Associations between degree of food processing, inflammatory biomarkers and colorectal cancer survival: a prospective cohort study

List of Supplementary Tables

Table S1 Examples of food products in each food category according to the NOVA classification.

Food category	Food items
Unprocessed or minimally processed foods (NOVA1)	Light-green leafy vegetables (e.g., cabbage, baby napa cabbage, and cauliflower) Dark-green leafy vegetables (e.g., Chinese flowering cabbage, mustard greens, broccoli, and spinach) Fruit-vegetables (e.g., winter melon, cucumber, tomato, pepper, carrot, and radish) Root and tuber vegetables (e.g., potato, sweet potato, kudzu, Chinese yam, water chestnut, jicama, taro) Fruits (e.g., oranges, watermelon, apple, peach, strawberry, banana) Edible Fungi (e.g., mushrooms, wood ear fungus, white fungus, enoki mushroom) Sea food (e.g., finfish such as salmon and cod; crustaceans such as shrimp and crab; mollusks such as oysters and squid) Unprocessed red meat (e.g., raw beef, raw lamb) Poultry (e.g., raw chicken, raw duck) Animal organs (e.g., fresh and unprocessed liver, heart, kidney) Nuts (e.g., walnut, cashew, almond, pistachio) Egg (e.g., hen egg, quail egg) Soy (only dry soybeans and fresh edamame) Grains and their prepared forms (e.g., polished rice, cooked rice, porridge made with water) Milk
Processed culinary ingredients (NOVA2)	Plant oil, Animal fats
Processed foods (NOVA3)	Processed bread (e.g., white bread, whole-wheat bread, baguettes) Processed fish products (e.g., salted, smoked fish without additives) Alcoholic beverages (e.g., beer, wine) Soybean products (e.g., tofu - in soft, firm, or frozen forms, pressed tofu (dougan))
Ultra-processed foods (NOVA4)	Sugar-sweetened soft drinks (e.g., colas, lemon-lime sodas) Other sweetened beverages (e.g., fruit drinks, sports drinks) Ultra-processed breads (prepacked and branded) Ultra-processed ready-to-eat dishes (e.g., cha siu bao, pumpkin cakes, shumai, youtiao (fried dough stick), spring rolls) Ultra-rocessed fish products (canned fish products in sauces, brines, or with added flavors, e.g., canned dace with fermented black beans (typically containing flavour enhancers and colourants), canned sea fish in tomato or braised-style sauces with thickeners and stabilisers) Ultra-processed soybean Products (e.g., commercially prepared, flavored, and preserved bean curd products such as xianggan (savory baked tofu) and zhaiji (vegetarian chicken)) Preserved vegetables (e.g., suancai (Chinese pickled cabbage), zha cai (Sichuan pickled mustard tuber), mei cai (Chinese salted and fermented dried cabbage/pakchoi), which are traditional Chinese pickled or fermented foods) Pastries and sweet snacks (e.g., cakes, egg tarts, and walnut cookies) Processed meats (e.g., ham, sausages, hot dogs, bacon) Preserved egg (e.g., salted egg, century eggs) Dairy products (e.g., cheese, yogurt) Biscuits (cookies) Frozen desserts (e.g., ice cream) Soymilk Milk powder

Table S2 Baseline characteristics of cancer survivors by quartiles of NOVA 2 foods intake.

Characteristics	Q1 (n=671)	Q2 (n=680)	Q3 (n=734)	Q4 (n=714)	*P*
Age at diagnosis (years), median (P_{25}, P_{75}) [a]	57.67 (48.49, 64.22)	59.35 (50.12, 66.02)	58.58 (50.27, 64.96)	58.16 (49.91, 64.88)	0.129
Male, (n, %) [a]	382 (56.9)	357 (52.5)	408 (55.6)	456 (63.9)	<0.001
Income, Yuan/month, (n, %) [a]					<0.001
Less than 2000	77 (11.5)	90 (13.2)	97 (13.2)	115 (16.1)	
2001–5000	180 (26.8)	207 (30.4)	272 (37.1)	276 (38.7)	
5001–8000	183 (27.3)	233 (34.3)	222 (30.2)	192 (26.9)	
More than 8001	231 (34.4)	150 (22.1)	143 (19.5)	131 (18.3)	
BMI (kg/m^2) (n, %) [a]					<0.001
< 24.0	427 (63.6)	422 (62.1)	438 (59.7)	379 (53.1)	
24-28	209 (31.1)	207 (30.4)	245 (33.4)	263 (36.8)	
≥ 28	35 (5.2)	51 (7.5)	51 (6.9)	72 (10.1)	
Physical activity (MET-hours/week), median (P_{25}, P_{75}) [a]	28.88 (6.75, 52.50)	31.50 (13.13, 52.50)	26.25 (7.88, 52.50)	26.25 (6.75, 52.26)	<0.001
Smoking status (n, %) [a]	253 (37.7)	245 (36.0)	282 (38.4)	323 (45.2)	0.002
Alcohol consumption (n, %) [a]	101 (15.1)	107 (15.7)	125 (17.0)	171 (23.9)	<0.001
Energy (kcal/day), median (P_{25}, P_{75}) [a, b]	1508.76 (1239.88, 1856.58)	1461.97 (1190.56, 1793.47)	1415.60 (1113.81, 1737.09)	1555.06 (1239.60, 1881.79)	<0.001
Energy-adjusted NOVA 1 foods (g/day), median (P_{25}, P_{75}), [a, b]	992.42 (820.76, 1192.04)	964.97 (778.48, 1208.14)	930.25 (746.98, 1152.96)	926.23 (768.56, 1150.62)	<0.001
Energy-adjusted NOVA 2 foods (g/day), median (P_{25}, P_{75}) [a, b]	6.67 (0.00, 10.42)	18.37 (15.33, 20.83)	26.10 (23.75, 28.33)	35.59 (32.20, 41.67)	<0.001
Energy-adjusted NOVA 3 foods (g/day), median (P_{25}, P_{75}) [a, b]	79.05 (36.14, 135.25)	82.19 (41.63, 150.00)	78.57 (33.94, 150.00)	91.51 (42.68, 161.52)	0.012
Energy-adjusted NOVA 4 foods (g/day), median	45.76 (23.40, 89.20)	43.38 (19.00, 85.00)	33.81 (11.92, 70.35)	41.76 (19.63, 85.32)	<0.001

(P_{25}, P_{75}) [a, b]					
Family history of cancer in first-degree relatives (n, %) [a]	103 (15.4)	99 (14.6)	109 (14.9)	105 (14.7)	0.979
Cancer stage (n, %) [a]					0.043
I	119 (17.7)	98 (14.4)	116 (15.8)	89 (12.5)	
II	214 (31.9)	230 (33.8)	258 (35.1)	243 (34.0)	
III	206 (30.7)	224 (32.9)	255 (34.7)	245 (34.3)	
IV	123 (18.3)	121 (17.8)	96 (13.1)	121 (16.9)	
Unknown	9 (1.3)	7 (1.0)	9 (1.2)	16 (2.2)	
Cancer site (n, %) [a]					<0.001
Colon	440 (65.6)	438 (64.4)	506 (68.9)	409 (57.3)	
Rectum	231 (34.4)	242 (35.6)	228 (31.1)	305 (42.7)	
Tumor differentiation (n, %) [a]					0.764
Well	5 (0.7)	6 (0.9)	7 (1.0)	6 (0.8)	
Moderate	499 (74.4)	488 (71.8)	537 (73.2)	542 (75.9)	
Poor	128 (19.1)	152 (22.4)	154 (21.0)	128 (17.9)	
Unknown	39 (5.8)	34 (5.0)	36 (4.9)	38 (5.3)	
Surgery, n (%) [a]	647 (96.4)	649 (95.4)	707 (96.3)	672 (94.1)	0.126
Radiotherapy or chemotherapy (n, %) [a]	461 (68.7)	457 (67.2)	458 (62.4)	461 (64.6)	0.062

Abbreviations: BMI, body mass index. MET, metabolic equivalent task. NOVA 1: unprocessed/minimally processed foods; NOVA 2: processed culinary ingredients; NOVA 3: processed foods; NOVA 4: ultra-processed foods. Q: quartile.

[a] Continuous variables were assessed by Wilcoxon rank-sum tests. Categorical variables were evaluated by χ^2 tests.

[b] Adjust food and nutrient intake using energy residual method.

Table S3 Baseline characteristics of cancer survivors by quartiles of NOVA 3 foods intake.

