.89, 1.08)	0.65
HPFS	0.87 (0.76, 1.00)	0.89 (0.78, 1.03)	0.97 (0.85, 1.12)	1.01 (0.88, 1.15)	0.52	1.01 (0.96, 1.06)	0.66
Pooled[4]	**0.92 (0.84, 0.99)**	**0.90 (0.83, 0.98)**	**0.98 (0.91, 1.06)**	**0.99 (0.91, 1.07)**	**0.66**	**1.00 (0.97, 1.03)**	**0.97**
Arginine							
NHS	0.94 (0.84, 1.04)	0.95 (0.85, 1.05)	0.94 (0.84, 1.05)	1.00 (0.90, 1.11)	0.93	1.00 (0.95, 1.04)	0.91

NHSII	0.91 (0.70, 1.18)	0.89 (0.68, 1.14)	0.84 (0.65, 1.09)	0.94 (0.73, 1.20)	0.54	0.96 (0.87, 1.06)	0.38
HPFS	0.90 (0.79, 1.03)	0.90 (0.79, 1.04)	1.02 (0.89, 1.17)	0.98 (0.86, 1.13)	0.74	1.02 (0.97, 1.07)	0.53
Pooled[4]	**0.92 (0.85, 1.00)**	**0.93 (0.85, 1.00)**	**0.96 (0.88, 1.04)**	**0.99 (0.91, 1.07)**	**0.93**	**1.00 (0.97, 1.03)**	**0.98**
Asparagine							
NHS	0.96 (0.86, 1.07)	0.95 (0.86, 1.06)	0.94 (0.85, 1.05)	0.97 (0.87, 1.08)	0.61	0.98 (0.94, 1.02)	0.32
NHSII	1.00 (0.78, 1.28)	0.93 (0.72, 1.20)	0.72 (0.55, 0.95)	0.99 (0.77, 1.26)	0.46	0.98 (0.89, 1.07)	0.61
HPFS	0.86 (0.75, 0.98)	0.88 (0.77, 1.01)	0.90 (0.78, 1.03)	0.93 (0.81, 1.06)	0.45	0.99 (0.94, 1.04)	0.73
Pooled[4]	**0.93 (0.85, 1.00)**	**0.93 (0.85, 1.00)**	**0.91 (0.83, 0.98)**	**0.96 (0.89, 1.04)**	**0.28**	**0.98 (0.95, 1.01)**	**0.27**
Aspartic acid							
NHS	0.94 (0.85, 1.05)	0.88 (0.78, 0.98)	0.96 (0.86, 1.07)	1.00 (0.90, 1.12)	0.67	1.00 (0.96, 1.05)	0.94
NHSII	0.88 (0.68, 1.14)	0.84 (0.64, 1.09)	0.84 (0.65, 1.09)	0.98 (0.77, 1.26)	0.93	0.98 (0.89, 1.08)	0.65
HPFS	0.95 (0.83, 1.09)	0.90 (0.78, 1.03)	0.92 (0.80, 1.06)	1.07 (0.94, 1.22)	0.39	1.02 (0.97, 1.07)	0.50
Pooled[4]	**0.94 (0.87, 1.02)**	**0.88 (0.81, 0.96)**	**0.94 (0.86, 1.01)**	**1.02 (0.95, 1.11)**	**0.41**	**1.01 (0.97, 1.04)**	**0.75**
Cystine							
NHS	0.94 (0.85, 1.04)	0.89 (0.80, 0.99)	0.89 (0.80, 0.99)	0.92 (0.83, 1.03)	0.09	0.96 (0.93, 1.00)	0.07
NHSII	1.02 (0.79, 1.30)	0.91 (0.70, 1.17)	0.87 (0.67, 1.13)	0.98 (0.76, 1.26)	0.61	0.98 (0.89, 1.07)	0.61
HPFS	0.82 (0.71, 0.94)	0.87 (0.76, 1.00)	0.96 (0.84, 1.10)	0.89 (0.78, 1.03)	0.47	0.99 (0.94, 1.04)	0.68
Pooled[4]	**0.90 (0.84, 0.98)**	**0.89 (0.82, 0.96)**	**0.91 (0.84, 0.99)**	**0.92 (0.85, 0.99)**	**0.08**	**0.97 (0.95, 1.00)**	**0.08**
Glutamine							
NHS	0.89 (0.80, 0.99)	0.92 (0.83, 1.02)	0.89 (0.80, 0.99)	0.85 (0.76, 0.95)	0.01	0.93 (0.90, 0.97)	0.00
NHSII	0.92 (0.72, 1.17)	0.89 (0.69, 1.14)	0.93 (0.73, 1.20)	0.78 (0.60, 1.02)	0.11	0.93 (0.85, 1.02)	0.13
HPFS	0.98 (0.86, 1.11)	0.82 (0.71, 0.94)	0.92 (0.80, 1.05)	0.91 (0.80, 1.05)	0.10	0.94 (0.89, 0.99)	0.02
Pooled[4]	**0.92 (0.85, 1.00)**	**0.88 (0.81, 0.95)**	**0.90 (0.83, 0.98)**	**0.87 (0.80, 0.94)**	**<0.001**	**0.94 (0.91, 0.97)**	**<0.001**
Glutamic acid							
NHS	0.94 (0.84, 1.04)	0.89 (0.80, 0.99)	0.92 (0.83, 1.02)	0.97 (0.87, 1.08)	0.60	0.98 (0.94, 1.02)	0.35
NHSII	1.10 (0.86, 1.42)	0.92 (0.70, 1.20)	0.91 (0.70, 1.19)	1.10 (0.85, 1.41)	0.75	1.00 (0.91, 1.11)	0.96
HPFS	0.87 (0.76, 0.99)	0.90 (0.78, 1.03)	0.91 (0.80, 1.05)	0.97 (0.84, 1.10)	0.87	1.00 (0.95, 1.05)	0.90
Pooled[4]	**0.93 (0.86, 1.00)**	**0.89 (0.82, 0.97)**	**0.92 (0.85, 0.99)**	**0.98 (0.91, 1.06)**	**0.71**	**0.99 (0.96, 1.02)**	**0.46**

Glycine							
NHS	0.92 (0.83, 1.03)	0.96 (0.86, 1.07)	0.98 (0.88, 1.09)	1.00 (0.90, 1.12)	0.59	1.01 (0.97, 1.05)	0.72
NHSII	0.92 (0.71, 1.20)	0.91 (0.70, 1.19)	0.98 (0.76, 1.27)	0.96 (0.74, 1.23)	0.85	0.98 (0.89, 1.08)	0.64
HPFS	0.83 (0.72, 0.95)	0.87 (0.76, 1.00)	1.01 (0.88, 1.15)	1.00 (0.88, 1.15)	0.30	1.02 (0.96, 1.07)	0.57
Pooled[4]	**0.89 (0.82, 0.96)**	**0.92 (0.85, 1.00)**	**0.99 (0.92, 1.07)**	**1.00 (0.92, 1.08)**	**0.32**	**1.01 (0.98, 1.04)**	**0.65**
Proline							
NHS	0.96 (0.87, 1.07)	0.83 (0.74, 0.93)	0.97 (0.88, 1.08)	0.88 (0.79, 0.98)	0.04	0.94 (0.91, 0.98)	0.01
NHSII	1.19 (0.93, 1.52)	0.95 (0.73, 1.23)	0.89 (0.68, 1.16)	1.12 (0.87, 1.45)	0.87	1.02 (0.93, 1.12)	0.69
HPFS	0.93 (0.82, 1.07)	0.94 (0.83, 1.08)	0.81 (0.71, 0.94)	0.88 (0.76, 1.01)	0.02	0.96 (0.91, 1.01)	0.10
Pooled[4]	**0.97 (0.90, 1.05)**	**0.88 (0.81, 0.96)**	**0.91 (0.84, 0.99)**	**0.90 (0.83, 0.98)**	**0.004**	**0.96 (0.93, 0.99)**	**0.004**
Serine							
NHS	0.94 (0.84, 1.04)	0.92 (0.83, 1.02)	0.93 (0.83, 1.03)	0.94 (0.85, 1.05)	0.32	0.96 (0.92, 1.00)	0.07
NHSII	1.01 (0.79, 1.29)	0.93 (0.72, 1.20)	0.88 (0.68, 1.14)	0.94 (0.73, 1.21)	0.49	0.99 (0.90, 1.09)	0.90
HPFS	0.90 (0.79, 1.03)	0.89 (0.78, 1.02)	0.90 (0.79, 1.04)	0.94 (0.82, 1.07)	0.37	0.99 (0.94, 1.04)	0.57
Pooled[4]	**0.93 (0.86, 1.01)**	**0.91 (0.84, 0.99)**	**0.91 (0.84, 0.99)**	**0.94 (0.87, 1.02)**	**0.13**	**0.97 (0.94, 1.00)**	**0.08**
Tyrosine							
NHS	0.95 (0.85, 1.05)	0.95 (0.85, 1.06)	0.95 (0.85, 1.06)	0.93 (0.84, 1.04)	0.26	0.97 (0.93, 1.01)	0.10
NHSII	0.99 (0.76, 1.28)	1.08 (0.84, 1.38)	0.82 (0.63, 1.08)	1.05 (0.82, 1.35)	0.93	1.00 (0.91, 1.10)	0.98
HPFS	0.97 (0.84, 1.10)	0.86 (0.75, 0.99)	0.95 (0.83, 1.09)	0.95 (0.83, 1.09)	0.48	0.98 (0.93, 1.03)	0.52
Pooled[4]	**0.96 (0.88, 1.04)**	**0.93 (0.86, 1.01)**	**0.94 (0.87, 1.02)**	**0.95 (0.88, 1.03)**	**0.24**	**0.98 (0.95, 1.01)**	**0.11**
Hydroxyproline							
NHS	0.98 (0.88, 1.09)	1.01 (0.91, 1.13)	1.03 (0.93, 1.15)	1.14 (1.03, 1.27)	0.004	1.06 (1.01, 1.10)	0.02
NHSII	0.89 (0.67, 1.17)	1.12 (0.86, 1.45)	0.92 (0.71, 1.21)	1.02 (0.79, 1.32)	0.92	1.02 (0.93, 1.12)	0.69
HPFS	1.04 (0.91, 1.20)	1.10 (0.95, 1.26)	1.03 (0.90, 1.19)	1.20 (1.04, 1.38)	0.01	1.05 (1.00, 1.11)	0.05
Pooled[4]	**0.99 (0.91, 1.07)**	**1.05 (0.97, 1.14)**	**1.02 (0.94, 1.11)**	**1.15 (1.06, 1.24)**	**<0.001**	**1.05 (1.02, 1.08)**	**0.002**
Taurine							
NHS	1.00 (0.90, 1.11)	0.93 (0.83, 1.03)	0.96 (0.86, 1.07)	1.02 (0.92, 1.14)	0.81	0.99 (0.95, 1.03)	0.62

NHSII	0.97 (0.75, 1.25)	0.80 (0.61, 1.05)	0.88 (0.69, 1.14)	1.01 (0.79, 1.29)	0.99	1.00 (0.91, 1.12)	0.93
HPFS	0.92 (0.80, 1.05)	0.94 (0.82, 1.07)	0.99 (0.86, 1.13)	1.03 (0.90, 1.17)	0.42	1.01 (0.96, 1.07)	0.57
Pooled[4]	**0.97 (0.89, 1.05)**	**0.92 (0.85, 1.00)**	**0.96 (0.88, 1.04)**	**1.02 (0.95, 1.11)**	**0.47**	**1.00 (0.97, 1.03)**	**0.98**

1. Analyses were stratified by age (in years) and follow-up intervals, and adjusted for ethnicity (white, non-white), marital status (married, widowed, divorced/separated, unknown), smoking status (never, past, current: 1–14, 15–24, ≥25 cigarettes/day, unknown status or cigarette number), alcohol intake (never drinkers, 0.1-4.9, 5.0-9.9, 10.0-14.9, 15.0+ g/d), physical activity (<3, 3–9, 9–18, 18–27, 27–42, ≥42 metabolic equivalents/week, unknown), menopausal status and postmenopausal hormone use (premenopausal, postmenopausal: never, past, current users, NHS and NHSII only), oral contraception use (never, past, current user, NHSII only), multivitamin use (no, yes), aspirin use (no, yes), body mass index (<23, 23–24.9, 25–29.9, 30–34.9, ≥35 kg/m^2, missing), baseline history of hypertension (no, yes), baseline hypercholesteremia (no, yes), baseline diabetes (no, yes), and energy intake (fifths of intake).
2. Linear trends estimated by fitting the median values in each fifth of intake as a pseudo-continuous variable in the Cox regression.
3. P-values estimated by fitting the continuous intakes of dietary amino acids in the Cox regression.
4. Results from NHS, NHSII and HPFS were pooled using a fixed-effects meta-analysis.

Supplementary table 8: Hazard ratios (95% confidence intervals) for ischemic stroke (3058 cases) by fifths and per SD difference of energy-adjusted grams of dietary amino acids, across different adjustment models.

