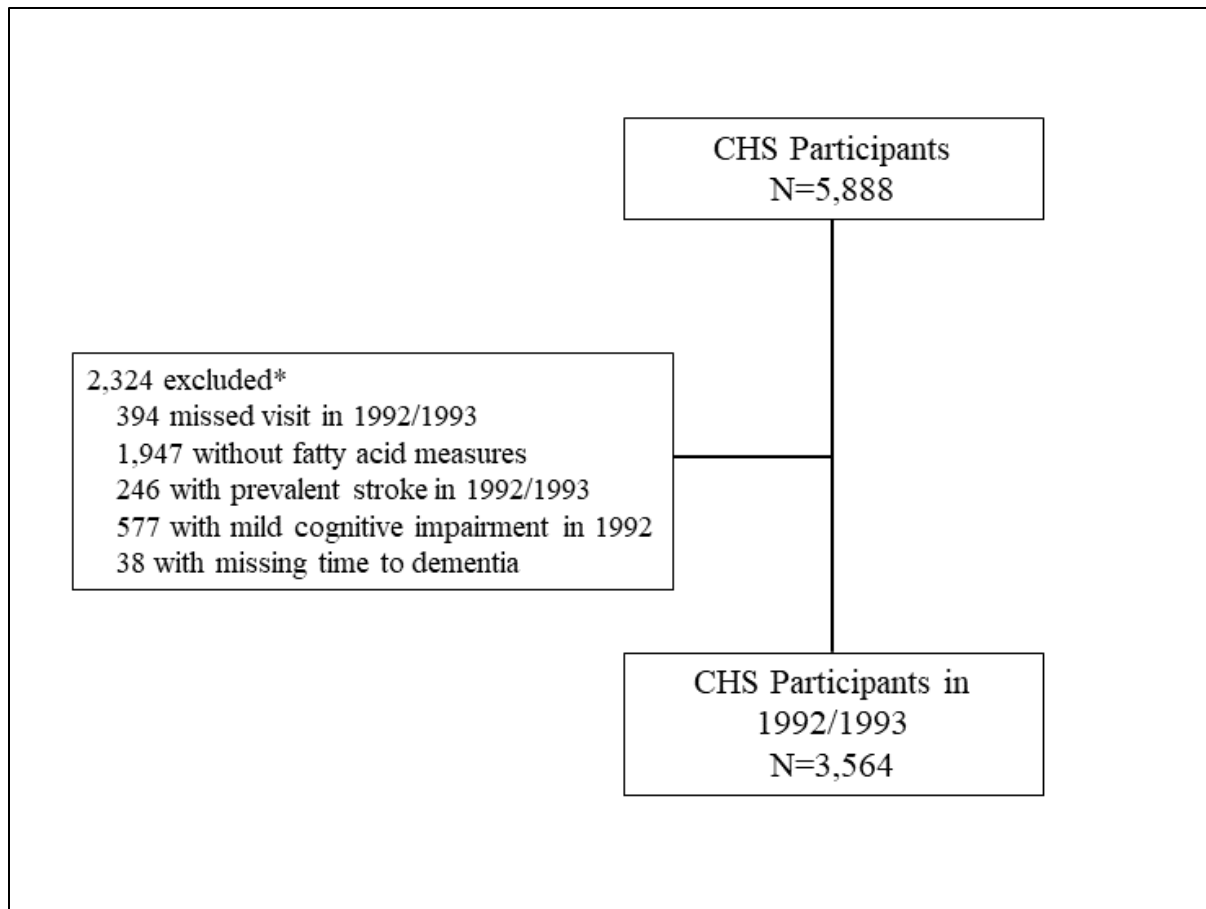**Supplemental Materials**

Supplemental Figure 1. Flowchart of CHS participants included in the present analysis.
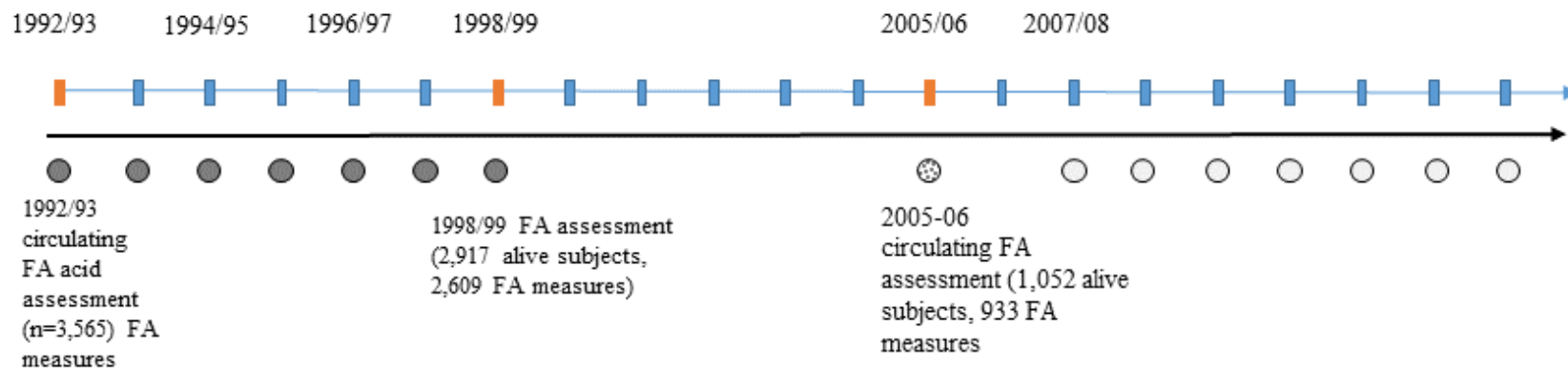
*categories are not mutually exclusive.