Characteristics	Q1 (n=699)	Q2 (n=698)	Q3 (n=702)	Q4 (n=700)	*P*
Age at diagnosis (years), median (P_{25}, P_{75}) [a]	59.12 (50.53, 64.71)	57.55 (48.12, 64.85)	58.85 (50.22, 65.57)	58.12 (50.02, 65.11)	0.157
Male, (n, %) [a]	321 (45.9)	348 (49.9)	405 (57.7)	529 (75.6)	<0.001
Income, Yuan/month, (n, %) [a]					<0.001
Less than 2000	123 (17.6)	72 (10.3)	86 (12.3)	98 (14.0)	
2001–5000	259 (37.1)	240 (34.4)	216 (30.8)	220 (31.4)	
5001–8000	205 (29.3)	199 (28.5)	215 (30.6)	211 (30.1)	
More than 8001	112 (16.0)	187 (26.8)	185 (26.4)	171 (24.4)	
BMI (kg/m^2) (n, %) [a]					0.060
< 24.0	442 (63.2)	412 (59.0)	425 (60.5)	387 (55.3)	
24-28	210 (30.0)	239 (34.2)	228 (32.5)	247 (35.3)	
≥ 28	47 (6.7)	47 (6.7)	49 (7.0)	66 (9.4)	
Physical activity (MET-hours/week), median (P_{25}, P_{75}) [a]	37.13 (10.97, 52.50)	26.97 (10.50, 52.50)	28.88 (9.63, 52.50)	20.75 (5.25, 47.34)	<0.001
Smoking status (n, %) [a]	232 (33.2)	225 (32.2)	265 (37.7)	381 (54.4)	<0.001
Alcohol consumption (n, %) [a]	31 (4.4)	57 (8.2)	102 (14.5)	314 (44.9)	<0.001
Energy (kcal/day), median (P_{25}, P_{75}) [a, b]	1326.50 (1061.92, 1630.74)	1371.48 (1132.88, 1673.49)	1499.77 (1256.62, 1811.06)	1731.21 (1420.76, 2060.98)	<0.001
Energy-adjusted NOVA 1 foods (g/day), median (P_{25}, P_{75}), [a, b]	903.52 (736.36, 1106.38)	941.47 (766.22, 1150.40)	982.35 (803.55, 1197.30)	996.04 (809.09, 1225.02)	<0.001
Energy-adjusted NOVA 2 foods (g/day), median (P_{25}, P_{75}) [a, b]	23.00 (12.72, 29.10)	23.00 (13.33, 29.10)	22.50 (13.03, 30.00)	24.00 (15.00, 32.20)	0.002
Energy-adjusted NOVA 3 foods (g/day), median (P_{25}, P_{75}) [a, b]	17.24 (7.92, 28.28)	62.71 (50.40, 72.13)	110.71 (96.14, 128.88)	214.54 (169.66, 300.00)	<0.001
Energy-adjusted NOVA 4 foods (g/day), median	29.33 (11.50, 62.64)	44.54 (21.55, 84.78)	47.40 (23.92, 90.12)	42.92 (18.61, 93.65)	<0.001

(P_{25}, P_{75}) [a, b]					
Family history of cancer in first-degree relatives (n, %) [a]	92 (13.2)	114 (16.3)	101 (14.4)	109 (15.6)	0.363
Cancer stage (n, %) [a]					0.045
I	110 (15.7)	111 (15.9)	120 (17.1)	81 (11.6)	
II	246 (35.2)	229 (32.8)	213 (30.3)	257 (36.7)	
III	238 (34.0)	223 (31.9)	244 (34.8)	225 (32.1)	
IV	97 (13.9)	123 (17.6)	118 (16.8)	123 (17.6)	
Unknown	8 (1.1)	12 (1.7)	7 (1.0)	14 (2.0)	
Cancer site (n, %) [a]					0.424
Colon	431 (61.7)	459 (65.8)	455 (64.8)	448 (64.0)	
Rectum	268 (38.3)	239 (34.2)	247 (35.2)	252 (36.0)	
Tumor differentiation (n, %) [a]					0.630
Well	5 (0.7)	8 (1.1)	7 (1.0)	4 (0.6)	
Moderate	519 (74.2)	519 (74.4)	516 (73.5)	512 (73.1)	
Poor	137 (19.6)	142 (20.3)	133 (18.9)	150 (21.4)	
Unknown	38 (5.4)	29 (4.2)	46 (6.6)	34 (4.9)	
Surgery, n (%) [a]	670 (95.9)	671 (96.1)	673 (95.9)	661 (94.4)	0.399
Radiotherapy or chemotherapy (n, %) [a]	448 (64.1)	479 (68.6)	448 (63.8)	462 (66.0)	0.206

Abbreviations: BMI, body mass index. MET, metabolic equivalent task. NOVA 1: unprocessed/minimally processed foods; NOVA 2: processed culinary ingredients; NOVA 3: processed foods; NOVA 4: ultra-processed foods. Q: quartile.

[a] Continuous variables were assessed by Wilcoxon rank-sum tests. Categorical variables were evaluated by χ^2 tests.

[b] Adjust food and nutrient intake using energy residual method.

Table S4 Baseline characteristics of cancer survivors by quartiles of NOVA 4 foods intake.

Characteristics	Q1 (n=699)	Q2 (n=698)	Q3 (n=702)	Q4 (n=700)	*P*
Age at diagnosis (years), median (P_{25}, P_{75}) [a]	60.20 (52.79, 66.06)	59.97 (52.10, 65.79)	57.69 (48.57, 64.35)	54.93 (45.71, 63.28)	<0.001
Male, (n, %) [a]	396 (56.6)	419 (59.9)	377 (53.9)	411 (58.7)	0.106
Income, Yuan/month, (n, %) [a]					<0.001
Less than 2000	131 (18.7)	102 (14.6)	89 (12.7)	57 (8.1)	
2001–5000	303 (43.3)	253 (36.2)	199 (28.4)	180 (25.7)	
5001–8000	169 (24.1)	187 (26.8)	234 (33.4)	240 (34.3)	
More than 8001	97 (13.9)	157 (22.5)	178 (25.4)	223 (31.9)	
BMI (kg/m^2) (n, %) [a]					0.52
< 24.0	428 (61.1)	408 (58.4)	423 (60.4)	407 (58.1)	
24-28	221 (31.6)	246 (35.2)	218 (31.1)	239 (34.1)	
≥ 28	51 (7.3)	45 (6.4)	59 (8.4)	54 (7.7)	
Physical activity (MET-hours/week), median (P_{25}, P_{75}) [a]	28.88 (8.77, 52.50)	28.88 (10.59, 52.50)	28.88 (6.75, 52.50)	25.88 (6.81, 50.62)	0.077
Smoking status (n, %) [a]	294 (42.0)	288 (41.2)	270 (38.6)	251 (35.9)	0.078
Alcohol consumption (n, %) [a]	112 (16.0)	122 (17.5)	114 (16.3)	156 (22.3)	0.007
Energy (kcal/day), median (P_{25}, P_{75}) [a, b]	1329.28 (1046.78, 1665.59)	1429.86 (1171.02, 1746.23)	1478.34 (1228.98, 1822.59)	1661.28 (1376.06, 1986.86)	<0.001
Energy-adjusted NOVA 1 foods (g/day), median (P_{25}, P_{75}), [a, b]	854.89 (691.07, 1032.52)	930.09 (751.95, 1134.64)	996.69 (823.99, 1183.65)	1054.93 (863.57, 1293.18)	<0.001
Energy-adjusted NOVA 2 foods (g/day), median (P_{25}, P_{75}) [a, b]	23.75 (15.62, 29.17)	23.50 (13.33, 30.00)	22.50 (12.67, 29.75)	22.50 (12.50, 30.70)	0.03
Energy-adjusted NOVA 3 foods (g/day), median (P_{25}, P_{75}) [a, b]	68.73 (21.21, 150.77)	83.28 (41.19, 151.49)	80.96 (39.17, 137.11)	96.43 (56.71, 164.41)	<0.001
Energy-adjusted NOVA 4 foods (g/day),	8.94 (3.39, 13.21)	29.04 (23.52, 35.32)	58.66 (48.64, 69.36)	126.92 (99.75, 176.15)	<0.001

median (P_{25}, P_{75}) [a, b]					
Family history of cancer in first-degree relatives (n, %) [a]	83 (11.9)	100 (14.3)	103 (14.7)	130 (18.6)	0.005
Cancer stage (n, %) [a]					0.008
I	118 (16.9)	107 (15.3)	107 (15.3)	90 (12.9)	
II	265 (37.9)	237 (33.9)	213 (30.4)	230 (32.9)	
III	211 (30.1)	250 (35.8)	234 (33.4)	235 (33.6)	
IV	99 (14.1)	94 (13.4)	135 (19.3)	133 (19.0)	
Unknown	7 (1.0)	11 (1.6)	11 (1.6)	12 (1.7)	
Cancer site (n, %) [a]					0.087
Colon	462 (66.0)	426 (60.9)	466 (66.6)	439 (62.7)	
Rectum	238 (34.0)	273 (39.1)	234 (33.4)	261 (37.3)	
Tumor differentiation (n, %) [a]					0.263
Well	7 (1.0)	5 (0.7)	5 (0.7)	7 (1.0)	
Moderate	526 (75.1)	535 (76.5)	513 (73.3)	492 (70.3)	
Poor	137 (19.6)	127 (18.2)	146 (20.9)	152 (21.7)	
Unknown	30 (4.3)	32 (4.6)	36 (5.1)	49 (7.0)	
Surgery, n (%) [a]	671 (95.9)	668 (95.6)	668 (95.4)	668 (95.4)	0.977
Radiotherapy or chemotherapy (n, %) [a]	417 (59.6)	456 (65.2)	478 (68.3)	486 (69.4)	<0.001

Abbreviations: BMI, body mass index. MET, metabolic equivalent task. NOVA 1: unprocessed/minimally processed foods; NOVA 2: processed culinary ingredients; NOVA 3: processed foods; NOVA 4: ultra-processed foods. Q: quartile.