	HR (95% CI), fifths of intake compared to bottom fifth[1]					HR (95% CI) per SD higher	
Amino acids	**Q2**	**Q3**	**Q4**	**Q5**	***p*-trend[2]**	**intake[1]**	***p*-value[3]**
Isoleucine							
Age-adjusted	0.90 (0.80, 1.00)	0.86 (0.77, 0.96)	0.87 (0.78, 0.98)	0.96 (0.86, 1.07)	0.38	0.98 (0.94, 1.03)	0.47
Multivariable 1	0.90 (0.81, 1.01)	0.86 (0.77, 0.97)	0.87 (0.78, 0.97)	0.91 (0.81, 1.01)	0.07	0.96 (0.92, 1.00)	0.06
Multivariable 2	0.91 (0.81, 1.01)	0.87 (0.77, 0.97)	0.88 (0.78, 0.98)	0.92 (0.82, 1.03)	0.13	0.96 (0.92, 1.01)	0.10
Leucine							
Age-adjusted	0.91 (0.81, 1.01)	0.87 (0.78, 0.97)	0.87 (0.78, 0.98)	0.98 (0.88, 1.09)	0.48	0.98 (0.94, 1.02)	0.41
Multivariable 1	0.92 (0.82, 1.03)	0.87 (0.78, 0.98)	0.87 (0.78, 0.97)	0.92 (0.83, 1.03)	0.10	0.96 (0.92, 1.00)	0.04
Multivariable 2	0.92 (0.83, 1.03)	0.88 (0.79, 0.99)	0.87 (0.78, 0.98)	0.93 (0.83, 1.05)	0.17	0.96 (0.92, 1.00)	0.08
Valine							
Age-adjusted	0.91 (0.81, 1.01)	0.87 (0.78, 0.97)	0.86 (0.77, 0.96)	0.95 (0.85, 1.05)	0.17	0.97 (0.93, 1.01)	0.20
Multivariable 1	0.92 (0.83, 1.03)	0.88 (0.79, 0.98)	0.86 (0.77, 0.96)	0.90 (0.81, 1.01)	0.04	0.95 (0.91, 1.00)	0.03
Multivariable 2	0.93 (0.83, 1.03)	0.88 (0.79, 0.99)	0.87 (0.77, 0.97)	0.92 (0.82, 1.03)	0.08	0.96 (0.92, 1.00)	0.06
Histidine							
Age-adjusted	0.88 (0.78, 0.98)	0.85 (0.76, 0.95)	0.90 (0.81, 1.01)	1.03 (0.93, 1.15)	0.52	1.01 (0.96, 1.05)	0.77
Multivariable 1	0.88 (0.79, 0.99)	0.85 (0.76, 0.95)	0.89 (0.80, 1.00)	0.95 (0.85, 1.06)	0.43	0.97 (0.93, 1.01)	0.13
Multivariable 2	0.89 (0.79, 0.99)	0.85 (0.76, 0.95)	0.90 (0.80, 1.00)	0.96 (0.86, 1.08)	0.60	0.97 (0.93, 1.02)	0.20
Lysine							
Age-adjusted	0.89 (0.80, 0.99)	0.87 (0.78, 0.98)	0.91 (0.81, 1.02)	0.99 (0.89, 1.11)	0.97	1.00 (0.96, 1.05)	0.90
Multivariable 1	0.89 (0.80, 1.00)	0.86 (0.77, 0.97)	0.89 (0.80, 1.00)	0.92 (0.82, 1.02)	0.15	0.96 (0.92, 1.01)	0.11
Multivariable 2	0.89 (0.80, 1.00)	0.87 (0.77, 0.97)	0.90 (0.80, 1.00)	0.93 (0.83, 1.04)	0.24	0.97 (0.93, 1.01)	0.17
Methionine							
Age-adjusted	0.90 (0.81, 1.01)	0.89 (0.79, 0.99)	0.88 (0.78, 0.98)	1.01 (0.91, 1.12)	0.88	0.99 (0.95, 1.04)	0.77
Multivariable 1	0.90 (0.81, 1.01)	0.88 (0.79, 0.99)	0.86 (0.77, 0.97)	0.93 (0.84, 1.04)	0.16	0.96 (0.92, 1.00)	0.06
Multivariable 2	0.91 (0.81, 1.01)	0.89 (0.79, 0.99)	0.87 (0.78, 0.98)	0.95 (0.85, 1.06)	0.27	0.96 (0.92, 1.01)	0.11

Phenylalanine							
Age-adjusted	0.87 (0.78, 0.97)	0.84 (0.75, 0.94)	0.85 (0.76, 0.95)	0.95 (0.85, 1.06)	0.25	0.97 (0.93, 1.01)	0.18
Multivariable 1	0.88 (0.79, 0.99)	0.85 (0.76, 0.95)	0.85 (0.76, 0.96)	0.91 (0.81, 1.01)	0.07	0.95 (0.91, 0.99)	0.03
Multivariable 2	0.89 (0.79, 0.99)	0.86 (0.77, 0.96)	0.86 (0.77, 0.97)	0.92 (0.82, 1.03)	0.14	0.96 (0.92, 1.00)	0.06
Threonine							
Age-adjusted	0.93 (0.84, 1.04)	0.85 (0.76, 0.95)	0.94 (0.84, 1.04)	1.02 (0.92, 1.14)	0.75	1.00 (0.96, 1.04)	0.95
Multivariable 1	0.94 (0.84, 1.05)	0.86 (0.76, 0.96)	0.93 (0.83, 1.04)	0.95 (0.85, 1.06)	0.37	0.96 (0.92, 1.01)	0.11
Multivariable 2	0.95 (0.85, 1.06)	0.86 (0.77, 0.97)	0.93 (0.83, 1.05)	0.97 (0.86, 1.08)	0.56	0.97 (0.93, 1.01)	0.18
Tryptophan							
Age-adjusted	0.96 (0.86, 1.08)	0.83 (0.74, 0.93)	0.91 (0.81, 1.02)	0.98 (0.88, 1.09)	0.42	0.98 (0.94, 1.03)	0.48
Multivariable 1	0.98 (0.88, 1.10)	0.84 (0.75, 0.95)	0.92 (0.82, 1.03)	0.93 (0.83, 1.04)	0.11	0.96 (0.92, 1.00)	0.07
Multivariable 2	0.99 (0.88, 1.10)	0.85 (0.76, 0.95)	0.93 (0.83, 1.04)	0.94 (0.84, 1.06)	0.20	0.97 (0.92, 1.01)	0.13
Alanine							
Age-adjusted	0.85 (0.76, 0.95)	0.88 (0.78, 0.98)	0.92 (0.82, 1.02)	1.01 (0.91, 1.13)	0.55	1.01 (0.97, 1.06)	0.59
Multivariable 1	0.86 (0.77, 0.96)	0.88 (0.78, 0.98)	0.90 (0.81, 1.01)	0.94 (0.84, 1.05)	0.46	0.97 (0.93, 1.02)	0.24
Multivariable 2	0.86 (0.77, 0.96)	0.88 (0.79, 0.99)	0.91 (0.81, 1.02)	0.95 (0.85, 1.07)	0.68	0.98 (0.94, 1.02)	0.36
Arginine							
Age-adjusted	0.86 (0.77, 0.96)	0.85 (0.76, 0.95)	0.89 (0.80, 1.00)	0.98 (0.88, 1.09)	0.82	1.00 (0.96, 1.05)	0.84
Multivariable 1	0.87 (0.78, 0.97)	0.85 (0.76, 0.95)	0.89 (0.80, 0.99)	0.92 (0.82, 1.02)	0.19	0.97 (0.93, 1.02)	0.22
Multivariable 2	0.87 (0.78, 0.98)	0.86 (0.77, 0.96)	0.90 (0.80, 1.01)	0.93 (0.83, 1.05)	0.37	0.98 (0.94, 1.03)	0.39
Asparagine							
Age-adjusted	0.87 (0.77, 0.97)	0.83 (0.75, 0.93)	0.86 (0.77, 0.96)	0.93 (0.84, 1.04)	0.20	0.97 (0.93, 1.02)	0.23
Multivariable 1	0.89 (0.79, 0.99)	0.85 (0.76, 0.96)	0.89 (0.79, 0.99)	0.91 (0.82, 1.02)	0.14	0.96 (0.92, 1.01)	0.10
Multivariable 2	0.89 (0.80, 1.00)	0.86 (0.77, 0.97)	0.90 (0.80, 1.01)	0.93 (0.83, 1.05)	0.31	0.97 (0.93, 1.02)	0.23
Aspartic acid							
Age-adjusted	0.90 (0.80, 1.00)	0.85 (0.76, 0.96)	0.91 (0.82, 1.02)	1.06 (0.95, 1.18)	0.25	1.03 (0.98, 1.07)	0.23
Multivariable 1	0.89 (0.80, 1.00)	0.84 (0.75, 0.94)	0.89 (0.79, 0.99)	0.95 (0.85, 1.07)	0.52	0.98 (0.93, 1.02)	0.32
Multivariable 2	0.90 (0.80, 1.01)	0.85 (0.76, 0.95)	0.90 (0.80, 1.01)	0.97 (0.87, 1.09)	0.80	0.98 (0.94, 1.03)	0.51

Cystine							
Age-adjusted	0.89 (0.80, 0.99)	0.81 (0.72, 0.90)	0.87 (0.78, 0.97)	0.90 (0.81, 1.01)	0.05	0.97 (0.93, 1.01)	0.12
Multivariable 1	0.91 (0.82, 1.02)	0.83 (0.75, 0.93)	0.89 (0.80, 1.00)	0.90 (0.80, 1.00)	0.06	0.97 (0.93, 1.01)	0.11
Multivariable 2	0.92 (0.82, 1.02)	0.84 (0.75, 0.94)	0.90 (0.81, 1.01)	0.91 (0.81, 1.02)	0.13	0.97 (0.93, 1.02)	0.22
Glutamine							
Age-adjusted	0.84 (0.76, 0.94)	0.79 (0.71, 0.88)	0.79 (0.71, 0.89)	0.82 (0.73, 0.91)	<0.001	0.92 (0.88, 0.96)	<0.001
Multivariable 1	0.88 (0.79, 0.98)	0.84 (0.75, 0.93)	0.85 (0.76, 0.95)	0.86 (0.77, 0.97)	0.007	0.94 (0.90, 0.98)	0.004
Multivariable 2	0.88 (0.79, 0.98)	0.84 (0.75, 0.94)	0.85 (0.76, 0.96)	0.87 (0.78, 0.98)	0.02	0.94 (0.90, 0.99)	0.01
Glutamic acid							
Age-adjusted	0.86 (0.77, 0.96)	0.83 (0.74, 0.93)	0.83 (0.75, 0.93)	0.96 (0.87, 1.07)	0.48	0.99 (0.95, 1.04)	0.78
Multivariable 1	0.86 (0.77, 0.96)	0.83 (0.74, 0.93)	0.82 (0.73, 0.92)	0.90 (0.80, 1.00)	0.05	0.96 (0.92, 1.00)	0.06
Multivariable 2	0.86 (0.77, 0.97)	0.84 (0.75, 0.94)	0.83 (0.74, 0.93)	0.91 (0.81, 1.02)	0.10	0.96 (0.92, 1.01)	0.11
Glycine							
Age-adjusted	0.88 (0.79, 0.99)	0.89 (0.80, 1.00)	0.96 (0.86, 1.07)	1.05 (0.94, 1.17)	0.22	1.02 (0.98, 1.07)	0.33
Multivariable 1	0.88 (0.79, 0.99)	0.89 (0.80, 1.00)	0.94 (0.84, 1.05)	0.96 (0.86, 1.07)	0.80	0.98 (0.94, 1.02)	0.37
Multivariable 2	0.89 (0.79, 0.99)	0.90 (0.80, 1.01)	0.95 (0.85, 1.06)	0.98 (0.87, 1.09)	0.95	0.99 (0.94, 1.03)	0.52
Proline							
Age-adjusted	0.92 (0.82, 1.02)	0.83 (0.74, 0.93)	0.84 (0.75, 0.94)	0.88 (0.79, 0.98)	0.005	0.95 (0.91, 0.99)	0.015
Multivariable 1	0.94 (0.84, 1.04)	0.84 (0.75, 0.94)	0.84 (0.75, 0.95)	0.85 (0.76, 0.96)	0.002	0.94 (0.90, 0.98)	0.005
Multivariable 2	0.94 (0.84, 1.05)	0.84 (0.75, 0.94)	0.85 (0.76, 0.95)	0.86 (0.77, 0.97)	0.003	0.94 (0.91, 0.99)	0.009
Serine							
Age-adjusted	0.86 (0.77, 0.96)	0.84 (0.75, 0.94)	0.83 (0.74, 0.93)	0.93 (0.84, 1.04)	0.13	0.97 (0.93, 1.01)	0.14
Multivariable 1	0.88 (0.79, 0.98)	0.86 (0.77, 0.96)	0.84 (0.75, 0.94)	0.90 (0.80, 1.01)	0.04	0.95 (0.91, 0.99)	0.03
Multivariable 2	0.88 (0.79, 0.99)	0.87 (0.78, 0.97)	0.84 (0.75, 0.95)	0.91 (0.81, 1.02)	0.08	0.96 (0.92, 1.00)	0.06
Tyrosine							
Age-adjusted	0.90 (0.81, 1.00)	0.88 (0.78, 0.98)	0.86 (0.77, 0.96)	0.96 (0.86, 1.07)	0.28	0.97 (0.93, 1.02)	0.22
Multivariable 1	0.91 (0.81, 1.01)	0.88 (0.79, 0.98)	0.85 (0.76, 0.95)	0.90 (0.81, 1.01)	0.04	0.95 (0.91, 0.99)	0.01
Multivariable 2	0.91 (0.81, 1.01)	0.88 (0.79, 0.99)	0.85 (0.76, 0.96)	0.91 (0.82, 1.02)	0.07	0.95 (0.91, 0.99)	0.03

Hydroxyproline							
Age-adjusted	1.05 (0.94, 1.18)	1.12 (1.00, 1.26)	1.16 (1.04, 1.30)	1.38 (1.23, 1.54)	<0.001	1.13 (1.08, 1.17)	<0.001
Multivariable 1	1.00 (0.90, 1.13)	1.04 (0.92, 1.16)	1.04 (0.92, 1.16)	1.11 (0.99, 1.25)	0.04	1.02 (0.98, 1.07)	0.33
Multivariable 2	1.00 (0.89, 1.12)	1.03 (0.92, 1.16)	1.03 (0.91, 1.15)	1.10 (0.98, 1.23)	0.07	1.02 (0.97, 1.06)	0.47
Taurine							
Age-adjusted	0.91 (0.82, 1.02)	0.90 (0.80, 1.01)	0.90 (0.80, 1.01)	0.97 (0.87, 1.08)	0.52	1.00 (0.95, 1.04)	0.82
Multivariable 1	0.92 (0.82, 1.03)	0.90 (0.81, 1.01)	0.90 (0.80, 1.00)	0.94 (0.84, 1.05)	0.27	0.98 (0.94, 1.02)	0.32
Multivariable 2	0.92 (0.82, 1.03)	0.91 (0.81, 1.02)	0.91 (0.81, 1.02)	0.96 (0.86, 1.08)	0.50	0.99 (0.94, 1.03)	0.52

1 The age-adjusted model was stratified by age (in years) and follow-up intervals. The multivariable model 1 was additionally adjusted for ethnicity (white, non-white), marital status (married, widowed, divorced/separated, unknown), smoking status (never, past, current: 1–14, 15–24, ≥25 cigarettes/day, unknown status or cigarette number), alcohol intake (never drinkers, 0.1-4.9, 5.0-9.9, 10.0-14.9, 15.0+ g/d), physical activity (<3, 3–9, 9–18, 18–27, 27–42, ≥42 metabolic equivalents/week, unknown), menopausal status and postmenopausal hormone use (premenopausal, postmenopausal: never, past, current users, NHS and NHSII only), oral contraception use (never, past, current user, NHSII only), multivitamin use (no, yes), aspirin use (no, yes), body mass index (<23, 23–24.9, 25–29.9, 30–34.9, ≥35 kg/m^2, missing), baseline history of hypertension (no, yes), baseline hypercholesteremia (no, yes), baseline diabetes (no, yes), and energy intake (fifths of intake), and was considered the main model in these analyses. Multivariable model 2 additionally adjusted for the Alternative Healthy Eating Index (fifths of score). Results from NHS, NHSII and HPFS were pooled using a fixed-effects meta-analysis.

