SUPPLEMENTARY MATERIALS

SUPPLEMENTARY TABLE S1. Baseline characteristics of the participants (*n*=4,464).

Baseline characteristics	Male (*n*=2,044)	Female (*n*=2,420)	Overall (*n*=4,464)
Age, years (mean±SD)	42.23±12.00	42.02±11.31	42.12±11.63
Geographic region, *n* (%)			
Urban	544 (12.19)	636 (14.25)	1,180 (26.43)
Rural	1,500 (33.60)	1,784 (39.64)	3,284 (73.57)
Distribution of education level, *n* (%)			
Primary school	747 (16.73)	1,329 (29.77)	2,076 (46.51)
Middle school	796 (17.84)	716 (16.04)	1,512 (33.87)
High school and above	501 (11.22)	375 (8.40)	876 (19.62)
Per capita annual household income, CNY/year [median (IQR)]	9,656.92 (5,475.88–16,317.86)	9,820.00 (5,498.84–16,388.04)	9,700.63 (5,490.01–16,370.44)
Urban score (mean±SD)	56.36 (12.89)	56.02 (13.07)	56.17 (12.99)
Smoking, *n* (%)			
Nonsmoker	773 (17.32)	2,323 (52.04)	3,096 (69.35)
Current smoker	1,271 (28.47)	97 (2.17)	1,368 (30.65)
Alcohol drinking, *n* (%)			
Nondrinker	708 (15.86)	2,126 (47.62)	2,834 (63.49)
Current drinker	1,336 (29.93)	294 (6.59)	1,630 (36.51)
METs/week [median (IQR)]	245.69 (107.65–437.00)	269.39 (130.13–484.65)	258.39 (119.01–462.94)
Average daily energy intake, measured in kilocalories (mean±SD)	2,660.13±710.35	2,282.9±666.83	2,455.63±712.27
BMI, kg/m^2 (mean±SD)	22.48±2.90	22.67±3.14	22.58±3.03
WC, cm (mean±SD)	79.89±9.35	77.06±9.12	78.36±9.33
SBP, mmHg (mean±SD)	119.93±14.77	115.71±16.54	117.64±15.89
DBP, mmHg (mean±SD)	78.49±10.32	75.42±10.68	76.83±10.63

Note: Characteristics are described using either the median IQR or mean SD for continuous variables, and counts (proportions) for discrete variables.
Abbreviation: IQR=interquartile range; SD=standard deviation; CNY=Chinese Yuan; BMI=body mass index; WC=waist circumference; SBP=systolic blood pressure; DBP=diastolic blood pressure; MET=metabolic equivalent.

SUPPLEMENTARY TABLE S2. Associations between trajectory groups and T2D risk by sex.