[a] Continuous variables were assessed by Wilcoxon rank-sum tests. Categorical variables were evaluated by χ^2 tests.

[b] Adjust food and nutrient intake using energy residual method.

Table S5 Percentile-based isotemporal substitution analyses (10-percentile change [a]).

Outcome	Substitution Scenario	HRs (95% CI s) b, c, d	P
Overall survival	Replacing NOVA 4 with NOVA 1	0.965 (0.931, 0.999)	0.046
	Replacing NOVA 3 with NOVA 1	0.968 (0.935, 1.003)	0.070
Colorectal cancer-specific survival	Replacing NOVA 4 with NOVA 1	0.957 (0.922, 0.993)	0.020
	Replacing NOVA 3 with NOVA 1	0.963 (0.929, 0.999)	0.046
Recurrence- or metastasis-free survival	Replacing NOVA 4 with NOVA 1	0.983 (0.946, 1.022)	0.383
	Replacing NOVA 3 with NOVA 1	0.984 (0.947, 1.022)	0.405

Abbreviations: NOVA 1: unprocessed/minimally processed foods; NOVA 3: processed foods; NOVA 4: ultra-processed foods.

[a] Intake percentiles by NOVA category: Unprocessed/minimally processed foods (NOVA1) - 10th: 608.5, 25th: 776.9, 50th: 954.4, 75th: 1176.2, 90th: 1429.7; Processed foods (NOVA3) - 10th: 13.5, 25th: 38.9, 50th: 82.5, 75th: 151.2, 90th: 235.0; Ultra-processed foods (NOVA4) - 10th: 7.1, 25th: 18.1, 50th: 41.3, 75th: 82.0, 90th: 145.4.

[b] Model adjusted for age at diagnosis, sex, BMI, smoking status, drinking status, MET, total energy intake, TNM stage, cancer site, tumor differentiation, surgery, radiotherapy or chemotherapy, and family history of cancer in first-degree relatives.

[c] Models estimate the effect of substituting 25 grams of one NOVA category with 25 grams of another.

[d] Three decimal places are used for HRs to preserve statistical precision of borderline significant findings.

Table S6 Hazard ratios (95% confidence intervals) for survival outcomes according to daily intake of NOVA 1–4 food groups (g/day) in the Guangdong Colorectal Cancer Cohort Study (further adjusted for a Dietary Guideline Adherence Score based on the Chinese Dietary Guidelines).

	Q1	Q2	Q3	Q4	*P*-Trend [b]
Overall survival [a]					
NOVA 1	Ref.	0.86 (0.69, 1.07)	0.92 (0.73, 1.17)	0.72 (0.54, 0.95)	0.051
NOVA 2	Ref.	0.94 (0.77, 1.16)	0.83 (0.67, 1.04)	0.93 (0.76, 1.14)	0.588
NOVA 3	Ref.	1.09 (0.88, 1.36)	1.03 (0.82, 1.28)	0.92 (0.72, 1.16)	0.077
NOVA 4	Ref.	0.98 (0.78, 1.21)	1.10 (0.88, 1.37)	1.05 (0.83, 1.32)	0.401
Colorectal cancer-specific survival [a]					
NOVA 1	Ref.	0.85 (0.68, 1.07)	0.87 (0.68, 1.12)	0.71 (0.52, 0.95)	0.036
NOVA 2	Ref.	0.94 (0.76, 1.17)	0.86 (0.68, 1.08)	0.90 (0.72, 1.12)	0.536
NOVA 3	Ref.	1.05 (0.83, 1.31)	0.96 (0.76, 1.21)	0.83 (0.64, 1.06)	0.012
NOVA 4	Ref.	1.06 (0.84, 1.33)	1.15 (0.92, 1.45)	1.08 (0.85, 1.38)	0.622
Recurrence- or metastasis-free survival [a]					
NOVA 1	Ref.	0.99 (0.77, 1.27)	1.10 (0.84, 1.44)	0.92 (0.67, 1.26)	0.941
NOVA 2	Ref.	1.24 (0.98, 1.57)	0.99 (0.77, 1.27)	1.00 (0.79, 1.28)	0.962
NOVA 3	Ref.	1.10 (0.86, 1.40)	0.98 (0.77, 1.26)	0.98 (0.75, 1.28)	0.287
NOVA 4	Ref.	1.17 (0.91, 1.51)	1.08 (0.84, 1.40)	1.33 (1.03, 1.73)	0.138

Abbreviations: NOVA 1: unprocessed/minimally processed foods; NOVA 2: processed culinary ingredients; NOVA 3: processed foods; NOVA 4: ultra-processed foods. Q: quartile.

[a] Model adjusted for age at diagnosis, sex, BMI, smoking status, alcohol consumption, physical activity, total energy intake, cancer stage, cancer site, tumor differentiation, surgery, radiotherapy or chemotherapy, history of cancer in first-degree relatives and a Dietary Guideline Adherence Score based on the Chinese Dietary Guidelines.

[b] Test for linear trend was based on the median values for each quartile.

Table S7 Hazard ratios (95% confidence intervals) for survival outcomes according to daily intake of NOVA 1–4 food groups (% energy) in the Guangdong Colorectal Cancer Cohort study.

	Q1	Q2	Q3	Q4	*P-Trend*[a]
Overall survival					
NOVA 1					
Event/Number	170/700	184/699	173/700	188/700	
Crude model	Ref.	1.09 (0.88, 1.34)	0.99 (0.80, 1.22)	1.07 (0.87, 1.32)	0.722
Adjusted model 1[b]	Ref.	1.11 (0.90, 1.37)	1.01 (0.82, 1.25)	1.02 (0.83, 1.26)	0.932
Adjusted model 2[c]	Ref.	1.06 (0.86, 1.31)	1.03 (0.83, 1.28)	1.10 (0.89, 1.36)	0.453
NOVA 2					
Event/Number	199/700	174/699	162/700	180/700	
Crude model	Ref.	0.96 (0.79, 1.18)	0.89 (0.73, 1.10)	1.02 (0.83, 1.25)	0.942
Adjusted model 1[b]	Ref.	0.97 (0.79, 1.19)	0.89 (0.72, 1.09)	1.00 (0.82, 1.23)	0.816
Adjusted model 2[c]	Ref.	1.03 (0.84, 1.27)	0.92 (0.75, 1.14)	0.95 (0.77, 1.17)	0.410
NOVA 3					
Event/Number	180/700	181/699	186/700	168/700	
Crude model	Ref.	1.01 (0.82, 1.24)	1.06 (0.86, 1.30)	0.94 (0.76, 1.16)	0.690
Adjusted model 1[b]	Ref.	1.07 (0.87, 1.32)	1.13 (0.92, 1.39)	0.98 (0.79, 1.21)	0.969
Adjusted model 2[c]	Ref.	0.99 (0.80, 1.23)	1.03 (0.84, 1.28)	0.88 (0.71, 1.09)	0.328
NOVA 4					
Event/Number	164/700	185/699	198/700	168/700	
Crude model	Ref.	1.08 (0.88, 1.33)	1.22 (0.99, 1.50)	0.98 (0.79, 1.21)	0.880
Adjusted model 1[b]	Ref.	1.09 (0.88, 1.35)	1.27 (1.03, 1.56)	1.05 (0.84, 1.30)	0.396
Adjusted model 2[c]	Ref.	1.01 (0.82, 1.25)	1.16 (0.94, 1.43)	1.00 (0.80, 1.24)	0.730
Colorectal cancer-specific survival					
NOVA 1					
Event/Number	142/700	169/699	164/700	172/700	
Crude model	Ref.	1.19 (0.96, 1.49)	1.13 (0.90, 1.41)	1.18 (0.94, 1.47)	0.236
Adjusted model 1[b]	Ref.	1.22 (0.97, 1.52)	1.15 (0.92, 1.44)	1.13 (0.90, 1.41)	0.429
Adjusted model 2[c]	Ref.	1.16 (0.93, 1.46)	1.17 (0.93, 1.47)	1.18 (0.94, 1.48)	0.087
NOVA 2					
Event/Number	178/700	153/699	146/700	170/700	
Crude model	Ref.	0.93 (0.75, 1.15)	0.88 (0.71, 1.09)	1.05 (0.85, 1.30)	0.798
Adjusted model 1[b]	Ref.	0.94 (0.75, 1.16)	0.88 (0.70, 1.09)	1.04 (0.84, 1.29)	0.875
Adjusted model 2[c]	Ref.	1.01 (0.81, 1.27)	0.92 (0.74, 1.15)	0.99 (0.80, 1.24)	0.720
NOVA 3					
Event/Number	168/700	149/699	166/700	144/700	
Crude model	Ref.	1.01 (0.82, 1.25)	1.01 (0.81, 1.25)	0.86 (0.69, 1.08)	0.229
Adjusted model 1[b]	Ref.	1.06 (0.86, 1.32)	1.07 (0.86, 1.32)	0.89 (0.71, 1.12)	0.373
Adjusted model 2[c]	Ref.	0.97 (0.78, 1.21)	0.96 (0.77, 1.20)	0.80 (0.64, 1.00)	0.061
NOVA 4					
Event/Number	146/700	164/699	182/700	155/700	
Crude model	Ref.	1.09 (0.87, 1.36)	1.26 (1.02, 1.57)	1.02 (0.82, 1.28)	0.550
Adjusted model 1[b]	Ref.	1.09 (0.87, 1.37)	1.30 (1.05, 1.63)	1.08 (0.86, 1.36)	0.264