2 Linear trends estimated by fitting the median values in each fifth of intake as a pseudo-continuous variable in the Cox regression.

3 P-values estimated by fitting the continuous intakes of dietary amino acids in the Cox regression.

Supplementary table 9: Hazard ratios (95% confidence intervals) for hemorrhagic stroke (872 cases) by fifths and per SD difference of energy-adjusted grams of dietary amino acids, across different adjustment models.

	HR (95% CI), fifths of intake compared to bottom fifth[1]						
Amino acids	**Q2**	**Q3**	**Q4**	**Q5**	***p*-trend[2]**	**HR (95% CI) per SD higher intake[1]**	***p*-value[3]**
Isoleucine							
Age-adjusted	1.10 (0.90, 1.35)	0.92 (0.74, 1.13)	0.90 (0.73, 1.11)	0.92 (0.75, 1.14)	0.15	0.94 (0.87, 1.02)	0.16
Multivariable 1	1.17 (0.96, 1.44)	0.98 (0.79, 1.21)	0.97 (0.78, 1.20)	0.97 (0.78, 1.20)	0.34	0.96 (0.89, 1.04)	0.36
Multivariable 2	1.19 (0.97, 1.46)	1.00 (0.81, 1.24)	0.99 (0.80, 1.23)	1.01 (0.81, 1.26)	0.53	0.98 (0.90, 1.06)	0.58
Leucine							
Age-adjusted	1.11 (0.91, 1.36)	0.90 (0.73, 1.11)	0.97 (0.79, 1.20)	0.92 (0.74, 1.14)	0.24	0.95 (0.87, 1.02)	0.18
Multivariable 1	1.18 (0.96, 1.44)	0.96 (0.78, 1.19)	1.05 (0.85, 1.29)	0.97 (0.78, 1.20)	0.49	0.97 (0.89, 1.05)	0.40
Multivariable 2	1.19 (0.97, 1.46)	0.98 (0.79, 1.22)	1.07 (0.87, 1.33)	1.00 (0.80, 1.25)	0.69	0.98 (0.90, 1.06)	0.61
Valine							
Age-adjusted	1.05 (0.86, 1.29)	0.88 (0.72, 1.09)	0.91 (0.74, 1.12)	0.89 (0.73, 1.10)	0.15	0.94 (0.87, 1.02)	0.13
Multivariable 1	1.12 (0.92, 1.37)	0.95 (0.77, 1.17)	0.99 (0.80, 1.22)	0.95 (0.76, 1.17)	0.36	0.96 (0.89, 1.04)	0.34
Multivariable 2	1.14 (0.93, 1.39)	0.97 (0.78, 1.20)	1.01 (0.82, 1.26)	0.98 (0.79, 1.22)	0.57	0.98 (0.90, 1.06)	0.57
Histidine							
Age-adjusted	0.99 (0.81, 1.22)	0.90 (0.73, 1.11)	1.00 (0.82, 1.23)	0.89 (0.72, 1.09)	0.27	0.96 (0.88, 1.04)	0.31
Multivariable 1	1.04 (0.85, 1.28)	0.95 (0.77, 1.18)	1.07 (0.87, 1.31)	0.92 (0.74, 1.14)	0.46	0.97 (0.90, 1.06)	0.51
Multivariable 2	1.05 (0.86, 1.30)	0.97 (0.78, 1.20)	1.09 (0.88, 1.34)	0.95 (0.76, 1.18)	0.62	0.98 (0.91, 1.07)	0.71
Lysine							
Age-adjusted	1.02 (0.83, 1.25)	0.94 (0.77, 1.16)	0.96 (0.78, 1.18)	0.91 (0.73, 1.12)	0.27	0.96 (0.89, 1.04)	0.32
Multivariable 1	1.07 (0.88, 1.32)	1.00 (0.81, 1.23)	1.01 (0.82, 1.25)	0.94 (0.76, 1.16)	0.44	0.97 (0.90, 1.05)	0.49
Multivariable 2	1.09 (0.89, 1.33)	1.01 (0.82, 1.25)	1.04 (0.84, 1.28)	0.97 (0.78, 1.21)	0.63	0.98 (0.91, 1.07)	0.71
Methionine							
Age-adjusted	1.08 (0.89, 1.33)	0.87 (0.70, 1.07)	0.99 (0.81, 1.22)	0.92 (0.75, 1.14)	0.29	0.95 (0.87, 1.03)	0.20
Multivariable 1	1.14 (0.93, 1.40)	0.92 (0.74, 1.15)	1.06 (0.86, 1.30)	0.96 (0.77, 1.19)	0.49	0.96 (0.89, 1.04)	0.36
Multivariable 2	1.15 (0.94, 1.41)	0.94 (0.76, 1.17)	1.08 (0.88, 1.34)	0.99 (0.80, 1.24)	0.70	0.98 (0.90, 1.06)	0.56

Phenylalanine							
Age-adjusted	0.95 (0.78, 1.16)	0.88 (0.72, 1.08)	0.84 (0.68, 1.04)	0.88 (0.71, 1.08)	0.11	0.94 (0.87, 1.01)	0.11
Multivariable 1	1.01 (0.82, 1.24)	0.95 (0.77, 1.16)	0.91 (0.73, 1.12)	0.93 (0.75, 1.15)	0.30	0.96 (0.89, 1.04)	0.34
Multivariable 2	1.02 (0.83, 1.26)	0.97 (0.78, 1.19)	0.94 (0.75, 1.16)	0.97 (0.78, 1.21)	0.50	0.98 (0.90, 1.06)	0.58
Threonine							
Age-adjusted	1.06 (0.87, 1.30)	0.92 (0.75, 1.14)	0.99 (0.80, 1.21)	0.88 (0.71, 1.08)	0.16	0.95 (0.88, 1.03)	0.23
Multivariable 1	1.12 (0.91, 1.37)	0.98 (0.80, 1.22)	1.05 (0.85, 1.29)	0.91 (0.73, 1.13)	0.30	0.97 (0.89, 1.05)	0.41
Multivariable 2	1.13 (0.92, 1.39)	1.00 (0.81, 1.24)	1.07 (0.87, 1.33)	0.94 (0.75, 1.18)	0.46	0.98 (0.90, 1.06)	0.63
Tryptophan							
Age-adjusted	1.15 (0.94, 1.41)	0.99 (0.80, 1.22)	0.88 (0.71, 1.09)	0.96 (0.78, 1.18)	0.19	0.95 (0.87, 1.03)	0.19
Multivariable 1	1.23 (1.00, 1.51)	1.06 (0.86, 1.32)	0.95 (0.76, 1.19)	1.01 (0.81, 1.26)	0.42	0.97 (0.89, 1.05)	0.43
Multivariable 2	1.25 (1.02, 1.53)	1.09 (0.88, 1.35)	0.98 (0.79, 1.22)	1.05 (0.84, 1.31)	0.64	0.98 (0.90, 1.07)	0.68
Alanine							
Age-adjusted	0.94 (0.77, 1.16)	0.89 (0.72, 1.10)	1.03 (0.84, 1.26)	0.86 (0.70, 1.06)	0.28	0.96 (0.89, 1.05)	0.38
Multivariable 1	0.99 (0.80, 1.21)	0.95 (0.77, 1.17)	1.09 (0.89, 1.33)	0.89 (0.71, 1.10)	0.43	0.98 (0.90, 1.06)	0.57
Multivariable 2	1.00 (0.81, 1.23)	0.96 (0.78, 1.19)	1.11 (0.91, 1.37)	0.92 (0.73, 1.14)	0.63	0.99 (0.91, 1.08)	0.82
Arginine							
Age-adjusted	0.93 (0.76, 1.15)	1.00 (0.82, 1.23)	0.89 (0.72, 1.10)	0.89 (0.72, 1.09)	0.21	0.96 (0.89, 1.05)	0.39
Multivariable 1	0.98 (0.80, 1.21)	1.06 (0.87, 1.30)	0.95 (0.77, 1.18)	0.92 (0.74, 1.14)	0.37	0.98 (0.90, 1.06)	0.59
Multivariable 2	1.00 (0.81, 1.23)	1.09 (0.89, 1.34)	0.98 (0.79, 1.22)	0.96 (0.77, 1.20)	0.61	1.00 (0.91, 1.09)	0.93
Asparagine							
Age-adjusted	0.95 (0.77, 1.16)	0.91 (0.74, 1.12)	0.81 (0.66, 1.01)	0.82 (0.67, 1.01)	0.03	0.92 (0.85, 1.00)	0.05
Multivariable 1	1.00 (0.82, 1.23)	0.97 (0.79, 1.20)	0.88 (0.71, 1.09)	0.87 (0.70, 1.07)	0.10	0.94 (0.87, 1.02)	0.17
Multivariable 2	1.02 (0.83, 1.25)	1.00 (0.81, 1.23)	0.91 (0.73, 1.13)	0.90 (0.72, 1.13)	0.22	0.96 (0.88, 1.05)	0.38
Aspartic acid							
Age-adjusted	0.97 (0.79, 1.18)	0.87 (0.70, 1.07)	0.91 (0.74, 1.12)	0.92 (0.75, 1.13)	0.33	0.97 (0.89, 1.05)	0.47
Multivariable 1	1.01 (0.82, 1.23)	0.91 (0.74, 1.12)	0.96 (0.78, 1.19)	0.94 (0.76, 1.16)	0.43	0.97 (0.90, 1.06)	0.55
Multivariable 2	1.02 (0.83, 1.26)	0.93 (0.75, 1.15)	1.00 (0.80, 1.23)	0.98 (0.79, 1.22)	0.68	0.99 (0.91, 1.08)	0.85

Cystine							
Age-adjusted	0.89 (0.73, 1.09)	0.86 (0.70, 1.05)	0.84 (0.69, 1.04)	0.79 (0.64, 0.98)	0.03	0.91 (0.85, 0.99)	0.02
Multivariable 1	0.94 (0.77, 1.16)	0.92 (0.75, 1.14)	0.92 (0.75, 1.13)	0.85 (0.69, 1.06)	0.15	0.95 (0.87, 1.02)	0.16
Multivariable 2	0.96 (0.78, 1.18)	0.94 (0.76, 1.16)	0.95 (0.76, 1.17)	0.88 (0.71, 1.10)	0.28	0.96 (0.88, 1.04)	0.32
Glutamine							
Age-adjusted	0.91 (0.75, 1.11)	0.88 (0.72, 1.08)	0.74 (0.60, 0.92)	0.81 (0.66, 0.99)	0.01	0.87 (0.80, 0.94)	0.001
Multivariable 1	0.97 (0.80, 1.19)	0.96 (0.79, 1.18)	0.81 (0.65, 1.01)	0.88 (0.71, 1.10)	0.11	0.91 (0.83, 0.98)	0.02
Multivariable 2	0.99 (0.80, 1.21)	0.98 (0.80, 1.21)	0.83 (0.67, 1.04)	0.91 (0.73, 1.14)	0.19	0.91 (0.84, 1.00)	0.04
Glutamic acid							
Age-adjusted	0.99 (0.81, 1.22)	0.92 (0.74, 1.13)	0.95 (0.78, 1.17)	0.90 (0.73, 1.11)	0.30	0.96 (0.88, 1.04)	0.28
Multivariable 1	1.04 (0.85, 1.28)	0.97 (0.79, 1.20)	1.01 (0.82, 1.25)	0.93 (0.75, 1.15)	0.48	0.97 (0.89, 1.05)	0.42
Multivariable 2	1.06 (0.86, 1.30)	0.99 (0.80, 1.23)	1.05 (0.85, 1.30)	0.97 (0.78, 1.21)	0.74	0.98 (0.90, 1.07)	0.68
Glycine							
Age-adjusted	0.84 (0.68, 1.04)	0.88 (0.72, 1.08)	0.96 (0.79, 1.18)	0.85 (0.69, 1.05)	0.28	0.98 (0.91, 1.07)	0.69
Multivariable 1	0.88 (0.71, 1.08)	0.93 (0.75, 1.14)	1.01 (0.82, 1.24)	0.87 (0.70, 1.08)	0.38	0.99 (0.91, 1.08)	0.85
Multivariable 2	0.89 (0.72, 1.09)	0.95 (0.77, 1.17)	1.03 (0.84, 1.27)	0.90 (0.72, 1.12)	0.55	1.01 (0.93, 1.09)	0.88
Proline							
Age-adjusted	0.98 (0.80, 1.20)	0.83 (0.67, 1.02)	0.77 (0.62, 0.95)	0.93 (0.76, 1.14)	0.16	0.94 (0.87, 1.01)	0.09
Multivariable 1	1.05 (0.85, 1.28)	0.89 (0.72, 1.10)	0.84 (0.67, 1.04)	0.99 (0.81, 1.23)	0.46	0.96 (0.89, 1.04)	0.33
Multivariable 2	1.06 (0.86, 1.30)	0.91 (0.73, 1.12)	0.85 (0.68, 1.06)	1.02 (0.83, 1.26)	0.62	0.97 (0.90, 1.05)	0.48
Serine							
Age-adjusted	1.08 (0.89, 1.32)	0.85 (0.69, 1.05)	0.88 (0.72, 1.09)	0.90 (0.73, 1.11)	0.10	0.94 (0.86, 1.01)	0.10
Multivariable 1	1.15 (0.94, 1.41)	0.91 (0.74, 1.13)	0.96 (0.78, 1.19)	0.95 (0.77, 1.18)	0.31	0.96 (0.89, 1.04)	0.32
Multivariable 2	1.17 (0.96, 1.43)	0.93 (0.75, 1.16)	0.99 (0.79, 1.23)	0.99 (0.79, 1.24)	0.49	0.97 (0.90, 1.06)	0.55
Tyrosine							
Age-adjusted	1.02 (0.83, 1.25)	0.97 (0.79, 1.19)	0.93 (0.75, 1.14)	0.87 (0.71, 1.08)	0.15	0.95 (0.88, 1.03)	0.19
Multivariable 1	1.08 (0.88, 1.33)	1.03 (0.84, 1.27)	1.00 (0.81, 1.23)	0.92 (0.74, 1.14)	0.34	0.97 (0.89, 1.05)	0.41
Multivariable 2	1.09 (0.89, 1.34)	1.05 (0.85, 1.30)	1.02 (0.82, 1.27)	0.95 (0.76, 1.18)	0.51	0.98 (0.90, 1.06)	0.63