Gender	Food group	Trajectory group	n	Model 1 HRs (95% CI)	Model 2 HRs (95% CI)	Model 3 HRs (95% CI)
Male (n=2,044)	Rice	Group 2	381	1	1	1
		Group 1	296	0.95 (0.58–1.53)	1.18 (0.72–1.94)	1.20 (0.70–2.03)
		Group 3	1,121	1.06 (0.75–1.52)	1.25 (0.87–1.80)	1.16 (0.76–1.77)
		Group 4	246	1.01 (0.62–1.63)	1.38 (0.83–2.28)	1.13 (0.58–2.22)
	Wheat	Group 2	1,158	1	1	1
		Group 1	351	1.13 (0.80– 1.60)	1.19 (0.83–1.68)	1.19 (0.82–1.73)
		Group 3	359	1.05 (0.73–1.51)	1.09 (0.76–1.57)	1.19 (0.72–1.98)
		Group 4	176	0.72 (0.41– 1.27)	0.84 (0.46–1.53)	1.22 (0.48– 3,09)
	Other grains	Group 1	722	1	1	1
		Group 2	950	0.72 (0.54–0.96)*	0.66 (0.49–0.89)*	0.60 (0.45–0.81)*
		Group 3	372	0.66 (0.45–0.98)*	0.63 (0.42–0.94)*	0.52 (0.33–0.84)*
	Multiple trajectories	Group 3	338	1	1	1
		Group 1	349	1.07 (0.68–1.71)	1.28 (0.80–2.06)	1.51 (0.93–2.45)
		Group 2	1,004	1.16 (0.79–1.71)	1.22 (0.82–1.80)	1.34 (0.91–2.00)
		Group 4	353	0.98 (0.61–1.60)	1.14 (0.70–1.86)	1.06 (0.65–1.73)
Female (n=2,420)	Rice	Group 2	540	1	1	1
		Group 1	387	1.07 (0.65– 1.74)	1.07 (0.65–1.77)	1.30 (0.77–2.22)
		Group 3	1,205	1.35 (0.93–1.97)	1.42 (0.97–2.07)	1.39 (0.90–2.14)
		Group 4	288	1.22 (0.73–2.04)	1.29 (0.76–2.21)	1.06 (0.54–2.08)
	Wheat	Group 2	1,319	1	1	1
		Group 1	433	0.94 (0.65– 1.35)	0.90 (0.62–1.31)	0.92 (0.62–1.39)
		Group 3	422	0.72 (0.47–1.09)	0.69 (0.45–1.04)	0.73 (0.43– 1.25)
		Group 4	246	0.99 (0.62–1.56)	1.01 (0.62–1.65)	1.39 (0.62–3.13)
	Other grains	Group 1	1,159	1	1	1
		Group 2	771	1.10 (0.81–1.49)	1.10 (0.81–1.50)	0.97 (0.71–1.33)
		Group 3	490	0.72 (0.48–1.08)	0.69 (0.46–1.04)	0.56 (0.34–0.90)*
	Multiple trajectories	Group 4	410	1	1	1
		Group 1	411	1.24 (0.75–2.04)	1.27 (0.76–2.11)	1.70 (1.01–2.85)*
		Group 2	1,140	1.27 (0.83–1.94)	1.31 (0.86–2.02)	1.56 (1.01–2.40)*
		Group 3	459	1.21 (0.74–1.97)	1.22 (0.74–2.01)	1.27 (0.77–2.10)

Note: Model 1 does not include any covariate adjustments. Model 2 incorporates adjustments for factors such as age, education level, geographic locality (urban or rural), urbanization index, annual household income per capita, levels of physical activity, current status of smoking and drinking, sleep duration, and medical history. Additionally, Model 3 includes adjustments for baseline intake of rice, wheat, and other grains, total energy intake, waist circumference, and systolic blood pressure.
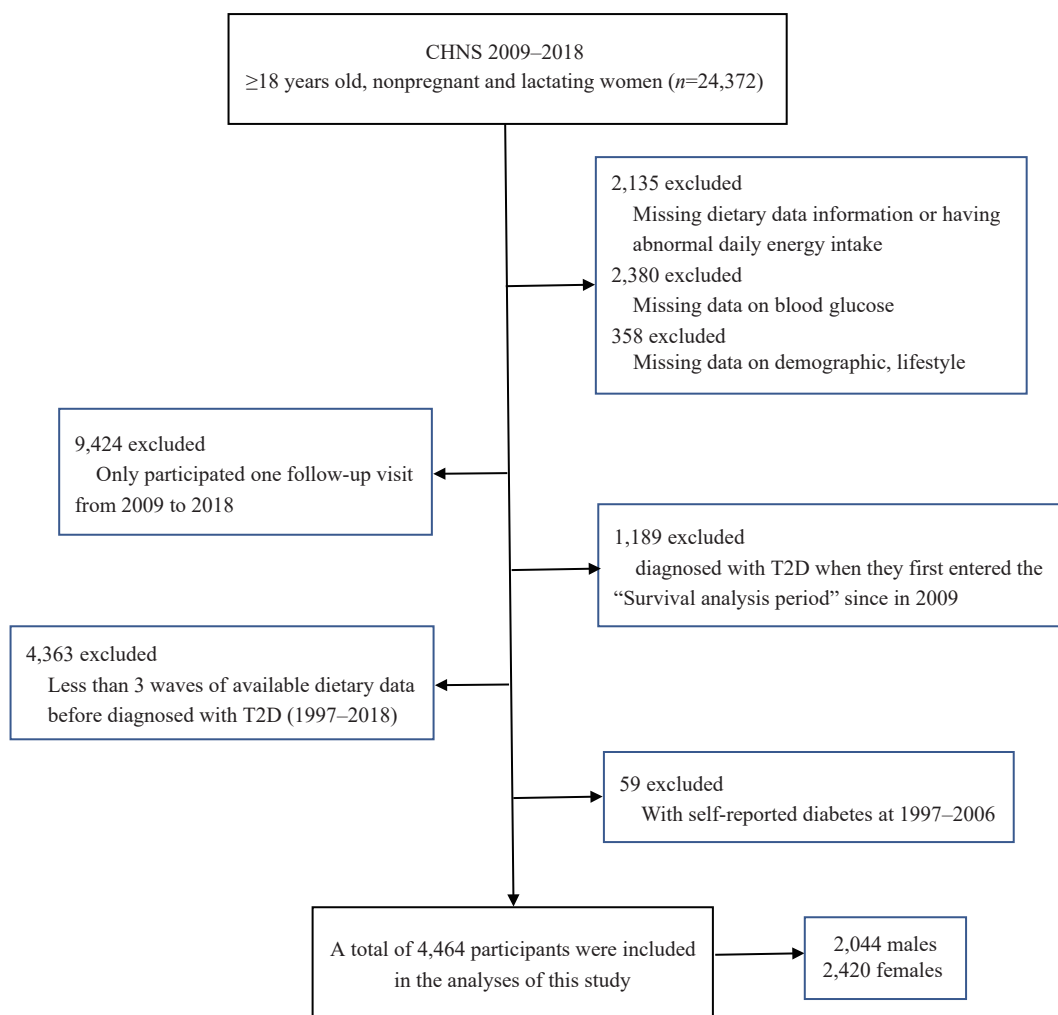Abbreviation: HR=hazard ratio; CI=confidence interval.
* $P < 0.05$.