Adjusted model 2[c]	Ref.	1.02 (0.81, 1.27)	1.23 (0.98, 1.55)	1.02 (0.81, 1.29)	0.562
Recurrence- or metastasis-free survival					
NOVA 1					
Event/Number	134/700	149/699	137/700	137/700	
Crude model	Ref.	1.14 (0.90, 1.44)	1.03 (0.81, 1.30)	1.02 (0.80, 1.29)	0.883
Adjusted model 1[b]	Ref.	1.10 (0.87, 1.40)	1.00 (0.78, 1.26)	1.00 (0.78, 1.27)	0.747
Adjusted model 2[c]	Ref.	1.14 (0.90, 1.44)	0.97 (0.76, 1.23)	1.09 (0.86, 1.39)	0.825
NOVA 2					
Event/Number	159/700	149/699	137/700	137/700	
Crude model	Ref.	0.85 (0.67, 1.07)	0.82 (0.65, 1.04)	0.93 (0.74, 1.17)	0.472
Adjusted model 1[b]	Ref.	0.86 (0.68, 1.09)	0.84 (0.67, 1.07)	0.97 (0.77, 1.22)	0.725
Adjusted model 2[c]	Ref.	0.93 (0.74, 1.18)	0.89 (0.70, 1.13)	1.04 (0.82, 1.31)	0.922
NOVA 3					
Event/Number	133/700	140/699	145/700	139/700	
Crude model	Ref.	1.05 (0.83, 1.33)	1.10 (0.87, 1.40)	1.04 (0.82, 1.32)	0.663
Adjusted model 1[b]	Ref.	1.01 (0.80, 1.29)	1.09 (0.86, 1.39)	1.04 (0.82, 1.32)	0.614
Adjusted model 2[c]	Ref.	0.93 (0.73, 1.18)	0.99 (0.78, 1.26)	0.98 (0.77, 1.24)	0.983
NOVA 4					
Event/Number	134/700	141/699	139/700	143/700	
Crude model	Ref.	1.03 (0.81, 1.31)	1.05 (0.83, 1.34)	1.06 (0.84, 1.34)	0.596
Adjusted model 1[b]	Ref.	1.00 (0.79, 1.27)	1.02 (0.80, 1.29)	1.02 (0.80, 1.30)	0.838
Adjusted model 2[c]	Ref.	0.98 (0.77, 1.24)	0.93 (0.73, 1.19)	0.95 (0.75, 1.21)	0.599

Abbreviations: NOVA 1: unprocessed or minimally processed foods; NOVA 2: processed culinary ingredients; NOVA 3: processed foods; NOVA 4: ultra-processed foods. Q: quartile.

[a] Test for linear trend was based on the median values for each quartile.

[b] Model 1 adjusted for age at diagnosis, sex, BMI, smoking status, alcohol consumption, physical activity.

[c] Model 2 additionally adjusted for cancer stage, cancer site, tumor differentiation, surgery, radiotherapy or chemotherapy, and family history of cancer in first-degree relatives.

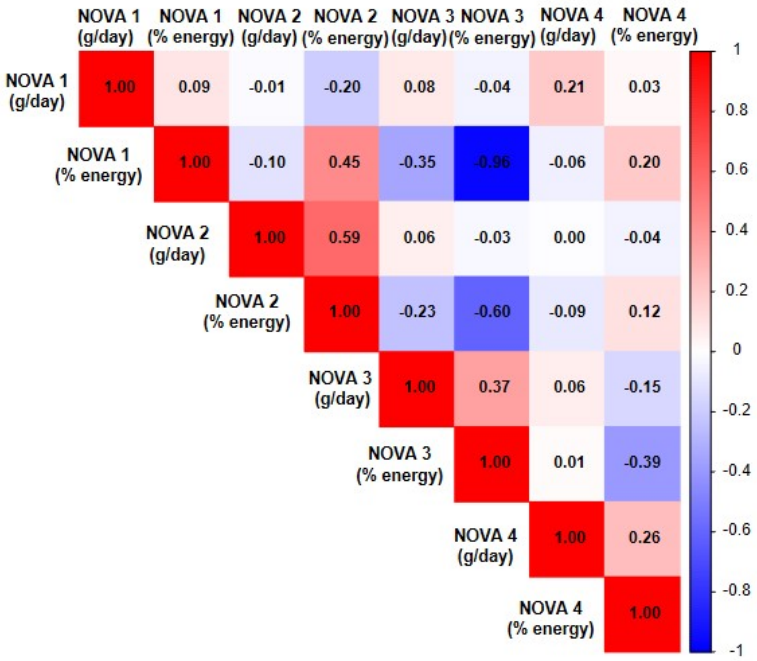

Figure S1 Correlation between grams per day and % energy across NOVA 1-4 food groups.

Abbreviations: NOVA 1: unprocessed or minimally processed foods; NOVA 2: processed culinary ingredients; NOVA 3: processed foods; NOVA 4: ultra-processed foods.

Table S8 Cross-classification of NOVA 1-4 food group intake quartiles by metric.

	% energy Q1	% energy Q2	% energy Q3	% energy Q4
NOVA 1				
Q1 (g/day)	242	180	164	14
Q2 (g/day)	158	170	178	193
Q3 (g/day)	131	156	206	207
Q1 (g/day)	169	193	152	186
NOVA 2				
Q1 (g/day)	498	145	44	13
Q2 (g/day)	126	243	201	129
Q3 (g/day)	41	202	243	214
Q1 (g/day)	6	90	246	358
NOVA 3				
Q1 (g/day)	503	96	37	64
Q2 (g/day)	185	318	112	85
Q3 (g/day)	11	258	303	128
Q1 (g/day)	0	26	250	424
NOVA 4				
Q1 (g/day)	429	191	61	19
Q2 (g/day)	117	264	210	108
Q3 (g/day)	52	156	267	225
Q1 (g/day)	102	88	162	348

Abbreviations: NOVA 1: unprocessed or minimally processed foods; NOVA 2: processed culinary ingredients; NOVA 3: processed foods; NOVA 4: ultra-processed foods. Q: quartile.

Table S9 Hazard ratios (95% confidence intervals) for survival outcomes according to daily intake of NOVA 1–4 food groups (g/day) in the Guangdong Colorectal Cancer Cohort Study (excluding participants with a family history of cancer in first-degree relatives).

	Q1	Q2	Q3	Q4	*P*-Trend [b]
Overall survival [a]					
NOVA 1	Ref.	0.86 (0.68, 1.08)	0.90 (0.70, 1.15)	0.69 (0.52, 0.93)	0.034
NOVA 2	Ref.	0.95 (0.76, 1.18)	0.82 (0.64, 1.04)	0.85 (0.68, 1.06)	0.084
NOVA 3	Ref.	1.19 (0.94, 1.51)	1.09 (0.85, 1.38)	0.94 (0.72, 1.21)	0.498
NOVA 4	Ref.	0.99 (0.79, 1.26)	1.19 (0.94, 1.50)	1.08 (0.84, 1.38)	0.317
Colorectal cancer-specific survival [a]					
NOVA 1	Ref.	0.85 (0.67, 1.09)	0.87 (0.67, 1.13)	0.70 (0.51, 0.95)	0.041
NOVA 2	Ref.	0.94 (0.74, 1.18)	0.83 (0.65, 1.07)	0.80 (0.63, 1.02)	0.043
NOVA 3	Ref.	1.12 (0.88, 1.42)	0.99 (0.77, 1.27)	0.82 (0.63, 1.08)	0.114
NOVA 4	Ref.	1.09 (0.85, 1.40)	1.21 (0.94, 1.56)	1.08 (0.83, 1.41)	0.417
Recurrence- or metastasis-free survival [a]					
NOVA 1	Ref.	0.95 (0.72, 1.25)	1.02 (0.77, 1.35)	0.86 (0.62, 1.20)	0.503
NOVA 2	Ref.	1.18 (0.92, 1.52)	1.00 (0.76, 1.30)	0.99 (0.76, 1.28)	0.623
NOVA 3	Ref.	1.05 (0.81, 1.37)	0.96 (0.73, 1.26)	0.97 (0.72, 1.29)	0.674
NOVA 4	Ref.	1.24 (0.94, 1.62)	1.08 (0.82, 1.42)	1.28 (0.96, 1.69)	0.206

Abbreviations: NOVA 1: unprocessed/minimally processed foods; NOVA 2: processed culinary ingredients; NOVA 3: processed foods; NOVA 4: ultra-processed foods. Q: quartile.