Hydroxyproline							
Age-adjusted	1.04 (0.85, 1.28)	1.07 (0.87, 1.32)	0.98 (0.79, 1.21)	1.14 (0.93, 1.40)	0.42	1.05 (0.96, 1.13)	0.28
Multivariable 1	1.05 (0.85, 1.29)	1.07 (0.87, 1.32)	0.96 (0.77, 1.20)	1.07 (0.86, 1.32)	0.88	1.01 (0.93, 1.10)	0.75
Multivariable 2	1.04 (0.85, 1.29)	1.06 (0.86, 1.31)	0.95 (0.76, 1.18)	1.05 (0.84, 1.30)	0.97	1.00 (0.92, 1.09)	0.94
Taurine							
Age-adjusted	1.04 (0.85, 1.28)	0.95 (0.77, 1.18)	0.90 (0.73, 1.12)	0.99 (0.81, 1.22)	0.61	0.97 (0.89, 1.05)	0.43
Multivariable 1	1.07 (0.87, 1.32)	1.00 (0.81, 1.24)	0.95 (0.77, 1.18)	1.03 (0.83, 1.27)	0.87	0.98 (0.90, 1.06)	0.61
Multivariable 2	1.09 (0.89, 1.34)	1.03 (0.83, 1.28)	0.99 (0.79, 1.23)	1.08 (0.87, 1.35)	0.78	1.00 (0.92, 1.09)	0.96

1. The age-adjusted model was stratified by age (in years) and follow-up intervals. The multivariable model 1 was additionally adjusted for ethnicity (white, non-white), marital status (married, widowed, divorced/separated, unknown), smoking status (never, past, current: 1–14, 15–24, ≥25 cigarettes/day, unknown status or cigarette number), alcohol intake (never drinkers, 0.1-4.9, 5.0-9.9, 10.0-14.9, 15.0+ g/d), physical activity (<3, 3–9, 9–18, 18–27, 27–42, ≥42 metabolic equivalents/week, unknown), menopausal status and postmenopausal hormone use (premenopausal, postmenopausal: never, past, current users, NHS and NHSII only), oral contraception use (never, past, current user, NHSII only), multivitamin use (no, yes), aspirin use (no, yes), body mass index (<23, 23–24.9, 25–29.9, 30–34.9, ≥35 kg/m^2, missing), baseline history of hypertension (no, yes), baseline hypercholesteremia (no, yes), baseline diabetes (no, yes), and energy intake (fifths of intake), and was considered the main model in these analyses. Multivariable model 2 additionally adjusted for the Alternative Healthy Eating Index (fifths of score). Results from NHS, NHSII and HPFS were pooled using a fixed-effects meta-analysis.
2. Linear trends estimated by fitting the median values in each fifth of intake as a pseudo-continuous variable in the Cox regression.
3. P-values estimated by fitting the continuous intakes of dietary amino acids in the Cox regression.

Supplementary table 10: Hazard ratios (95% confidence intervals) for total stroke (5997 cases) by fifths and per SD difference of energy-adjusted grams of dietary amino acids, across different adjustment models.

	HR (95% CI), fifths of intake compared to bottom fifth[1]						
Amino acids	**Q2**	**Q3**	**Q4**	**Q5**	***p*-trend[2]**	**HR (95% CI) per SD higher intake[1]**	***p*-value[3]**
Isoleucine							
Age-adjusted	0.95 (0.88, 1.03)	0.88 (0.82, 0.96)	0.91 (0.84, 0.99)	1.02 (0.94, 1.10)	0.82	1.00 (0.97, 1.03)	0.96
Multivariable 1	0.98 (0.90, 1.06)	0.91 (0.84, 0.99)	0.93 (0.86, 1.01)	0.98 (0.91, 1.07)	0.53	0.98 (0.95, 1.01)	0.26
Multivariable 2	0.99 (0.91, 1.07)	0.92 (0.85, 1.00)	0.95 (0.88, 1.03)	1.01 (0.93, 1.10)	0.94	0.99 (0.96, 1.03)	0.68
Leucine							
Age-adjusted	0.93 (0.86, 1.01)	0.89 (0.82, 0.96)	0.92 (0.85, 1.00)	1.01 (0.94, 1.09)	0.75	1.00 (0.97, 1.03)	0.89
Multivariable 1	0.96 (0.89, 1.04)	0.92 (0.85, 1.00)	0.94 (0.87, 1.02)	0.98 (0.90, 1.06)	0.60	0.98 (0.95, 1.01)	0.21
Multivariable 2	0.97 (0.89, 1.05)	0.93 (0.86, 1.01)	0.96 (0.89, 1.04)	1.00 (0.93, 1.09)	0.90	0.99 (0.96, 1.02)	0.54
Valine							
Age-adjusted	0.94 (0.87, 1.02)	0.89 (0.82, 0.96)	0.91 (0.84, 0.99)	0.99 (0.91, 1.07)	0.56	0.99 (0.96, 1.02)	0.46
Multivariable 1	0.98 (0.90, 1.06)	0.92 (0.85, 1.00)	0.94 (0.87, 1.02)	0.96 (0.89, 1.04)	0.27	0.98 (0.95, 1.01)	0.13
Multivariable 2	0.99 (0.91, 1.07)	0.93 (0.86, 1.01)	0.96 (0.88, 1.04)	0.99 (0.91, 1.08)	0.71	0.99 (0.96, 1.02)	0.44
Histidine							
Age-adjusted	0.90 (0.83, 0.98)	0.86 (0.80, 0.94)	0.96 (0.89, 1.04)	1.05 (0.97, 1.14)	0.07	1.02 (0.99, 1.05)	0.15
Multivariable 1	0.93 (0.86, 1.01)	0.89 (0.82, 0.96)	0.97 (0.90, 1.05)	0.99 (0.92, 1.07)	0.75	0.99 (0.96, 1.02)	0.63
Multivariable 2	0.93 (0.86, 1.01)	0.90 (0.83, 0.97)	0.99 (0.91, 1.07)	1.02 (0.94, 1.10)	0.38	1.00 (0.97, 1.03)	0.95
Lysine							
Age-adjusted	0.96 (0.88, 1.03)	0.91 (0.84, 0.98)	0.95 (0.88, 1.03)	1.07 (0.99, 1.16)	0.08	1.02 (0.99, 1.05)	0.16
Multivariable 1	0.98 (0.90, 1.06)	0.92 (0.85, 1.00)	0.96 (0.88, 1.04)	1.01 (0.94, 1.10)	0.75	0.99 (0.96, 1.02)	0.64
Multivariable 2	0.98 (0.91, 1.07)	0.93 (0.86, 1.01)	0.97 (0.90, 1.06)	1.04 (0.96, 1.13)	0.36	1.00 (0.97, 1.03)	0.90
Methionine							
Age-adjusted	0.94 (0.87, 1.02)	0.89 (0.82, 0.96)	0.93 (0.86, 1.01)	1.05 (0.97, 1.13)	0.25	1.01 (0.98, 1.05)	0.39
Multivariable 1	0.97 (0.89, 1.05)	0.91 (0.84, 0.99)	0.94 (0.87, 1.02)	1.00 (0.92, 1.08)	0.89	0.99 (0.96, 1.02)	0.42
Multivariable 2	0.97 (0.90, 1.05)	0.92 (0.85, 1.00)	0.96 (0.89, 1.04)	1.02 (0.94, 1.11)	0.61	1.00 (0.97, 1.03)	0.86

Phenylalanine							
Age-adjusted	0.89 (0.82, 0.96)	0.87 (0.81, 0.95)	0.87 (0.80, 0.94)	0.98 (0.91, 1.06)	0.50	0.99 (0.96, 1.02)	0.35
Multivariable 1	0.92 (0.85, 1.00)	0.91 (0.84, 0.98)	0.90 (0.83, 0.97)	0.96 (0.88, 1.04)	0.24	0.97 (0.95, 1.01)	0.11
Multivariable 2	0.93 (0.86, 1.01)	0.92 (0.85, 1.00)	0.92 (0.85, 1.00)	0.99 (0.91, 1.07)	0.71	0.99 (0.96, 1.02)	0.41
Threonine							
Age-adjusted	0.96 (0.88, 1.03)	0.89 (0.82, 0.96)	0.95 (0.88, 1.03)	1.06 (0.98, 1.14)	0.16	1.02 (0.99, 1.05)	0.27
Multivariable 1	0.98 (0.91, 1.06)	0.91 (0.84, 0.99)	0.97 (0.89, 1.05)	1.01 (0.93, 1.09)	0.90	0.99 (0.96, 1.02)	0.56
Multivariable 2	0.99 (0.91, 1.07)	0.92 (0.85, 1.00)	0.99 (0.91, 1.07)	1.03 (0.95, 1.12)	0.43	1.00 (0.97, 1.03)	0.94
Tryptophan							
Age-adjusted	0.97 (0.89, 1.05)	0.88 (0.82, 0.96)	0.93 (0.86, 1.01)	1.02 (0.95, 1.11)	0.73	1.00 (0.97, 1.04)	0.78
Multivariable 1	1.01 (0.93, 1.09)	0.92 (0.84, 1.00)	0.96 (0.89, 1.05)	1.00 (0.92, 1.08)	0.70	0.99 (0.96, 1.02)	0.40
Multivariable 2	1.02 (0.94, 1.10)	0.93 (0.86, 1.01)	0.99 (0.91, 1.07)	1.03 (0.94, 1.11)	0.73	1.00 (0.97, 1.03)	0.90
Alanine							
Age-adjusted	0.89 (0.82, 0.97)	0.88 (0.81, 0.95)	0.97 (0.90, 1.05)	1.05 (0.97, 1.13)	0.06	1.03 (1.00, 1.06)	0.05
Multivariable 1	0.92 (0.84, 0.99)	0.90 (0.83, 0.98)	0.98 (0.91, 1.06)	0.99 (0.91, 1.07)	0.66	1.00 (0.97, 1.03)	0.97
Multivariable 2	0.92 (0.85, 1.00)	0.91 (0.84, 0.99)	1.00 (0.92, 1.08)	1.02 (0.94, 1.10)	0.26	1.01 (0.98, 1.04)	0.49
Arginine							
Age-adjusted	0.90 (0.83, 0.97)	0.90 (0.83, 0.98)	0.94 (0.87, 1.02)	1.03 (0.96, 1.12)	0.21	1.03 (1.00, 1.06)	0.10
Multivariable 1	0.92 (0.85, 1.00)	0.93 (0.85, 1.00)	0.96 (0.88, 1.04)	0.99 (0.91, 1.07)	0.93	1.00 (0.97, 1.03)	0.98
Multivariable 2	0.93 (0.86, 1.01)	0.94 (0.87, 1.02)	0.98 (0.91, 1.07)	1.02 (0.94, 1.11)	0.33	1.02 (0.98, 1.05)	0.37
Asparagine							
Age-adjusted	0.89 (0.82, 0.96)	0.88 (0.82, 0.96)	0.86 (0.80, 0.93)	0.96 (0.89, 1.04)	0.25	0.99 (0.96, 1.02)	0.40
Multivariable 1	0.93 (0.85, 1.00)	0.93 (0.85, 1.00)	0.91 (0.83, 0.98)	0.96 (0.89, 1.04)	0.28	0.98 (0.95, 1.01)	0.27
Multivariable 2	0.94 (0.87, 1.02)	0.95 (0.87, 1.03)	0.93 (0.86, 1.01)	1.00 (0.92, 1.09)	1.00	1.00 (0.97, 1.03)	0.97
Aspartic acid							
Age-adjusted	0.92 (0.85, 1.00)	0.87 (0.80, 0.94)	0.94 (0.87, 1.01)	1.11 (1.03, 1.20)	0.004	1.05 (1.02, 1.08)	0.003
Multivariable 1	0.94 (0.87, 1.02)	0.88 (0.81, 0.96)	0.94 (0.86, 1.01)	1.02 (0.95, 1.11)	0.41	1.01 (0.97, 1.04)	0.75
Multivariable 2	0.95 (0.87, 1.03)	0.90 (0.83, 0.97)	0.96 (0.88, 1.04)	1.06 (0.98, 1.15)	0.09	1.02 (0.99, 1.05)	0.25