SUPPLEMENTARY TABLE S3. Mean consumption of rice, wheat, and other grains among different multi-trajectory groups of males and females at follow-up.

Gender	Multiple trajectory groups	Cereal classification	1997 (mean, g/d)	2000 (mean, g/d)	2004 (mean, g/d)	2006 (mean, g/d)	2009 (mean, g/d)	2015 (mean, g/d)	2018 (mean, g/d)
Male	Group 1	Rice	545.39	496.19	509.82	488.37	456.84	390.93	381.42
		Wheat	9.95	8.65	15.94	29.12	24.62	30.20	39.20
		Other grains	2.71	6.77	13.23	4.96	18.71	26.59	9.48
	Group 2	Rice	398.09	361.54	351.89	315.66	319.15	283.79	280.72
		Wheat	83.12	82.38	101.55	102.86	90.45	95.92	109.76
		Other grains	13.38	8.16	11.27	10.07	11.05	14.24	9.83
	Group 3	Rice	215.02	186.16	205.23	191.45	196.02	167.47	176.34
		Wheat	257.21	229.13	197.24	196.62	193.43	184.80	194.02
		Other grains	102.28	61.68	64.73	43.72	50.36	45.95	73.84
	Group 4	Rice	49.45	43.55	36.52	39.57	46.30	62.05	53.96
		Wheat	565.21	462.55	476.14	492.98	436.12	366.58	353.83
		Other grains	56.99	54.56	41.06	38.91	36.45	68.68	65.95
Female	Group 1	Rice	484.38	452.08	474.38	426.10	385.30	320.54	313.62
		Wheat	12.34	10.97	19.54	27.16	26.37	29.60	42.17
		Other grains	2.09	9.31	16.57	11.15	17.09	23.21	8.64
	Group 2	Rice	352.92	306.99	306.46	275.61	257.36	238.75	233.26
		Wheat	81.37	72.44	83.62	86.09	79.74	84.69	88.82
		Other grains	12.26	7.12	11.27	8.72	10.93	12.17	9.82
	Group 3	Rice	46.60	41.01	33.26	35.21	39.81	60.92	53.18
		Wheat	460.78	385.89	389.30	395.07	370.94	300.36	277.36
		Other grains	53.44	46.37	39.99	34.68	36.16	66.66	59.92
	Group 4	Rice	192.79	171.88	179.27	169.52	159.62	148.62	146.94
		Wheat	195.72	178.24	163.80	166.36	156.99	145.67	156.91
		Other grains	125.43	59.38	56.28	46.62	47.13	43.88	75.98

Note: We found that group-based multi-trajectory modeling do effectively identify cereal-intake muti-trajectory groups.

SUPPLEMENTARY FIGURE S1. Flow chart outlining the inclusion of participants in the current study.
Abbreviation: CHNS=the China Health and Nutrition Survey; T2D=type 2 diabetes.