[a] Model adjusted for age at diagnosis, sex, BMI, smoking status, alcohol consumption, physical activity, total energy intake, cancer stage, cancer site, tumor differentiation, surgery, radiotherapy or chemotherapy.

[b] Test for linear trend was based on the median values for each quartile.

Table S10 Hazard ratios (95% confidence intervals) for survival outcomes according to daily intake of NOVA 1–4 food groups (g/day) in the Guangdong Colorectal Cancer Cohort Study (excluding participants who died within 180 days after cancer diagnosis).

	Q1	Q2	Q3	Q4	*P*-Trend [b]
Overall survival [a]					
NOVA 1	Ref.	0.86 (0.68, 1.09)	0.89 (0.70, 1.15)	0.69 (0.51, 0.94)	0.035
NOVA 2	Ref.	0.97 (0.77, 1.21)	0.87 (0.68, 1.12)	1.01 (0.81, 1.26)	0.934
NOVA 3	Ref.	1.12 (0.89, 1.42)	1.00 (0.78, 1.27)	0.89 (0.69, 1.15)	0.265
NOVA 4	Ref.	0.99 (0.78, 1.25)	1.11 (0.87, 1.41)	1.18 (0.92, 1.51)	0.128
Colorectal cancer-specific survival [a]					
NOVA 1	Ref.	0.85 (0.67, 1.09)	0.83 (0.64, 1.09)	0.68 (0.50, 0.94)	0.025
NOVA 2	Ref.	0.94 (0.74, 1.20)	0.91 (0.70, 1.18)	0.97 (0.77, 1.23)	0.802
NOVA 3	Ref.	1.05 (0.82, 1.35)	0.91 (0.71, 1.18)	0.77 (0.59, 1.01)	0.037
NOVA 4	Ref.	1.09 (0.85, 1.41)	1.17 (0.91, 1.52)	1.23 (0.95, 1.61)	0.103
Recurrence- or metastasis-free survival [a]					
NOVA 1	Ref.	0.91 (0.69, 1.19)	0.98 (0.74, 1.29)	0.81 (0.59, 1.13)	0.326
NOVA 2	Ref.	1.32 (1.03, 1.70)	1.11 (0.84, 1.45)	1.11 (0.86, 1.45)	0.766
NOVA 3	Ref.	1.13 (0.87, 1.47)	0.94 (0.71, 1.23)	0.95 (0.71, 1.27)	0.461
NOVA 4	Ref.	1.10 (0.84, 1.43)	0.99 (0.75, 1.31)	1.23 (0.93, 1.62)	0.230

Abbreviations: NOVA 1: unprocessed/minimally processed foods; NOVA 2: processed culinary ingredients; NOVA 3: processed foods; NOVA 4: ultra-processed foods. Q: quartile.

[a] Model adjusted for age at diagnosis, sex, BMI, smoking status, alcohol consumption, physical activity, total energy intake, cancer stage, cancer site, tumor differentiation, surgery, radiotherapy or chemotherapy, and family history of cancer in first-degree relatives.

[b] Test for linear trend was based on the median values for each quartile.

Table S11 Hazard ratios (95% confidence intervals) for survival outcomes according to daily intake of NOVA 1–4 food groups (g/day) in the Guangdong Colorectal Cancer Cohort Study (excluding participants with cancer stage IV).

	Q1	Q2	Q3	Q4	*P*-Trend [b]
Overall survival [a]					
NOVA 1	Ref.	0.89 (0.66, 1.21)	0.90 (0.65, 1.25)	0.67 (0.46, 0.99)	0.069
NOVA 2	Ref.	0.88 (0.65, 1.18)	0.81 (0.58, 1.12)	1.03 (0.77, 1.38)	0.894
NOVA 3	Ref.	1.11 (0.82, 1.50)	0.92 (0.67, 1.25)	0.87 (0.62, 1.21)	0.271
NOVA 4	Ref.	1.10 (0.82, 1.48)	0.96 (0.70, 1.31)	0.95 (0.68, 1.33)	0.599
Colorectal cancer-specific survival [a]					
NOVA 1	Ref.	0.89 (0.64, 1.23)	0.83 (0.58, 1.18)	0.66 (0.44, 1.01)	0.059
NOVA 2	Ref.	0.83 (0.60, 1.15)	0.83 (0.59, 1.17)	0.93 (0.67, 1.28)	0.683
NOVA 3	Ref.	1.03 (0.74, 1.43)	0.86 (0.62, 1.20)	0.75 (0.52, 1.08)	0.085
NOVA 4	Ref.	1.27 (0.92, 1.76)	0.98 (0.69, 1.39)	0.99 (0.69, 1.42)	0.579
Recurrence- or metastasis-free survival [a]					
NOVA 1	Ref.	0.87 (0.64, 1.18)	0.87 (0.64, 1.19)	0.82 (0.58, 1.17)	0.314
NOVA 2	Ref.	1.28 (0.96, 1.71)	1.20 (0.88, 1.63)	1.13 (0.83, 1.53)	0.594
NOVA 3	Ref.	0.91 (0.68, 1.22)	0.86 (0.64, 1.15)	0.87 (0.64, 1.20)	0.349
NOVA 4	Ref.	1.19 (0.88, 1.61)	0.97 (0.71, 1.33)	1.09 (0.79, 1.50)	0.941

Abbreviations: NOVA 1: unprocessed/minimally processed foods; NOVA 2: processed culinary ingredients; NOVA 3: processed foods; NOVA 4: ultra-processed foods. Q: quartile.

[a] Model adjusted for age at diagnosis, sex, BMI, smoking status, alcohol consumption, physical activity, total energy intake, cancer stage, cancer site, tumor differentiation, surgery, radiotherapy or chemotherapy, and family history of cancer in first-degree relatives.

[b] Test for linear trend was based on the median values for each quartile.

Table S12 Hazard ratios (95% confidence intervals) for survival outcomes according to daily intake of NOVA 1–4 food groups (g/day) in the Guangdong Colorectal Cancer Cohort Study (further adjusted for other three NOVA-defined food groups).

	Q1	Q2	Q3	Q4	*P*-Trend [b]
Overall survival [a]					
NOVA 1	Ref.	0.85 (0.68, 1.05)	0.90 (0.71, 1.13)	0.70 (0.53, 0.93)	0.035
NOVA 2	Ref.	0.93 (0.75, 1.14)	0.83 (0.66, 1.04)	0.91 (0.74, 1.12)	0.271
NOVA 3	Ref.	1.07 (0.86, 1.34)	1.01 (0.81, 1.26)	0.87 (0.69, 1.11)	0.236
NOVA 4	Ref.	0.98 (0.79, 1.22)	1.10 (0.88, 1.37)	1.05 (0.83, 1.32)	0.489
Colorectal cancer-specific survival [a]					
NOVA 1	Ref.	0.84 (0.67, 1.05)	0.83 (0.65, 1.06)	0.68 (0.50, 0.91)	0.016
NOVA 2	Ref.	0.92 (0.74, 1.15)	0.85 (0.67, 1.08)	0.87 (0.70, 1.08)	0.174
NOVA 3	Ref.	1.02 (0.81, 1.28)	0.94 (0.75, 1.19)	0.78 (0.61, 1.00)	0.045
NOVA 4	Ref.	1.08 (0.86, 1.37)	1.16 (0.92, 1.47)	1.09 (0.85, 1.40)	0.407
Recurrence- or metastasis-free survival [a]					
NOVA 1	Ref.	0.94 (0.73, 1.21)	1.01 (0.78, 1.31)	0.80 (0.59, 1.09)	0.249
NOVA 2	Ref.	1.25 (0.99, 1.58)	1.02 (0.79, 1.30)	1.02 (0.80, 1.30)	0.726
NOVA 3	Ref.	1.05 (0.82, 1.33)	0.94 (0.73, 1.20)	0.94 (0.72, 1.22)	0.469
NOVA 4	Ref.	1.12 (0.87, 1.45)	0.99 (0.77, 1.29)	1.22 (0.94, 1.58)	0.256

Abbreviations: NOVA 1: unprocessed/minimally processed foods; NOVA 2: processed culinary ingredients; NOVA 3: processed foods; NOVA 4: ultra-processed foods. Q: quartile.