Cystine							
Age-adjusted	0.87 (0.80, 0.94)	0.84 (0.78, 0.91)	0.87 (0.80, 0.94)	0.90 (0.84, 0.98)	0.02	0.97 (0.94, 1.00)	0.03
Multivariable 1	0.90 (0.84, 0.98)	0.89 (0.82, 0.96)	0.91 (0.84, 0.99)	0.92 (0.85, 0.99)	0.08	0.97 (0.95, 1.00)	0.08
Multivariable 2	0.91 (0.84, 0.99)	0.90 (0.83, 0.98)	0.93 (0.86, 1.01)	0.95 (0.87, 1.03)	0.34	0.99 (0.96, 1.02)	0.36
Glutamine							
Age-adjusted	0.87 (0.81, 0.94)	0.82 (0.75, 0.88)	0.83 (0.77, 0.90)	0.81 (0.75, 0.88)	<0.001	0.91 (0.88, 0.94)	<0.001
Multivariable 1	0.92 (0.85, 1.00)	0.88 (0.81, 0.95)	0.90 (0.83, 0.98)	0.87 (0.80, 0.94)	<0.001	0.94 (0.91, 0.97)	<0.001
Multivariable 2	0.93 (0.86, 1.01)	0.89 (0.82, 0.97)	0.92 (0.85, 1.00)	0.89 (0.81, 0.96)	0.006	0.94 (0.91, 0.98)	<0.001
Glutamic acid							
Age-adjusted	0.90 (0.84, 0.98)	0.87 (0.80, 0.94)	0.90 (0.83, 0.98)	1.03 (0.95, 1.11)	0.38	1.02 (0.98, 1.05)	0.32
Multivariable 1	0.93 (0.86, 1.00)	0.89 (0.82, 0.97)	0.92 (0.85, 0.99)	0.98 (0.91, 1.06)	0.71	0.99 (0.96, 1.02)	0.46
Multivariable 2	0.94 (0.86, 1.01)	0.91 (0.84, 0.99)	0.94 (0.86, 1.02)	1.01 (0.93, 1.10)	0.68	1.00 (0.97, 1.03)	0.98
Glycine							
Age-adjusted	0.87 (0.81, 0.95)	0.90 (0.83, 0.98)	1.00 (0.92, 1.08)	1.07 (0.99, 1.16)	0.01	1.04 (1.01, 1.08)	0.01
Multivariable 1	0.89 (0.82, 0.96)	0.92 (0.85, 1.00)	0.99 (0.92, 1.07)	1.00 (0.92, 1.08)	0.32	1.01 (0.98, 1.04)	0.65
Multivariable 2	0.90 (0.83, 0.97)	0.93 (0.86, 1.01)	1.01 (0.93, 1.10)	1.03 (0.95, 1.11)	0.10	1.02 (0.99, 1.05)	0.28
Proline							
Age-adjusted	0.93 (0.86, 1.01)	0.85 (0.78, 0.92)	0.88 (0.81, 0.95)	0.90 (0.83, 0.97)	0.003	0.96 (0.93, 0.98)	0.003
Multivariable 1	0.97 (0.90, 1.05)	0.88 (0.81, 0.96)	0.91 (0.84, 0.99)	0.90 (0.83, 0.98)	0.004	0.96 (0.93, 0.99)	0.004
Multivariable 2	0.98 (0.91, 1.06)	0.89 (0.82, 0.97)	0.92 (0.85, 1.00)	0.92 (0.84, 1.00)	0.02	0.96 (0.93, 0.99)	0.02
Serine							
Age-adjusted	0.90 (0.83, 0.97)	0.87 (0.80, 0.94)	0.88 (0.82, 0.96)	0.95 (0.88, 1.03)	0.23	0.98 (0.95, 1.01)	0.21
Multivariable 1	0.93 (0.86, 1.01)	0.91 (0.84, 0.99)	0.91 (0.84, 0.99)	0.94 (0.87, 1.02)	0.13	0.97 (0.94, 1.00)	0.08
Multivariable 2	0.94 (0.87, 1.02)	0.93 (0.85, 1.00)	0.93 (0.86, 1.01)	0.97 (0.89, 1.05)	0.45	0.98 (0.95, 1.02)	0.33
Tyrosine							
Age-adjusted	0.93 (0.86, 1.01)	0.91 (0.84, 0.98)	0.92 (0.85, 1.00)	0.99 (0.91, 1.07)	0.75	0.99 (0.96, 1.02)	0.62
Multivariable 1	0.96 (0.88, 1.04)	0.93 (0.86, 1.01)	0.94 (0.87, 1.02)	0.95 (0.88, 1.03)	0.24	0.98 (0.95, 1.01)	0.11
Multivariable 2	0.96 (0.89, 1.04)	0.95 (0.87, 1.02)	0.96 (0.88, 1.04)	0.98 (0.90, 1.06)	0.59	0.98 (0.95, 1.02)	0.34

Hydroxyproline							
Age-adjusted	1.02 (0.94, 1.11)	1.11 (1.02, 1.20)	1.12 (1.03, 1.21)	1.39 (1.29, 1.50)	<0.001	1.15 (1.11, 1.18)	<0.001
Multivariable 1	0.99 (0.91, 1.07)	1.05 (0.97, 1.14)	1.02 (0.94, 1.11)	1.15 (1.06, 1.24)	<0.001	1.05 (1.02, 1.08)	0.002
Multivariable 2	0.98 (0.91, 1.07)	1.04 (0.96, 1.13)	1.01 (0.93, 1.10)	1.13 (1.04, 1.23)	0.001	1.04 (1.01, 1.08)	0.01
Taurine							
Age-adjusted	0.95 (0.87, 1.03)	0.90 (0.83, 0.97)	0.94 (0.87, 1.02)	1.04 (0.96, 1.12)	0.28	1.01 (0.98, 1.05)	0.38
Multivariable 1	0.97 (0.89, 1.05)	0.92 (0.85, 1.00)	0.96 (0.88, 1.04)	1.02 (0.95, 1.11)	0.47	1.00 (0.97, 1.03)	0.98
Multivariable 2	0.98 (0.90, 1.06)	0.94 (0.86, 1.02)	0.99 (0.91, 1.07)	1.07 (0.98, 1.16)	0.09	1.2 (0.98, 1.05)	0.37

1. The age-adjusted model was stratified by age (in years) and follow-up intervals. The multivariable model 1 was additionally adjusted for ethnicity (white, non-white), marital status (married, widowed, divorced/separated, unknown), smoking status (never, past, current: 1–14, 15–24, ≥25 cigarettes/day, unknown status or cigarette number), alcohol intake (never drinkers, 0.1-4.9, 5.0-9.9, 10.0-14.9, 15.0+ g/d), physical activity (<3, 3–9, 9–18, 18–27, 27–42, ≥42 metabolic equivalents/week, unknown), menopausal status and postmenopausal hormone use (premenopausal, postmenopausal: never, past, current users, NHS and NHSII only), oral contraception use (never, past, current user, NHSII only), multivitamin use (no, yes), aspirin use (no, yes), body mass index (<23, 23–24.9, 25–29.9, 30–34.9, ≥35 kg/m^2, missing), baseline history of hypertension (no, yes), baseline hypercholesteremia (no, yes), baseline diabetes (no, yes), and energy intake (fifths of intake), and was considered the main model in these analyses. Multivariable model 2 additionally adjusted for the Alternative Healthy Eating Index (fifths of score). Results from NHS, NHSII and HPFS were pooled using a fixed-effects meta-analysis.
2. Linear trends estimated by fitting the median values in each fifth of intake as a pseudo-continuous variable in the Cox regression.
3. P-values estimated by fitting the continuous intakes of dietary amino acids in the Cox regression.

Supplementary table 11: Hazard ratios (95% confidence intervals) for ischemic stroke (3058 cases) by fifths and per SD difference of raw grams of dietary amino acids.

	HR (95% CI), fifths of intake compared to bottom fifth[1]					HR (95% CI)	
Amino acids	**Q2**	**Q3**	**Q4**	**Q5**	***p*-trend[2]**	**per SD higher intake[1]**	***p*-value[3]**
Isoleucine	1.00 (0.89, 1.13)	1.03 (0.90, 1.18)	0.94 (0.81, 1.09)	0.87 (0.73, 1.03)	0.05	0.94 (0.88, 1.01)	0.07
Leucine	1.00 (0.88, 1.13)	1.02 (0.89, 1.17)	0.92 (0.79, 1.07)	0.91 (0.76, 1.08)	0.16	0.94 (0.88, 1.00)	0.06
Valine	1.02 (0.90, 1.15)	1.01 (0.88, 1.16)	0.91 (0.78, 1.06)	0.87 (0.73, 1.04)	0.05	0.93 (0.87, 1.00)	0.04
Histidine	0.95 (0.84, 1.07)	1.00 (0.88, 1.15)	0.93 (0.80, 1.08)	0.90 (0.76, 1.07)	0.19	0.95 (0.89, 1.02)	0.14
Lysine	0.95 (0.84, 1.07)	1.00 (0.88, 1.14)	0.89 (0.77, 1.03)	0.92 (0.78, 1.08)	0.24	0.95 (0.90, 1.01)	0.12
Methionine	0.96 (0.85, 1.09)	1.04 (0.91, 1.19)	0.94 (0.81, 1.09)	0.91 (0.77, 1.07)	0.22	0.95 (0.89, 1.01)	0.08
Phenylalanine	1.00 (0.89, 1.14)	1.00 (0.87, 1.15)	0.89 (0.76, 1.05)	0.87 (0.72, 1.04)	0.07	0.93 (0.87, 1.00)	0.04
Threonine	0.95 (0.84, 1.08)	1.01 (0.88, 1.16)	0.92 (0.79, 1.07)	0.90 (0.76, 1.07)	0.17	0.95 (0.89, 1.01)	0.13
Tryptophan	0.99 (0.87, 1.12)	1.05 (0.91, 1.20)	0.94 (0.80, 1.09)	0.94 (0.78, 1.12)	0.29	0.94 (0.88, 1.01)	0.09
Alanine	0.98 (0.87, 1.11)	1.02 (0.89, 1.17)	0.95 (0.82, 1.10)	0.97 (0.82, 1.14)	0.57	0.96 (0.90, 1.02)	0.21
Arginine	1.03 (0.91, 1.16)	1.09 (0.95, 1.25)	0.98 (0.84, 1.14)	1.00 (0.84, 1.18)	0.69	0.96 (0.89, 1.02)	0.17
Asparagine	0.98 (0.86, 1.11)	1.03 (0.90, 1.19)	0.95 (0.82, 1.11)	0.91 (0.76, 1.08)	0.20	0.95 (0.89, 1.01)	0.11
Aspartic acid	0.93 (0.82, 1.05)	1.03 (0.91, 1.18)	0.93 (0.81, 1.08)	0.96 (0.82, 1.13)	0.65	0.97 (0.91, 1.03)	0.31
Cystine	0.96 (0.85, 1.09)	1.01 (0.88, 1.17)	0.95 (0.81, 1.11)	0.85 (0.71, 1.02)	0.07	0.95 (0.89, 1.01)	0.12
Glutamine	1.12 (0.98, 1.27)	1.00 (0.86, 1.16)	0.95 (0.80, 1.12)	0.82 (0.68, 1.00)	0.02	0.91 (0.84, 0.98)	0.014
Glutamic acid	0.97 (0.86, 1.09)	0.98 (0.86, 1.12)	0.95 (0.82, 1.09)	0.90 (0.77, 1.06)	0.17	0.94 (0.89, 1.00)	0.07
Glycine	0.98 (0.87, 1.11)	0.97 (0.85, 1.11)	1.00 (0.86, 1.15)	0.97 (0.82, 1.15)	0.72	0.97 (0.91, 1.03)	0.31
Proline	1.00 (0.88, 1.13)	0.95 (0.83, 1.10)	0.95 (0.81, 1.11)	0.79 (0.66, 0.95)	0.009	0.92 (0.85, 0.98)	0.02
Serine	1.03 (0.90, 1.16)	1.00 (0.86, 1.15)	0.96 (0.82, 1.13)	0.87 (0.73, 1.05)	0.09	0.93 (0.87, 1.00)	0.04
Tyrosine	1.00 (0.89, 1.13)	1.00 (0.87, 1.15)	0.92 (0.78, 1.07)	0.85 (0.71, 1.01)	0.03	0.92 (0.86, 0.99)	0.02
Hydroxyproline	0.90 (0.80, 1.01)	0.94 (0.84, 1.06)	1.03 (0.91, 1.17)	1.07 (0.94, 1.22)	0.08	1.02 (0.97, 1.08)	0.44
Taurine	0.96 (0.86, 1.08)	0.88 (0.78, 1.00)	0.99 (0.88, 1.11)	0.90 (0.79, 1.02)	0.13	0.97 (0.93, 1.02)	0.25

1. Analyses were based on non-energy adjusted grams of intake of dietary amino acids. The model was stratified by age (in years) and follow-up intervals, and adjusted for ethnicity (white, non-white), marital status (married, widowed, divorced/separated, unknown), smoking status (never, past, current: 1–14, 15–24, ≥25 cigarettes/day, unknown status or cigarette number), alcohol intake (never drinkers, 0.1-4.9, 5.0-9.9, 10.0-14.9, 15.0+ g/d), physical activity (<3, 3–9, 9–18, 18–27, 27–42, ≥42

metabolic equivalents/week, unknown), menopausal status and postmenopausal hormone use (premenopausal, postmenopausal: never, past, current users, NHS and NHSII only), oral contraception use (never, past, current user, NHSII only), multivitamin use (no, yes), aspirin use (no, yes), body mass index (<23, 23–24.9, 25–29.9, 30–34.9, ≥35 kg/m^2, missing), baseline history of hypertension (no, yes), baseline hypercholesteremia (no, yes), baseline diabetes (no, yes), and energy intake (fifths of intake). Results from NHS, NHSII and HPFS were pooled using a fixed-effects meta-analysis.