Supplemental Table 1. Baseline characteristics of CHS participants by eligibility status

	CHS participants with available fatty acid measures who were free of stroke and dementia in 1992/1993	CHS Participants who did not meet inclusion Criteria
n	3,564	2,324
Demographics		
Mean age (SD), years	74.8 (5)	75.5 (6)
White, n (%)	3,146 (88)	1,811 (78)
Male, n (%)	1,413 (40)	1,093 (47)
High School or higher, n (%)	2,661 (75)	3,749 (72)
Annual income, n (%)		
<12,000	792 (22)	1,470 (27)
$12,000-$24,999	1,281 (36)	1,932 (35)
$25,000-$49,999	995 (28)	1,396 (25)
>$50,000	496 (14)	710 (13)
Lifestyle		
Former Smoker, n (%)	1,507 (42)	2,444 (42)
Current Smoker, n (%)	369 (10)	700 (12)
Mean Physical activity (SD), kcal/week	1,180 (1,371)	1,115 (887)
Mean Body mass index (SD), kg/m2	26.8 (5)	26.4 (5)
Dietary Supplement Use, n (%)	918 (26)	1,471 (25)
Health Status, n (%)		
Coronary Heart Disease	767 (22)	582 (25)
Atrial Fibrillation	125 (4)	157 (3)
Heart Failure	193 (5)	128 (5.5)

Supplemental Table 2: ICD-9 Codes for Alzheimer's disease, senile dementia or related disorders

290.0	Senile dementia, uncomplicated
290.20	Senile dementia with delusional features
290.21	Senile dementia with depressive features
290.3	Senile dementia with delirium
290.40	Vascular dementia, uncomplicated
290.41	Vascular dementia, with delirium
290.42	Vascular dementia, with delusions
290.43	Vascular dementia, with depressed mood
294.0	Amnestic disorder in conditions classified elsewhere
294.10	Dementia in conditions classified elsewhere without behavioral disturbance
294.11	Dementia in conditions classified elsewhere with behavioral disturbance
294.20	Dementia, unspecified, without behavioral disturbance
294.21	Dementia, unspecified, with behavioral disturbance
294.8	Other persistent mental disorders due to conditions classified elsewhere
331.0	Alzheimer's disease
331.11	Pick's disease
331.19	Senile degeneration of brain
331.2	Senile degeneration of brain
331.7	Cerebral degeneration in diseases classified elsewhere
797	Senility without mention of psychosis

1992/93   1994/95   1996/97   1998/99   2005/06   2007/08

1992/93
circulating
FA acid
assessment
(n=3,565) FA
measures

1998/99 FA assessment
(2,917 alive subjects,
2,609 FA measures)

2005-06
circulating FA
assessment (1,052 alive
subjects, 933 FA
measures

Legend

▌   Fatty acid measurements

⬤   Ascertainment and diagnosis of dementia in CHS Memory study; cognitive testing using 3MSE,TICS or IQCODE

◍   cognitive testing using 3MSE,TICS or IQCODE

◯   cognitive testing using TICS or IQCODE

⟶   Continuous identification of dementia cases through CHS hospitalization data

Supplemental Figure 2. Timeline fatty acid and cognitive outcomes.

Supplemental Table 3: Correlations between cumulative average of plasma circulating fatty acids by time period[1]

	ALA			EPA			DPA			DHA			LA			AA		
	1992	1998	2005	1992	1998	2005	1992	1998	2005	1992	1998	2005	1992	1998	2005	1992	1998	2005
ALA, % total FA																		
1992		0.85	0.71	0.28	0.26	0.21	0.20	0.14	0.12				0.22	0.21	0.19	-0.39	-0.38	-0.36
1998			0.92	0.23	0.28	0.25	0.11						0.22	0.23	0.21	-0.36	-0.40	-0.39
2005				0.22	0.28	0.31		0.11	0.14				0.18	0.20	0.22	-0.29	-0.34	-0.36
EPA, % total FA																		
1992					0.90	0.77	0.53	0.47	0.34	0.45	0.44	0.38	-0.36	-0.34	-0.27	0.09	0.11	
1998						0.89	0.49	0.52	0.40	0.45	0.49	0.44	-0.34	-0.38	-0.34	0.12	0.12	
2005							0.35	0.39	0.43	0.39	0.43	0.49	-0.27	-0.32	-0.34	0.10	0.11	0.10
DPA, % total FA																		
1992								0.91	0.80	0.16	0.15	0.17	-0.37	-0.34	-0.26	0.20	0.19	0.11
1998									0.94	0.14	0.15	0.18	-0.34	-0.37	-0.33	0.22	0.22	0.18
2005											0.12	0.16	-0.29	-0.35	-0.36	0.17	0.19	0.18
DHA, % total FA																		
1992											0.93	0.85	-0.23	-0.23	-0.22			
1998												0.94	-0.23	-0.27	-0.24	0.04	0.05	
2005													-0.21	-0.26	-0.27	0.04	0.03	0.04
LA, % total FA																		
1992														0.92	0.81	-0.62	-0.60	-0.53
1998															0.93	-0.61	-0.64	-0.57
2005																-0.56	-0.58	-0.60
AA, % total FA																		
1992																	0.95	0.87
1998																		0.96

[1]Estimated using partial Spearman correlation analysis adjusting for age, sex, race. Only statistically significant coefficients (p-value < 0.05) are shown. N= 1,999 for correlations between 1992 and 1998 and n=332 for correlations with 2005 measures. AA, arachidonic acid; ALA, alpha-linolenic acid; DHA, docosahexaenoic acid; DPA, docosapentaenoic acid; EPA, eicosapentaenoic acid; LA, linoleic acid; FA, fatty acid.