[a] Model adjusted for age at diagnosis, sex, BMI, smoking status, alcohol consumption, physical activity, total energy intake, cancer stage, cancer site, tumor differentiation, surgery, radiotherapy or chemotherapy, and family history of cancer in first-degree relatives and other three NOVA-defined food groups.

[b] Test for linear trend was based on the median values for each quartile.

Table S13 Hazard ratios (95% confidence intervals) for survival outcomes according to daily intake of NOVA 1–4 food groups (g/day) in the Guangdong Colorectal Cancer Cohort Study (further adjusted for a proxy measure of NSAID use).

	Q1	Q2	Q3	Q4	*P*-Trend [b]
Overall survival [a]					
NOVA 1	Ref.	0.87 (0.70, 1.07)	0.93 (0.74, 1.17)	0.73 (0.56, 0.97)	0.065
NOVA 2	Ref.	0.94 (0.77, 1.16)	0.84 (0.67, 1.05)	0.92 (0.75, 1.12)	0.284
NOVA 3	Ref.	1.11 (0.89, 1.38)	1.06 (0.85, 1.32)	0.93 (0.73, 1.17)	0.498
NOVA 4	Ref.	0.98 (0.79, 1.22)	1.13 (0.91, 1.40)	1.08 (0.86, 1.36)	0.321
Colorectal cancer-specific survival [a]					
NOVA 1	Ref.	0.86 (0.69, 1.08)	0.88 (0.69, 1.12)	0.72 (0.54, 0.97)	0.050
NOVA 2	Ref.	0.94 (0.76, 1.17)	0.86 (0.68, 1.09)	0.88 (0.71, 1.10)	0.209
NOVA 3	Ref.	1.06 (0.85, 1.33)	0.99 (0.78, 1.25)	0.84 (0.65, 1.07)	0.142
NOVA 4	Ref.	1.06 (0.84, 1.34)	1.18 (0.94, 1.49)	1.11 (0.87, 1.42)	0.285
Recurrence- or metastasis-free survival [a]					
NOVA 1	Ref.	0.94 (0.73, 1.21)	1.03 (0.79, 1.33)	0.82 (0.61, 1.11)	0.329
NOVA 2	Ref.	1.25 (0.99, 1.58)	1.00 (0.78, 1.29)	1.03 (0.81, 1.31)	0.757
NOVA 3	Ref.	1.07 (0.84, 1.36)	0.96 (0.75, 1.23)	0.97 (0.75, 1.27)	0.667
NOVA 4	Ref.	1.13 (0.88, 1.45)	1.01 (0.78, 1.31)	1.23 (0.95, 1.59)	0.215

Abbreviations: NOVA 1: unprocessed/minimally processed foods; NOVA 2: processed culinary ingredients; NOVA 3: processed foods; NOVA 4: ultra-processed foods. Q: quartile.

[a] Model adjusted for age at diagnosis, sex, BMI, smoking status, alcohol consumption, physical activity, total energy intake, cancer stage, cancer site, tumor differentiation, surgery, radiotherapy or chemotherapy, history of cancer in first-degree relatives and a proxy measure of NSAID use.

[b] Test for linear trend was based on the median values for each quartile.

Table S14 Reclassification of food items for sensitivity analysis.

Food category	Primary analysis	Sensitivity analysis	Rationale for Reclassification
Dairy products (e.g., cheese, yogurt)	NOVA 4	NOVA3	Can be made at home with minimal ingredients (milk, bacterial cultures, salt).
Soymilk	NOVA 4	NOVA 3	Can be prepared at home using only soybeans and water.
Preserved Eggs	NOVA 4	NOVA 3	Traditional methods use only eggs, salt, and ash without synthetic additives.
Preserved Vegetables	NOVA 4	NOVA 3	Traditional preservation relies on fermentation with salt, not industrial preservatives.
Milk powder	NOVA 4	NOVA 1	Plain powder is produced solely by dehydrating milk without additives.

Abbreviations: NOVA 1: unprocessed/minimally processed foods; NOVA 2: processed culinary ingredients; NOVA 3: processed foods; NOVA 4: ultra-processed foods.

Table S15 Hazard ratios (95% confidence intervals) for survival outcomes according to daily intake of NOVA 1–4 food groups (g/day) in the Guangdong Colorectal Cancer Cohort Study (reclassification of food items).

	Q1	Q2	Q3	Q4	*P*-Trend [b]
Overall survival [a]					
NOVA 1	Ref.	0.89 (0.72, 1.10)	0.94 (0.75, 1.19)	0.73 (0.56, 0.97)	0.061
NOVA 3	Ref.	1.04 (0.84, 1.29)	0.92 (0.74, 1.15)	0.90 (0.71, 1.14)	0.262
NOVA 4	Ref.	0.89 (0.72, 1.12)	1.01 (0.82, 1.25)	0.98 (0.78, 1.23)	0.816
Colorectal cancer-specific survival [a]					
NOVA 1	Ref.	0.89 (0.71, 1.11)	0.89 (0.70, 1.14)	0.73 (0.54, 0.97)	0.047
NOVA 3	Ref.	0.95 (0.76, 1.20)	0.85 (0.68, 1.08)	0.84 (0.65, 1.08)	0.111
NOVA 4	Ref.	0.97 (0.77, 1.23)	1.05 (0.84, 1.32)	1.00 (0.79, 1.28)	0.805
Recurrence- or metastasis-free survival [a]					
NOVA 1	Ref.	0.96 (0.75, 1.24)	1.03 (0.80, 1.33)	0.83 (0.61, 1.12)	0.321
NOVA 3	Ref.	1.07 (0.84, 1.36)	0.99 (0.77, 1.28)	0.94 (0.71, 1.24)	0.563
NOVA 4	Ref.	1.00 (0.78, 1.28)	0.97 (0.76, 1.25)	1.09 (0.84, 1.40)	0.563

Abbreviations: NOVA 1: unprocessed/minimally processed foods; NOVA 2: processed culinary ingredients; NOVA 3: processed foods; NOVA 4: ultra-processed foods. Q: quartile.

[a] Model adjusted for age at diagnosis, sex, BMI, smoking status, alcohol consumption, physical activity, total energy intake, cancer stage, cancer site, tumor differentiation, surgery, radiotherapy or chemotherapy, and history of cancer in first-degree relatives.

[b] Test for linear trend was based on the median values for each quartile.

Table S16 Association of inflammation biomarkers with colorectal cancer prognosis.

	Q1	Q2	Q3	Q4	*P*-Trend [b]	Continuous (Per SD increase)	*P*
Overall survival [a]							
CRP	Ref.	1.06 (0.84, 1.35)	1.00 (0.79, 1.27)	1.59 (1.27, 1.99)	<0.001	1.14 (1.08, 1.20)	<0.001
SII	Ref.	0.88 (0.70, 1.11)	1.15 (0.93, 1.43)	1.30 (1.05, 1.61)	0.001	1.28 (1.14, 1.43)	<0.001
SIRI	Ref.	1.11 (0.87, 1.40)	1.08 (0.85, 1.38)	1.61 (1.29, 2.01)	<0.001	1.31 (1.18, 1.46)	<0.001
NLR	Ref.	1.01 (0.80, 1.28)	1.36 (1.09, 1.69)	1.41 (1.14, 1.76)	<0.001	1.43 (1.23, 1.66)	<0.001
MLR	Ref.	1.01 (0.79, 1.29)	1.27 (1.00, 1.60)	1.38 (1.10, 1.71)	<0.001	1.52 (1.29, 1.80)	<0.001
NMLR	Ref.	1.09 (0.86, 1.38)	1.34 (1.07, 1.68)	1.49 (1.19, 1.85)	<0.001	1.47 (1.25, 1.71)	<0.001
Colorectal cancer-specific survival [a]							
CRP	Ref.	1.09 (0.85, 1.40)	1.00 (0.77, 1.28)	1.56 (1.23, 1.98)	<0.001	1.13 (1.07, 1.20)	<0.001
SII	Ref.	0.87 (0.69, 1.10)	1.06 (0.84, 1.33)	1.23 (0.99, 1.54)	0.015	1.26 (1.11, 1.42)	<0.001
SIRI	Ref.	1.03 (0.80, 1.32)	1.04 (0.81, 1.33)	1.50 (1.19, 1.89)	<0.001	1.29 (1.15, 1.44)	<0.001
NLR	Ref.	1.02 (0.79, 1.30)	1.30 (1.03, 1.65)	1.39 (1.11, 1.75)	<0.001	1.41 (1.21, 1.65)	<0.001
MLR	Ref.	0.99 (0.76, 1.28)	1.27 (0.99, 1.63)	1.38 (1.09, 1.73)	<0.001	1.50 (1.26, 1.79)	<0.001
NMLR	Ref.	1.08 (0.84, 1.38)	1.29 (1.02, 1.64)	1.45 (1.15, 1.83)	<0.001	1.44 (1.23, 1.70)	<0.001
Recurrence- or metastasis-free survival [a]							
CRP	Ref.	0.97 (0.76, 1.24)	0.90 (0.70, 1.16)	1.00 (0.78, 1.28)	0.894	0.99 (0.93, 1.05)	0.777
SII	Ref.	0.86 (0.68, 1.10)	0.98 (0.77, 1.24)	0.90 (0.71, 1.15)	0.656	0.98 (0.85, 1.12)	0.751
SIRI	Ref.	1.01 (0.79, 1.29)	0.85 (0.67, 1.09)	0.95 (0.74, 1.22)	0.418	0.92 (0.81, 1.05)	0.210
NLR	Ref.	0.95 (0.75, 1.21)	1.00 (0.79, 1.27)	0.99 (0.78, 1.26)	0.943	0.96 (0.80, 1.15)	0.691
MLR	Ref.	1.03 (0.80, 1.32)	1.16 (0.91, 1.49)	0.98 (0.76, 1.25)	0.990	0.95 (0.78, 1.16)	0.609
NMLR	Ref.	0.94 (0.73, 1.19)	1.06 (0.83, 1.34)	0.99 (0.78, 1.26)	0.826	0.96 (0.80, 1.16)	0.689