2. Linear trends estimated by fitting the median values in each fifth of intake as a pseudo-continuous variable in the Cox regression.
3. P-values estimated by fitting the continuous intakes of dietary amino acids in the Cox regression.

Supplementary table 12: Hazard ratios (95% confidence intervals) for hemorrhagic stroke (872 cases) by fifths and per SD difference of raw grams of dietary amino acids.

	HR (95% CI), fifths of intake compared to bottom fifth[1]					HR (95% CI) per SD higher	
Amino acids	**Q2**	**Q3**	**Q4**	**Q5**	***p*-trend[2]**	**intake[1]**	***p*-value[3]**
Isoleucine	0.92 (0.74, 1.15)	0.82 (0.64, 1.05)	0.80 (0.61, 1.06)	0.77 (0.56, 1.06)	0.15	0.95 (0.84, 1.07)	0.37
Leucine	0.85 (0.68, 1.06)	0.80 (0.63, 1.03)	0.74 (0.56, 0.98)	0.74 (0.53, 1.02)	0.10	0.95 (0.83, 1.08)	0.40
Valine	0.87 (0.69, 1.08)	0.80 (0.62, 1.03)	0.77 (0.58, 1.02)	0.75 (0.54, 1.04)	0.14	0.94 (0.83, 1.07)	0.36
Histidine	0.91 (0.73, 1.13)	0.77 (0.60, 1.00)	0.82 (0.62, 1.08)	0.75 (0.54, 1.03)	0.11	0.96 (0.84, 1.08)	0.48
Lysine	0.93 (0.75, 1.15)	0.79 (0.62, 1.00)	0.89 (0.69, 1.15)	0.81 (0.60, 1.10)	0.28	0.97 (0.86, 1.08)	0.55
Methionine	0.93 (0.75, 1.15)	0.76 (0.60, 0.98)	0.84 (0.64, 1.09)	0.76 (0.56, 1.03)	0.12	0.95 (0.84, 1.07)	0.42
Phenylalanine	0.84 (0.67, 1.05)	0.76 (0.59, 0.99)	0.72 (0.54, 0.97)	0.70 (0.50, 0.98)	0.07	0.94 (0.82, 1.07)	0.36
Threonine	0.87 (0.70, 1.08)	0.79 (0.61, 1.01)	0.83 (0.63, 1.09)	0.80 (0.58, 1.09)	0.28	0.95 (0.84, 1.07)	0.41
Tryptophan	0.90 (0.72, 1.13)	0.88 (0.68, 1.14)	0.72 (0.54, 0.96)	0.81 (0.59, 1.13)	0.23	0.95 (0.84, 1.08)	0.45
Alanine	0.90 (0.73, 1.12)	0.76 (0.59, 0.98)	0.85 (0.65, 1.11)	0.80 (0.59, 1.09)	0.26	0.97 (0.86, 1.09)	0.58
Arginine	0.91 (0.73, 1.14)	0.87 (0.68, 1.11)	0.85 (0.65, 1.13)	0.78 (0.57, 1.08)	0.19	0.97 (0.86, 1.10)	0.62
Asparagine	0.95 (0.76, 1.19)	0.78 (0.61, 1.01)	0.79 (0.59, 1.04)	0.73 (0.53, 1.01)	0.07	0.92 (0.81, 1.04)	0.19
Aspartic acid	0.98 (0.79, 1.21)	0.80 (0.63, 1.02)	0.90 (0.70, 1.17)	0.87 (0.65, 1.17)	0.46	0.97 (0.87, 1.09)	0.62
Cystine	0.85 (0.68, 1.07)	0.75 (0.58, 0.98)	0.71 (0.53, 0.95)	0.62 (0.44, 0.87)	0.01	0.91 (0.80, 1.04)	0.18
Glutamine	0.92 (0.73, 1.16)	0.87 (0.66, 1.14)	0.68 (0.50, 0.93)	0.68 (0.47, 0.98)	0.02	0.84 (0.73, 0.97)	0.02
Glutamic acid	0.97 (0.78, 1.21)	0.81 (0.64, 1.04)	0.89 (0.68, 1.16)	0.89 (0.66, 1.21)	0.56	0.96 (0.85, 1.07)	0.45
Glycine	0.89 (0.71, 1.10)	0.82 (0.64, 1.05)	0.90 (0.69, 1.17)	0.81 (0.60, 1.11)	0.32	0.99 (0.88, 1.11)	0.83
Proline	0.89 (0.71, 1.12)	0.85 (0.65, 1.11)	0.80 (0.59, 1.08)	0.79 (0.56, 1.11)	0.34	0.93 (0.81, 1.06)	0.25
Serine	0.92 (0.73, 1.15)	0.79 (0.61, 1.03)	0.75 (0.56, 1.02)	0.73 (0.52, 1.04)	0.10	0.93 (0.82, 1.07)	0.32
Tyrosine	0.88 (0.71, 1.11)	0.92 (0.72, 1.19)	0.80 (0.60, 1.07)	0.83 (0.60, 1.15)	0.36	0.95 (0.83, 1.08)	0.41
Hydroxyproline	1.10 (0.89, 1.35)	1.08 (0.87, 1.35)	1.06 (0.84, 1.34)	1.06 (0.82, 1.37)	0.68	1.00 (0.91, 1.11)	0.93
Taurine	0.98 (0.80, 1.21)	0.85 (0.68, 1.06)	0.90 (0.72, 1.12)	0.95 (0.76, 1.20)	0.68	0.98 (0.90, 1.08)	0.71

1. Analyses were based on non-energy adjusted grams of intake of dietary amino acids. The model was stratified by age (in years) and follow-up intervals, and adjusted for ethnicity (white, non-white), marital status (married, widowed, divorced/separated, unknown), smoking status (never, past, current: 1–14, 15–24, ≥25 cigarettes/day,

unknown status or cigarette number), alcohol intake (never drinkers, 0.1-4.9, 5.0-9.9, 10.0-14.9, 15.0+ g/d), physical activity (<3, 3–9, 9–18, 18–27, 27–42, ≥42 metabolic equivalents/week, unknown), menopausal status and postmenopausal hormone use (premenopausal, postmenopausal: never, past, current users, NHS and NHSII only), oral contraception use (never, past, current user, NHSII only), multivitamin use (no, yes), aspirin use (no, yes), body mass index (<23, 23–24.9, 25–29.9, 30–34.9, ≥35 kg/m^2, missing), baseline history of hypertension (no, yes), baseline hypercholesteremia (no, yes), baseline diabetes (no, yes), and energy intake (fifths of intake). Results from NHS, NHSII and HPFS were pooled using a fixed-effects meta-analysis.

2. Linear trends estimated by fitting the median values in each fifth of intake as a pseudo-continuous variable in the Cox regression.
3. P-values estimated by fitting the continuous intakes of dietary amino acids in the Cox regression.

Supplementary table 13: Hazard ratios (95% confidence intervals) for total stroke (5997 cases) by fifths and per SD difference of raw grams of dietary amino acids.

	HR (95% CI), fifths of intake compared to bottom fifth[1]					HR (95% CI) per SD higher	
Amino acids	**Q2**	**Q3**	**Q4**	**Q5**	***p*-trend[2]**	**intake[1]**	***p*-value[3]**
Isoleucine	1.02 (0.94, 1.11)	1.03 (0.94, 1.14)	0.99 (0.89, 1.11)	0.93 (0.82, 1.05)	0.15	0.97 (0.93, 1.02)	0.22
Leucine	0.99 (0.91, 1.08)	1.03 (0.93, 1.14)	0.96 (0.86, 1.07)	0.93 (0.82, 1.06)	0.21	0.97 (0.92, 1.02)	0.18
Valine	1.02 (0.94, 1.11)	1.03 (0.93, 1.13)	0.97 (0.87, 1.08)	0.93 (0.82, 1.05)	0.15	0.96 (0.92, 1.01)	0.12
Histidine	1.02 (0.93, 1.11)	1.02 (0.92, 1.12)	1.02 (0.91, 1.13)	0.96 (0.85, 1.08)	0.44	0.98 (0.94, 1.03)	0.50
Lysine	1.02 (0.94, 1.11)	1.02 (0.93, 1.12)	0.99 (0.90, 1.10)	0.99 (0.88, 1.11)	0.72	0.99 (0.94, 1.03)	0.55
Methionine	1.01 (0.93, 1.10)	1.03 (0.94, 1.13)	1.01 (0.91, 1.12)	0.96 (0.85, 1.08)	0.43	0.98 (0.94, 1.03)	0.39
Phenylalanine	1.00 (0.91, 1.09)	1.03 (0.93, 1.14)	0.96 (0.85, 1.07)	0.92 (0.81, 1.05)	0.14	0.96 (0.91, 1.01)	0.10
Threonine	1.00 (0.92, 1.09)	1.03 (0.94, 1.14)	1.01 (0.91, 1.12)	0.97 (0.86, 1.09)	0.54	0.98 (0.94, 1.03)	0.45
Tryptophan	1.00 (0.92, 1.09)	1.05 (0.95, 1.16)	0.97 (0.87, 1.08)	0.98 (0.86, 1.11)	0.50	0.97 (0.93, 1.02)	0.30
Alanine	1.02 (0.94, 1.11)	1.04 (0.95, 1.15)	1.02 (0.92, 1.13)	1.01 (0.90, 1.13)	0.98	1.00 (0.95, 1.04)	0.83
Arginine	1.04 (0.95, 1.13)	1.11 (1.01, 1.22)	1.05 (0.94, 1.17)	1.02 (0.90, 1.15)	0.89	0.99 (0.95, 1.04)	0.74
Asparagine	1.02 (0.93, 1.11)	1.03 (0.94, 1.14)	1.01 (0.90, 1.12)	0.94 (0.83, 1.07)	0.25	0.97 (0.93, 1.02)	0.23
Aspartic acid	0.99 (0.91, 1.08)	1.05 (0.96, 1.15)	1.04 (0.94, 1.15)	1.02 (0.91, 1.14)	0.64	1.00 (0.96, 1.05)	0.91
Cystine	0.96 (0.88, 1.05)	1.00 (0.90, 1.10)	0.97 (0.86, 1.08)	0.85 (0.75, 0.97)	0.02	0.96 (0.91, 1.01)	0.09
Glutamine	1.00 (0.92, 1.10)	0.95 (0.85, 1.06)	0.88 (0.78, 0.99)	0.77 (0.67, 0.88)	<0.001	0.90 (0.85, 0.95)	<0.001
Glutamic acid	1.00 (0.92, 1.09)	1.01 (0.92, 1.11)	1.02 (0.92, 1.13)	0.97 (0.87, 1.09)	0.59	0.98 (0.94, 1.02)	0.38
Glycine	1.02 (0.93, 1.11)	1.02 (0.93, 1.12)	1.06 (0.96, 1.18)	1.01 (0.90, 1.14)	0.87	1.00 (0.96, 1.05)	0.91
Proline	0.99 (0.91, 1.09)	1.00 (0.90, 1.11)	0.93 (0.83, 1.04)	0.86 (0.75, 0.98)	0.02	0.93 (0.89, 0.98)	0.007
Serine	1.02 (0.94, 1.12)	1.00 (0.90, 1.11)	0.98 (0.88, 1.10)	0.91 (0.79, 1.03)	0.09	0.96 (0.91, 1.01)	0.08
Tyrosine	1.00 (0.92, 1.09)	1.04 (0.95, 1.15)	0.96 (0.86, 1.07)	0.91 (0.81, 1.04)	0.10	0.96 (0.92, 1.01)	0.10
Hydroxyproline	1.01 (0.93, 1.09)	1.00 (0.92, 1.09)	1.10 (1.01, 1.20)	1.13 (1.03, 1.24)	0.002	1.05 (1.01, 1.09)	0.01
Taurine	0.98 (0.90, 1.06)	0.96 (0.88, 1.05)	1.03 (0.95, 1.12)	0.97 (0.89, 1.06)	0.77	1.00 (0.96, 1.03)	0.89

1. Analyses were based on non-energy adjusted grams of intake of dietary amino acids. The model was stratified by age (in years) and follow-up intervals, and adjusted for ethnicity (white, non-white), marital status (married, widowed, divorced/separated, unknown), smoking status (never, past, current: 1–14, 15–24, ≥25 cigarettes/day,

unknown status or cigarette number), alcohol intake (never drinkers, 0.1-4.9, 5.0-9.9, 10.0-14.9, 15.0+ g/d), physical activity (<3, 3–9, 9–18, 18–27, 27–42, ≥42 metabolic equivalents/week, unknown), menopausal status and postmenopausal hormone use (premenopausal, postmenopausal: never, past, current users, NHS and NHSII only), oral contraception use (never, past, current user, NHSII only), multivitamin use (no, yes), aspirin use (no, yes), body mass index (<23, 23–24.9, 25–29.9, 30–34.9, ≥35 kg/m^2, missing), baseline history of hypertension (no, yes), baseline hypercholesteremia (no, yes), baseline diabetes (no, yes), and energy intake (fifths of intake). Results from NHS, NHSII and HPFS were pooled using a fixed-effects meta-analysis.

2. Linear trends estimated by fitting the median values in each fifth of intake as a pseudo-continuous variable in the Cox regression.
3. P-values estimated by fitting the continuous intakes of dietary amino acids in the Cox regression.

Supplementary table 14: Hazard ratios (95% confidence intervals) for ischemic, hemorrhagic and total stroke by per SD difference of energy-adjusted grams of dietary amino acids, with a 4-year lag.

	Ischemic stroke (2832 cases)		Hemorrhagic stroke (775 cases)		Total stroke (5610 cases)	
Amino acids	**HR (95% CI)[1]**	***p*-value[2]**	**HR (95% CI)[1]**	***p*-value[2]**	**HR (95% CI)[1]**	***p*-value[2]**
Isoleucine	0.97 (0.93, 1.01)	0.16	0.98 (0.90, 1.07)	0.64	0.98 (0.95, 1.02)	0.33
Leucine	0.97 (0.92, 1.01)	0.13	0.99 (0.91, 1.07)	0.76	0.98 (0.95, 1.01)	0.29
Valine	0.96 (0.92, 1.01)	0.09	0.98 (0.90, 1.07)	0.66	0.98 (0.95, 1.01)	0.20
Histidine	0.98 (0.94, 1.02)	0.32	0.99 (0.91, 1.08)	0.90	0.99 (0.96, 1.03)	0.74
Lysine	0.97 (0.93, 1.02)	0.21	0.99 (0.91, 1.08)	0.86	0.99 (0.96, 1.02)	0.67
Methionine	0.97 (0.93, 1.01)	0.17	0.99 (0.91, 1.08)	0.78	0.99 (0.96, 1.02)	0.54
Phenylalanine	0.96 (0.92, 1.01)	0.11	0.98 (0.90, 1.07)	0.70	0.98 (0.95, 1.01)	0.21
Threonine	0.97 (0.93, 1.02)	0.24	0.99 (0.91, 1.07)	0.77	0.99 (0.96, 1.02)	0.62
Tryptophan	0.97 (0.93, 1.02)	0.19	0.98 (0.90, 1.07)	0.72	0.99 (0.96, 1.02)	0.47
Alanine	0.98 (0.94, 1.03)	0.44	1.01 (0.92, 1.09)	0.90	1.00 (0.97, 1.04)	0.83
Arginine	0.98 (0.94, 1.03)	0.50	1.00 (0.92, 1.09)	0.92	1.00 (0.97, 1.04)	0.78
Asparagine	0.97 (0.93, 1.02)	0.21	0.96 (0.88, 1.05)	0.40	0.99 (0.95, 1.02)	0.36
Aspartic acid	0.99 (0.94, 1.03)	0.58	1.00 (0.92, 1.09)	0.98	1.01 (0.97, 1.04)	0.68
Cystine	0.98 (0.94, 1.02)	0.34	0.99 (0.91, 1.07)	0.74	0.99 (0.96, 1.02)	0.43
Glutamine	0.96 (0.92, 1.00)	0.07	0.93 (0.86, 1.02)	0.12	0.95 (0.92, 0.98)	0.004
Glutamic acid	0.97 (0.93, 1.01)	0.15	0.98 (0.90, 1.07)	0.68	0.99 (0.96, 1.02)	0.49
Glycine	0.99 (0.95, 1.03)	0.64	1.02 (0.94, 1.11)	0.66	1.01 (0.98, 1.04)	0.54
Proline	0.95 (0.91, 1.00)	0.03	0.97 (0.89, 1.05)	0.47	0.96 (0.93, 0.99)	0.01
Serine	0.96 (0.92, 1.01)	0.09	0.98 (0.90, 1.07)	0.66	0.98 (0.95, 1.01)	0.15
Tyrosine	0.96 (0.92, 1.00)	0.07	0.98 (0.91, 1.07)	0.71	0.98 (0.95, 1.01)	0.16
Hydroxyproline	1.02 (0.98, 1.07)	0.30	1.02 (0.94, 1.12)	0.59	1.04 (1.01, 1.08)	0.012
Taurine	0.99 (0.95, 1.04)	0.71	1.01 (0.93, 1.10)	0.86	1.01 (0.98, 1.04)	0.56

1. Analyses were stratified by age (in years) and follow-up intervals, and adjusted for ethnicity (white, non-white), marital status (married, widowed, divorced/separated, unknown), smoking status (never, past, current: 1–14, 15–24, ≥25 cigarettes/day, unknown status or cigarette number), alcohol intake (never drinkers, 0.1-4.9, 5.0-9.9, 10.0-14.9, 15.0+ g/d), physical activity (<3, 3–9, 9–18, 18–27, 27–42, ≥42 metabolic equivalents/week, unknown), menopausal status and postmenopausal hormone use

(premenopausal, postmenopausal: never, past, current users, NHS and NHSII only), oral contraception use (never, past, current user, NHSII only), multivitamin use (no, yes), aspirin use (no, yes), body mass index (<23, 23–24.9, 25–29.9, 30–34.9, ≥35 kg/m^2, missing), baseline history of hypertension (no, yes), baseline hypercholesteremia (no, yes), baseline diabetes (no, yes), and energy intake (fifths of intake). Results from NHS, NHSII and HPFS were pooled using a fixed-effects meta-analysis.

2. P-values estimated by fitting the continuous intakes of dietary amino acids in the Cox regression.

Supplementary table 15: Hazard ratios (95% confidence intervals) for total stroke (5997 cases) by per SD difference of energy-adjusted grams of dietary amino acids significantly associated with risk, further adjusting for other dietary amino acids.

	Glutamine			Proline			Hydroxyproline		
	ρ[1]	**HR (95% CI)[2]**	***p*-value[3]**	**ρ[1]**	**HR (95% CI)[2]**	***p*-value[3]**	**ρ[1]**	**HR (95% CI)[2]**	***p*-value[3]**
Multivariable		0.94 (0.91, 0.97)	<0.001		0.96 (0.93, 0.99)	0.004		1.05 (1.02, 1.06)	0.002
Further adjusted for									
Isoleucine	0.62	0.92 (0.88, 0.95)	<0.001	0.86	0.89 (0.84, 0.95)	<0.001	0.61	1.09 (1.05, 1.14)	<0.001
Leucine	0.64	0.92 (0.88, 0.96)	<0.001	0.90	0.89 (0.84, 0.95)	<0.001	0.60	1.10 (1.06, 1.14)	<0.001
Valine	0.63	0.92 (0.89, 0.96)	<0.001	0.90	0.89 (0.84, 0.95)	0.001	0.57	1.09 (1.05, 1.13)	<0.001
Histidine	0.57	0.92 (0.88, 0.95)	<0.001	0.79	0.91 (0.87, 0.95)	<0.001	0.73	1.12 (1.07, 1.18)	<0.001
Lysine	0.53	0.92 (0.89, 0.95)	<0.001	0.80	0.91 (0.86, 0.95)	<0.001	0.71	1.11 (1.06, 1.16)	<0.001
Methionine	0.56	0.92 (0.88, 0.95)	<0.001	0.80	0.91 (0.87, 0.96)	<0.001	0.70	1.11 (1.06, 1.15)	<0.001
Phenylalanine	0.69	0.92 (0.88, 0.96)	<0.001	0.88	0.91 (0.86, 0.97)	0.003	0.56	1.09 (1.05, 1.14)	<0.001
Threonine	0.57	0.92 (0.88, 0.95)	<0.001	0.79	0.90 (0.86, 0.95)	<0.001	0.68	1.10 (1.06, 1.15)	<0.001
Tryptophan	0.66	0.91 (0.88, 0.95)	<0.001	0.82	0.89 (0.85, 0.94)	<0.001	0.56	1.09 (1.05, 1.13)	<0.001
Alanine	0.53	0.92 (0.89, 0.95)	<0.001	0.71	0.92 (0.89, 0.96)	<0.001	0.76	1.12 (1.07, 1.18)	<0.001
Arginine	0.52	0.92 (0.89, 0.95)	<0.001	0.66	0.93 (0.90, 0.97)	<0.001	0.71	1.11 (1.06, 1.16)	<0.001
Asparagine	0.61	0.92 (0.88, 0.96)	<0.001	0.81	0.92 (0.88, 0.97)	0.001	0.52	1.08 (1.05, 1.13)	<0.001
Aspartic acid	0.47	0.92 (0.89, 0.95)	<0.001	0.66	0.93 (0.89, 0.96)	<0.001	0.74	1.10 (1.05, 1.16)	<0.001
Cystine	0.69	0.92 (0.88, 0.96)	<0.001	0.79	0.95 (0.91, 0.99)	0.019	0.43	1.10 (1.06, 1.14)	<0.001
Glutamine	-	-	-	0.76	1.01 (0.96, 1.05)	0.78	0.15	1.06 (1.02, 1.09)	<0.001
Glutamic acid	0.52	0.92 (0.89, 0.96)	<0.001	0.82	0.91 (0.87, 0.96)	<0.001	0.65	1.10 (1.06, 1.15)	<0.001
Glycine	0.50	0.92 (0.89, 0.95)	<0.001	0.62	0.93 (0.90, 0.97)	<0.001	0.81	1.14 (1.08, 1.20)	<0.001
Proline	0.76	0.93 (0.89, 0.98)	0.003	-	-	-	0.31	1.07 (1.03, 1.10)	<0.001
Serine	0.68	0.92 (0.88, 0.96)	<0.001	0.91	0.89 (0.83, 0.96)	0.002	0.52	1.09 (1.05, 1.13)	<0.001
Tyrosine	0.63	0.92 (0.89, 0.96)	<0.001	0.91	0.88 (0.82, 0.95)	0.001	0.55	1.09 (1.05, 1.13)	<0.001
Hydroxyproline	0.15	0.93 (0.90, 0.96)	<0.001	0.31	0.94 (0.91, 0.97)	<0.001	-	-	-
Taurine	0.34	0.93 (0.90, 0.96)	<0.001	0.45	0.95 (0.92, 0.98)	0.001	0.62	1.07 (1.03, 1.11)	<0.001

1. Spearman's rho for correlation between glutamine, proline or hydroxyproline and each of the other amino acids, based on dietary data collected at mid-point of follow-up (1998 for NHS, 2003 for NHSII, 1998 for HPFS).
2. Analyses were stratified by age (in years) and follow-up intervals, and adjusted for ethnicity (white, non-white), marital status (married, widowed, divorced/separated, unknown), smoking status (never, past, current: 1–14, 15–24, ≥25 cigarettes/day, unknown status or cigarette number), alcohol intake (never drinkers, 0.1-4.9, 5.0-9.9, 10.0-14.9, 15.0+ g/d), physical activity (<3, 3–9, 9–18, 18–27, 27–42, ≥42 metabolic equivalents/week, unknown), menopausal status and postmenopausal hormone use (premenopausal, postmenopausal: never, past, current users, NHS and NHSII only), oral contraception use (never, past, current user, NHSII only), multivitamin use (no, yes), aspirin use (no, yes), body mass index (<23, 23–24.9, 25–29.9, 30–34.9, ≥35 kg/m^2, missing), baseline history of hypertension (no, yes), baseline hypercholesteremia (no, yes), baseline diabetes (no, yes), and energy intake (fifths of intake). Results from NHS, NHSII and HPFS were pooled using a fixed-effects meta-analysis.
3. P-values estimated by fitting the continuous intakes of dietary amino acids in the Cox regression.

Supplementary table 16: Hazard ratios (95% confidence intervals) for ischemic stroke (3058 cases) by per SD difference of energy-adjusted grams of dietary amino acids significantly associated with risk, further adjusting for macronutrients and major dietary sources.

	Glutamine			Proline		
	ρ[1]	**HR (95% CI)[2]**	***p*-value[3]**	**ρ[1]**	**HR (95% CI)[2]**	***p*-value[3]**
Multivariable		0.94 (0.90, 0.98)	0.004		0.94 (0.90, 0.98)	0.005
Further adjusted for nutrients						
Total protein	0.65	0.94 (0.89, 0.99)	0.03	0.85	0.92 (0.85, 0.99)	0.03
Animal protein	0.43	0.94 (0.90, 0.99)	0.01	0.78	0.91 (0.85, 0.98)	0.008
Plant protein	0.53	0.94 (0.90, 0.98)	0.007	0.16	0.94 (0.90, 0.98)	0.005
Dairy protein	0.33	0.95 (0.91, 1.00)	0.04	0.73	0.96 (0.90, 1.02)	0.17
Saturated fat	-0.08	0.94 (0.90, 0.98)	0.004	0.18	0.94 (0.90, 0.98)	0.005
Monounsaturated fat	-0.12	0.94 (0.90, 0.98)	0.005	0.006	0.94 (0.90, 0.98)	0.005
Polyunsaturated fat	-0.005	0.94 (0.90, 0.98)	0.003	-0.03	0.94 (0.90, 0.98)	0.002
Total carbohydrates	0.23	0.94 (0.90, 0.98)	0.004	-0.04	0.93 (0.89, 0.98)	0.003
Total fibre	0.32	0.94 (0.90, 0.98)	0.005	0.10	0.94 (0.90, 0.98)	0.005
Further adjusted for food groups						
Whole grains	0.37	0.92 (0.88, 0.97)	0.001	0.14	0.94 (0.90, 0.98)	0.003
Refined grains	0.22	0.94 (0.90, 0.98)	0.004	-0.06	0.94 (0.90, 0.98)	0.004
Fruits	0.03	0.94 (0.90, 0.98)	0.005	-0.002	0.94 (0.90, 0.98)	0.005
Vegetables	0.10	0.93 (0.89, 0.97)	0.002	0.06	0.94 (0.90, 0.98)	0.003
Nuts and seeds	-0.01	0.94 (0.90, 0.98)	0.003	0.01	0.94 (0.90, 0.98)	0.003
Legumes	0.18	0.94 (0.90, 0.98)	0.006	0.12	0.94 (0.90, 0.98)	0.006
Total dairy	0.16	0.95 (0.90, 0.99)	0.01	0.48	0.95 (0.90, 1.00)	0.04
Milk	0.21	0.94 (0.90, 0.98)	0.009	0.46	0.94 (0.89, 0.98)	0.01
Cheese	0.09	0.94 (0.90, 0.98)	0.005	0.28	0.94 (0.90, 0.98)	0.004
Yogurt	0.12	0.94 (0.90, 0.99)	0.01	0.29	0.95 (0.91, 0.99)	0.02
Eggs	0.02	0.94 (0.90, 0.98)	0.005	0.11	0.94 (0.90, 0.98)	0.004