Abbreviations: CRP, C-reactive protein; SII, Systemic immune-inflammation index; SIRI, Systemic inflammation response index; NLR, Neutrophil-lymphocyte ratio; MLR, Monocyte-lymphocyte ratio; NMLR, Neutrophil-monocyte-lymphocyte ratio. Q: quartile.

[a] Model adjusted for age at diagnosis, sex, BMI, smoking status, alcohol consumption, physical activity, total energy intake, cancer stage, cancer site, tumor differentiation, surgery, radiotherapy or chemotherapy, and family history of cancer in first-degree relatives.

[b] Test for linear trend was based on the median values for each quartile.

Table S17 Associations between consumption of NOVA 1–4 food groups (g/day) and inflammatory biomarkers.

	Q1	Q2	Q3	Q4	*P*-Trend [b]	Continuous (Per SD increase)	*P*
NOVA 1 [a]							
CRP	Ref.	-0.15 (-0.30, -0.01)	-0.26 (-0.41, -0.10)	-0.33 (-0.51, -0.15)	<0.001	-0.12 (-0.19, -0.05)	<0.001
SII	Ref.	-0.04 (-0.11, 0.02)	-0.07 (-0.14, -0.00)	-0.12 (-0.20, -0.04)	0.002	-0.05 (-0.08, -0.02)	<0.001
SIRI	Ref.	-0.02 (-0.10, 0.05)	-0.05 (-0.12, 0.02)	-0.11 (-0.19, -0.02)	0.012	-0.04 (-0.07, -0.01)	0.016
NLR	Ref.	-0.01(-0.06, 0.04)	-0.02(-0.07, 0.03)	-0.07(-0.13, -0.01)	0.037	-0.03 (-0.05, -0.01)	0.006
MLR	Ref.	-0.01 (-0.06, 0.04)	-0.00 (-0.05, 0.05)	-0.06 (-0.12, -0.01)	0.052	-0.02 (-0.04, -0.00)	0.048
NMLR	Ref.	-0.01(-0.06, 0.03)	-0.02(-0.07, 0.03)	-0.07(-0.12, -0.01)	0.032	-0.03 (-0.05, -0.01)	0.006
NOVA 2 [a]							
CRP	Ref.	-0.09 (-0.24, 0.06)	-0.19 (-0.34, -0.05)	-0.14 (-0.28, 0.01)	0.031	-0.02 (-0.07, 0.03)	0.499
SII	Ref.	0.01 (-0.06, 0.07)	0.07 (0.01, 0.14)	0.04 (-0.03, 0.10)	0.085	0.02 (-0.00, 0.04)	0.083
SIRI	Ref.	-0.00 (-0.07, 0.07)	-0.02 (-0.09, 0.05)	0.00 (-0.07, 0.07)	0.862	0.01 (-0.02, 0.03)	0.528
NLR	Ref.	0.01 (-0.04, 0.06)	0.04 (-0.01, 0.09)	0.02 (-0.03, 0.07)	0.238	0.01 (-0.00, 0.03)	0.160
MLR	Ref.	0.01 (-0.04, 0.06)	-0.02 (-0.06, 0.03)	0.01 (-0.04, 0.05)	0.992	0.01 (-0.01, 0.03)	0.281
NMLR	Ref.	0.01 (-0.04, 0.06)	0.03 (-0.02, 0.08)	0.02 (-0.03, 0.07)	0.284	0.01 (-0.00, 0.03)	0.162
NOVA 3 [a]							
CRP	Ref.	-0.01 (-0.15, 0.14)	0.06 (-0.09, 0.21)	0.01 (-0.15, 0.17)	0.680	0.05 (-0.01, 0.11)	0.075
SII	Ref.	0.04 (-0.03, 0.10)	0.02 (-0.05, 0.08)	0.01 (-0.07, 0.08)	0.952	0.01 (-0.01, 0.04)	0.335
SIRI	Ref.	0.03 (-0.04, 0.10)	0.01 (-0.06, 0.08)	-0.01 (-0.09, 0.07)	0.730	0.00 (-0.03, 0.03)	0.877
NLR	Ref.	0.03 (-0.02, 0.07)	0.00 (-0.05, 0.05)	0.01 (-0.05, 0.06)	0.965	0.00 (-0.02, 0.02)	0.710
MLR	Ref.	0.01 (-0.03, 0.06)	0.02 (-0.03, 0.06)	0.02 (-0.03, 0.07)	0.364	0.01 (-0.01, 0.03)	0.239
NMLR	Ref.	0.02 (-0.02, 0.07)	0.00 (-0.04, 0.05)	0.01 (-0.05, 0.06)	0.986	0.00 (-0.01, 0.02)	0.650
NOVA 4 [a]							
CRP	Ref.	0.03 (-0.11, 0.17)	-0.06 (-0.21, 0.08)	0.05 (-0.11, 0.20)	0.860	0.01 (-0.04, 0.07)	0.651

SII	Ref.	-0.02 (-0.09, 0.04)	-0.01 (-0.07, 0.06)	-0.00 (-0.07, 0.06)	0.994	-0.00 (-0.03, 0.02)	0.914
SIRI	Ref.	0.02 (-0.05, 0.09)	-0.01 (-0.08, 0.06)	0.01 (-0.07, 0.08)	0.986	-0.01 (-0.03, 0.02)	0.551
NLR	Ref.	-0.02 (-0.07, 0.03)	-0.03 (-0.08, 0.02)	-0.04 (-0.09, 0.02)	0.168	-0.01 (-0.03, 0.00)	0.116
MLR	Ref.	0.02 (-0.02, 0.07)	0.01 (-0.04, 0.05)	0.03 (-0.02, 0.08)	0.400	-0.00 (-0.02, 0.02)	0.937
NMLR	Ref.	-0.02 (-0.07, 0.03)	-0.03 (-0.07, 0.02)	-0.03 (-0.08, 0.02)	0.234	-0.01 (-0.03, 0.00)	0.148

Abbreviations: CRP, C-reactive protein; NLR, Neutrophil-lymphocyte ratio; MLR, Monocyte-lymphocyte ratio; NMLR, Neutrophil-monocyte-lymphocyte ratio; SIRI, Systemic inflammation response index; SII, Systemic immune-inflammation index. NOVA 1: unprocessed/minimally processed foods; NOVA 2: processed culinary ingredients; NOVA 3: processed foods; NOVA 4: ultra-processed foods. Q: quartile.

[a] Model adjusted for age at diagnosis, sex, BMI, smoking status, alcohol consumption, physical activity, total energy intake, cancer stage, cancer site, tumor differentiation, surgery, radiotherapy or chemotherapy, and family history of cancer in first-degree relatives.

[b] Test for linear trend was based on the median values for each quartile.

Table S18 Mediating effects of inflammatory biomarkers on the associations between daily intake of NOVA 1–4 food groups (g/day) and colorectal cancer prognosis.