Fish	0.17	0.95 (0.91, 0.99)	0.02	0.17	0.95 (0.91, 0.99)	0.02
Total meat	0.09	0.94 (0.90, 0.98)	0.004	0.23	0.93 (0.89, 0.97)	0.002
Red meat	-0.06	0.95 (0.90, 0.99)	0.01	0.10	0.94 (0.90, 0.98)	0.005
Poultry	0.28	0.94 (0.90, 0.98)	0.005	0.30	0.94 (0.90, 0.98)	0.006

1. Spearman's rho for correlation between glutamine or proline and each of the other nutrients and food groups, based on dietary data collected at mid-point of follow-up (1998 for NHS, 2003 for NHSII, 1998 for HPFS).
2. Analyses were stratified by age (in years) and follow-up intervals, and adjusted for ethnicity (white, non-white), marital status (married, widowed, divorced/separated, unknown), smoking status (never, past, current: 1–14, 15–24, ≥25 cigarettes/day, unknown status or cigarette number), alcohol intake (never drinkers, 0.1-4.9, 5.0-9.9, 10.0-14.9, 15.0+ g/d), physical activity (<3, 3–9, 9–18, 18–27, 27–42, ≥42 metabolic equivalents/week, unknown), menopausal status and postmenopausal hormone use (premenopausal, postmenopausal: never, past, current users, NHS and NHSII only), oral contraception use (never, past, current user, NHSII only), multivitamin use (no, yes), aspirin use (no, yes), body mass index (<23, 23–24.9, 25–29.9, 30–34.9, ≥35 kg/m^2, missing), baseline history of hypertension (no, yes), baseline hypercholesteremia (no, yes), baseline diabetes (no, yes), and energy intake (fifths of intake). Results from NHS, NHSII and HPFS were pooled using a fixed-effects meta-analysis.
3. P-values estimated by fitting the continuous intakes of dietary amino acids in the Cox regression.

Supplementary table 17: Hazard ratios (95% confidence intervals) for total stroke (5997 cases) by per SD difference of energy-adjusted grams of dietary amino acids significantly associated with risk, further adjusting for macronutrients and major dietary sources.

	Glutamine			Proline			Hydroxyproline		
	ρ[1]	**HR (95% CI)[2]**	***p*-value[3]**	**ρ[1]**	**HR (95% CI)[2]**	***p*-value[3]**	**ρ[1]**	**HR (95% CI)[2]**	***p*-value[3]**
Multivariable		0.94 (0.91, 0.97)	<0.001		0.96 (0.93, 0.99)	0.004		1.05 (1.02, 1.06)	0.002
Further adjusted for nutrients									
Total protein	0.65	0.92 (0.88, 0.95)	<0.001	0.85	0.91 (0.86, 0.96)	0.001	0.64	1.11 (1.06, 1.15)	<0.001
Animal protein	0.43	0.92 (0.89, 0.95)	<0.001	0.78	0.89 (0.85, 0.94)	<0.001	0.73	1.10 (1.06, 1.16)	<0.001
Plant protein	0.53	0.95 (0.92, 0.98)	0.002	0.16	0.96 (0.93, 0.99)	0.003	-0.22	1.04 (1.00, 1.07)	0.04
Dairy protein	0.33	0.95 (0.91, 0.98)	0.001	0.73	0.98 (0.94, 1.02)	0.34	-0.18	1.04 (1.01, 1.07)	0.02
Saturated fat	-0.08	0.94 (0.91, 0.97)	<0.001	0.18	0.95 (0.93, 0.98)	0.003	0.46	1.04 (1.01, 1.08)	0.01
Monounsaturated fat	-0.12	0.94 (0.91, 0.97)	<0.001	0.006	0.96 (0.93, 0.99)	0.005	0.41	1.05 (1.01, 1.08)	0.006
Polyunsaturated fat	-0.005	0.93 (0.90, 0.96)	<0.001	-0.03	0.95 (0.92, 0.98)	<0.001	0.19	1.05 (1.02, 1.08)	0.002
Total carbohydrates	0.23	0.94 (0.91, 0.97)	<0.001	-0.04	0.95 (0.92, 0.98)	<0.001	-0.42	1.05 (1.01, 1.10)	0.01
Total fibre	0.32	0.94 (0.91, 0.97)	<0.001	0.10	0.96 (0.93, 0.99)	0.005	-0.21	1.04 (1.01, 1.08)	0.01
Further adjusted for food groups									
Whole grains	0.37	0.93 (0.90, 0.96)	<0.001	0.14	0.96 (0.93, 0.99)	0.005	-0.16	1.05 (1.02, 1.08)	0.004
Refined grains	0.22	0.94 (0.91, 0.97)	<0.001	-0.06	0.95 (0.93, 0.98)	0.003	-0.11	1.05 (1.02, 1.08)	0.004
Fruits	0.03	0.94 (0.91, 0.97)	<0.001	-0.002	0.96 (0.93, 0.99)	0.004	-0.19	1.05 (1.02, 1.08)	0.003
Vegetables	0.10	0.93 (0.90, 0.96)	<0.001	0.06	0.95 (0.93, 0.98)	0.003	-0.01	1.05 (1.02, 1.08)	0.003
Nuts and seeds	-0.01	0.93 (0.91, 0.96)	<0.001	0.01	0.95 (0.93, 0.98)	0.002	-0.05	1.05 (1.01, 1.08)	0.006
Legumes	0.18	0.94 (0.91, 0.97)	<0.001	0.12	0.96 (0.93, 0.99)	0.004	0.005	1.05 (1.02, 1.08)	0.002
Total dairy	0.16	0.94 (0.91, 0.97)	<0.001	0.48	0.97 (0.93, 1.00)	0.059	-0.14	1.04 (1.01, 1.08)	0.009
Milk	0.21	0.94 (0.91, 0.97)	<0.001	0.46	0.95 (0.92, 0.99)	0.013	-0.16	1.05 (1.01, 1.08)	0.005
Cheese	0.09	0.94 (0.91, 0.97)	<0.001	0.28	0.96 (0.93, 0.99)	0.006	0.03	1.05 (1.02, 1.08)	0.003
Yogurt	0.12	0.94 (0.91, 0.97)	<0.001	0.29	0.97 (0.94, 1.00)	0.03	-0.15	1.04 (1.01, 1.08)	0.010
Eggs	0.02	0.94 (0.91, 0.97)	<0.001	0.11	0.96 (0.93, 0.98)	0.003	0.15	1.05 (1.01, 1.08)	0.004
Fish	0.17	0.94 (0.91, 0.97)	<0.001	0.17	0.96 (0.93, 0.99)	0.007	0.19	1.05 (1.02, 1.09)	0.001

Total meat	0.09	0.94 (0.91, 0.96)	<0.001	0.23	0.95 (0.92, 0.98)	<0.001	0.76	1.02 (0.96, 1.08)	0.56
Red meat	-0.06	0.94 (0.92, 0.98)	<0.001	0.10	0.96 (0.93, 0.99)	0.004	0.68	1.01 (0.97, 1.05)	0.70
Poultry	0.28	0.93 (0.90, 0.97)	<0.001	0.30	0.96 (0.93, 0.99)	0.006	0.42	1.07 (1.03, 1.10)	<0.001

1. Spearman's rho for correlation between glutamine, proline or hydroxyproline and each of the other nutrients and food groups, based on dietary data collected at mid-point of follow-up (1998 for NHS, 2003 for NHSII, 1998 for HPFS).
2. Analyses were stratified by age (in years) and follow-up intervals, and adjusted for ethnicity (white, non-white), marital status (married, widowed, divorced/separated, unknown), smoking status (never, past, current: 1–14, 15–24, ≥25 cigarettes/day, unknown status or cigarette number), alcohol intake (never drinkers, 0.1-4.9, 5.0-9.9, 10.0-14.9, 15.0+ g/d), physical activity (<3, 3–9, 9–18, 18–27, 27–42, ≥42 metabolic equivalents/week, unknown), menopausal status and postmenopausal hormone use (premenopausal, postmenopausal: never, past, current users, NHS and NHSII only), oral contraception use (never, past, current user, NHSII only), multivitamin use (no, yes), aspirin use (no, yes), body mass index (<23, 23–24.9, 25–29.9, 30–34.9, ≥35 kg/m^2, missing), baseline history of hypertension (no, yes), baseline hypercholesteremia (no, yes), baseline diabetes (no, yes), and energy intake (fifths of intake). Results from NHS, NHSII and HPFS were pooled using a fixed-effects meta-analysis.
3. P-values estimated by fitting the continuous intakes of dietary amino acids in the Cox regression.

Supplementary table 18: Hazard ratios (95% confidence intervals) for total stroke by per SD difference of energy-adjusted grams of dietary amino acids significantly associated with risk, stratified by key covariates.

	HR (95% CI)[1]	*p*-value[2]	HR (95% CI)[1]	*p*-value[2]	*p*-interaction[3]
Age	Age below 55 years		Age 55 years or older		
Cases/person-years	683/2,394,569		5314/2,569,715		
Glutamine	0.92 (0.84, 1.00)	0.05	0.94 (0.91, 0.97)	<0.001	0.64
Proline	0.98 (0.90, 1.07)	0.70	0.95 (0.92, 0.98)	0.003	0.79
Hydroxyproline	1.00 (0.92, 1.09)	0.93	1.06 (1.02, 1.09)	0.001	0.48
BMI	Normal weight (<25kg/m^2)		Overweight (≥25 kg/m^2)		
Cases/person-years	2573/2,358,393		3417/2,581,743		
Glutamine	0.93 (0.89, 0.97)	0.002	0.94 (0.91, 0.98)	0.006	0.42
Proline	0.94 (0.90, 0.99)	0.02	0.97 (0.93, 1.01)	0.10	0.33
Hydroxyproline	1.02 (0.97, 1.07)	0.39	1.07 (1.02, 1.11)	0.002	0.15
Smoking status	Never smokers		Ever smokers		
Cases/person-years	2519/2,650,509		3369/2,253,886		
Glutamine	0.94 (0.89, 0.98)	0.009	0.93 (0.90, 0.97)	0.001	0.56
Proline	0.95 (0.91, 1.00)	0.03	0.96 (0.92, 1.00)	0.042	0.80
Hydroxyproline	1.00 (0.96, 1.05)	0.89	1.08 (1.04, 1.13)	<0.001	0.07
Alcohol consumption	Never/occasional drinkers (<5g/day)		Regular drinkers (≥5g/day)		
Cases/person-years	3566/3,283,161		2431/1,681,124		
Glutamine	0.94 (0.90, 0.98)	0.002	0.93 (0.89, 0.98)	0.01	0.57
Proline	0.96 (0.93, 1.00)	0.03	0.95 (0.91, 1.00)	0.07	0.54
Hydroxyproline	1.03 (1.00, 1.08)	0.09	1.08 (1.02, 1.14)	0.005	0.41
Physical activity	Below median		Above median		
Cases/person-years	1526/2,275,870		1526/2,275,870		
Glutamine	0.95 (0.91, 0.99)	0.01	0.92 (0.88, 0.97)	<0.001	0.79
Proline	0.96 (0.92, 1.00)	0.04	0.96 (0.92, 1.00)	0.059	0.51
Hydroxyproline	1.05 (1.01, 1.10)	0.02	1.05 (1.00, 1.10)	0.054	0.47
Multivitamin use	No		Yes		
Cases/person-years	1277/2,280,340		1781/2,683,941		
Glutamine	0.93 (0.89, 0.98)	0.002	0.94 (0.90, 0.98)	0.005	0.98
Proline	0.95 (0.91, 0.99)	0.03	0.96 (0.93, 1.00)	0.07	0.93
Hydroxyproline	1.04 (0.99, 1.09)	0.11	1.06 (1.01, 1.10)	0.01	0.28

History of hypertension, high cholesterol or diabetes	No baseline disease history		Baseline disease history		
Cases/person-years	3504/3,824,596		2493/1,139,688		
Glutamine	0.96 (0.92, 1.01)	0.08	0.91 (0.87, 0.95)	<0.001	0.90
Proline	0.97 (0.93, 1.01)	0.12	0.95 (0.91, 0.99)	0.02	0.88
Hydroxyproline	1.04 (0.99, 1.08)	0.12	1.07 (1.03, 1.12)	0.002	0.08

1. Analyses were conducted in the particular subset only, with the model stratified by age (in years) and follow-up intervals, and adjusted for ethnicity (white, non-white), marital status (married, widowed, divorced/separated, unknown), smoking status (never, past, current: 1–14, 15–24, ≥25 cigarettes/day, unknown status or cigarette number), alcohol intake (never drinkers, 0.1-4.9, 5.0-9.9, 10.0-14.9, 15.0+ g/d), physical activity (<3, 3–9, 9–18, 18–27, 27–42, ≥42 metabolic equivalents/week, unknown), menopausal status and postmenopausal hormone use (premenopausal, postmenopausal: never, past, current users, NHS and NHSII only), oral contraception use (never, past, current user, NHSII only), multivitamin use (no, yes), aspirin use (no, yes), body mass index (<23, 23–24.9, 25–29.9, 30–34.9, ≥35 kg/m^2, missing), baseline history of hypertension (no, yes), baseline hypercholesteremia (no, yes), baseline diabetes (no, yes), and energy intake (fifths of intake). Results from NHS, NHSII and HPFS were pooled using a fixed-effects meta-analysis.
2. P-values estimated by fitting the continuous intakes of dietary amino acids in the Cox regression.
3. P-interaction estimated by fitting an interaction term of the stratifying variable with the exposure of interest in the Cox regression.