	Mediator	Proportion mediated [%. (95%·CI)] [a]	*P*
Overall survival			
NOVA 1	CRP	9.40 (2.29, 58.6)	0.008
	SII	7.89 (0.90, 44.16)	0.036
	SIRI	6.73 (0.37, 44.87)	0.044
	NLR	6.90 (0.45, 33.95)	0.036
	MLR	6.11 (-0.62, 31.7)	0.082
	NMLR	7.27 (0.81, 36.11)	0.042
NOVA 2	CRP	-4.06 (-59.56, 71.99)	0.604
	SII	9.98 (-76.79, 89.44)	0.384
	SIRI	4.05 (-67.3, 58.07)	0.854
	NLR	8.57 (-88.15, 84.43)	0.482
	MLR	8.73 (-47.58, 83.42)	0.522
	NMLR	9.48 (-64.79, 124.48)	0.414
NOVA 3	CRP	-7.98 (-60.12, 46.38)	0.288
	SII	-3.73 (-60.87, 35.68)	0.542
	SIRI	-0.73 (-29.44, 27.63)	0.998
	NLR	-1.5 (-64.36, 33.75)	0.762
	MLR	-6.44 (-65.66, 88.61)	0.488
	NMLR	-1.94 (-52.77, 33.95)	0.758
NVOA 4	CRP	-1.59 (-24.9, 23.21)	0.786
	SII	0.25 (-24.2, 22.14)	0.882
	SIRI	2.10 (-24.01, 31.82)	0.564
	NLR	5.70 (-35.73, 49.51)	0.228
	MLR	0.14 (-29.61, 24.5)	0.984
	NMLR	5.44 (-31.79, 57.7)	0.264
Colorectal cancer-specific survival			
NOVA 1	CRP	8.12 (1.33, 40.64)	0.026
	SII	8.27 (0.28, 54.24)	0.044
	SIRI	5.58 (0.41, 23.28)	0.028
	NLR	6.01 (0.79, 27.82)	0.028
	MLR	5.29 (-0.26, 27.38)	0.066
	NMLR	6.31 (0.92, 28.00)	0.020
NOVA 2	CRP	3.69 (-41.68, 49.31)	0.692
	SII	9.2 (-50.43, 113.9)	0.388
	SIRI	3.81 (-43.32, 59.83)	0.732
	NLR	8.51 (-121.12, 90.45)	0.470
	MLR	8.52 (-93.58, 137.28)	0.510
	NMLR	8.83 (-94.46, 93.73)	0.476
NOVA 3	CRP	-4.64 (-25.4, 6.55)	0.134
	SII	-2.14 (-16.3, 6.51)	0.424
	SIRI	-0.40 (-12.68, 9.36)	0.840

	NLR	-0.88 (-16.2, 11.41)	0.758
	MLR	-3.57 (-27.31, 6.89)	0.284
	NMLR	-1.13 (-14.95, 9.89)	0.750
NVOA 4	CRP	-1.85 (-35.14, 31.31)	0.752
	SII	0.29 (-38.15, 25.39)	0.878
	SIRI	2.33 (-26.97, 33.38)	0.694
	NLR	6.62 (-54.46, 72.7)	0.298
	MLR	0.17 (-37.43, 38.28)	0.960
	NMLR	6.30 (-87.10, 88.18)	0.314
Recurrence- or metastasis-free survival			
NOVA 1	CRP	-8.84 (-117.29, 79.06)	0.856
	SII	-2.92 (-90.33, 74.74)	0.920
	SIRI	-12.49 (-87.36, 112.04)	0.732
	NLR	-3.94 (-55.47, 75.31)	0.894
	MLR	-4.52 (-54.86, 55.98)	0.878
	NMLR	-4.07 (-54.29, 64.19)	0.912
NOVA 2	CRP	6.40 (-34.65, 44.83)	0.875
	SII	-3.19 (-51.75, 55.38)	0.990
	SIRI	-8.44 (-69.51, 73.30)	1.000
	NLR	-5.03 (-40.93, 38.68)	0.992
	MLR	-6.61 (-42.16, 33.21)	0.954
	NMLR	-5.16 (-33.78, 43.56)	0.950
NOVA 3	CRP	0.00 (1.59, -15.41)	0.648
	SII	0.16 (-9.80, 13.51)	0.962
	SIRI	0.32 (-17.21, 13.36)	0.878
	NLR	0.15 (-9.96, 9.43)	0.924
	MLR	0.88 (-10.22, 16.49)	0.724
	NMLR	0.20 (-8.98, 7.93)	0.976
NVOA 4	CRP	-0.45 (-13.75, 8.77)	0.882
	SII	0.01 (-12.87, 8.25)	0.886
	SIRI	0.95 (-20.50, 18.87)	0.862
	NLR	0.67 (-14.82, 21.8)	0.880
	MLR	-0.07 (-7.70, 10.12)	0.966
	NMLR	0.64 (-14.27, 17.64)	0.838

Abbreviations: CRP, C-reactive protein; NLR, Neutrophil-lymphocyte ratio; MLR, Monocyte-lymphocyte ratio; NMLR, Neutrophil-monocyte-lymphocyte ratio; SIRI, Systemic inflammation response index; SII, Systemic immune-inflammation index. NOVA 1: unprocessed/minimally processed foods; NOVA 2: processed culinary ingredients; NOVA 3: processed foods; NOVA 4: ultra-processed foods.

[a] Model adjusted for age at diagnosis, sex, BMI, smoking status, alcohol consumption, physical activity, total energy intake, cancer stage, cancer site, tumor differentiation, surgery, radiotherapy or chemotherapy, and family history of cancer in first-degree relatives.

Table S19 Mediating effects of inflammatory biomarkers on the associations between daily intake of NOVA 1–4 food groups (g/day) and colorectal cancer prognosis (further adjusted for a proxy measure of NSAID use).

	Mediator	Proportion mediated [%. (95%·CI)] a	P
Overall survival			
NOVA 1	CRP	9.93 (1.19, 60.62)	0.044
	SII	8.38 (14.08, 48.55)	0.024
	SIRI	6.85 (0.06, 32.53)	0.056
	NLR	7.17 (0.31, 34.60)	0.044
	MLR	6.10 (0.30, 32.53)	0.062
	NMLR	7.52 (1.04, 40.89)	0.024
NOVA 2	CRP	3.67 (-50.90, 38.68)	0.696
	SII	9.82 (-46.97, 71.57)	0.352
	SIRI	4.50 (-83.49, 80.95)	0.816
	NLR	9.26 (-101.89, 100.47)	0.462
	MLR	8.93 (-72.22, 76.57)	0.514
	NMLR	9.59 (-67.91, 96.83)	0.454
NOVA 3	CRP	-8.13 (-77.64, 60.59)	0.288
	SII	-3.82 (-73.12, 44.07)	0.584
	SIRI	-0.01 (-48.11, 38.50)	0.960
	NLR	-1.58 (-30.57, 49.73)	0.834
	MLR	6.56 (-108.88, 63.45)	0.448
	NMLR	-2.02 (42.84, 34.02)	0.782
NVOA 4	CRP	-2.09 (-46.68, 32.20)	0.650
	SII	0.28 (-22.27, 33.77)	0.920
	SIRI	1.89 (-24.91, 31.11)	0.686
	NLR	5.79 (-38.01, 45.66)	0.264
	MLR	0.06 (-22.97, 24.09)	0.998
	NMLR	5.50 (-45.39, 67.77)	0.27
Colorectal cancer-specific survival			
NOVA 1	CRP	8.56 (1.65, 43.45)	0.020
	SII	7.13 (0.79, 34.12)	0.028
	SIRI	5.80 (0.17, 26.66)	0.048
	NLR	6.29 (0.40, 23.93)	0.032
	MLR	5.45 (-0.56, 25.59)	0.074
	NMLR	6.59 (0.65, 27.42)	0.032
NOVA 2	CRP	-3.34 (-62.16, 58.57)	0.670
	SII	9.06 (-72.07, 108.59)	0.420
	SIRI	4.04 (-63.38, 53.74)	0.782
	NLR	8.66 (-76.40, 88.05)	0.470
	MLR	8.44 (-62.73, 61.26)	0.530
	NMLR	8.96 (-58.40, 73.96)	0.446
NOVA 3	CRP	-4.74 (-28.67, 3.64)	0.088
	SII	-2.19 (-16.52, 6.42)	0.422

	SIRI	-0.45 (-12.09, 12.46)	0.852
	NLR	-0.92 (-16.46, 0.09)	0.744
	MLR	-3.63 (-31.41, 5.37)	0.284
	NMLR	-1.18 (-16.60, 10.09)	0.718
NVOA 4	CRP	-2.43 (-38.31, 40.00)	0.706
	SII	0.32 (-28.96, 35.84)	0.828
	SIRI	2.12 (-40.02, 49.49)	0.722
	NLR	6.77 (-52.60, 74.06)	0.366
	MLR	0.07 (-26.32, 38.73)	0.996
	NMLR	6.43 (-55.41, 66.06)	0.398
Recurrence- or metastasis-free survival			
NOVA 1	CRP	-8.58 (-74.29, 66.54)	0.736
	SII	-2.95 (-82.73, 63.89)	0.902
	SIRI	-11.93 (-80.87, 87.51)	0.702
	NLR	-3.75 (-95.66, 47.48)	0.876
	MLR	-4.17 (-46.26, 47.63)	0.878
	NMLR	-3.85 (-46.61, 52.09)	0.882
NOVA 2	CRP	6.27 (-32.24, 45.49)	0.944
	SII	-3.43 (-45.58, 38.13)	0.968
	SIRI	-9.33 (-43.60, 59.54)	0.946
	NLR	-5.25 (-53.22, 35.90)	0.996
	MLR	-6.55 (-37.70, 38.69)	0.944
	NMLR	-5.35 (-50.62, 40.44)	0.964
NOVA 3	CRP	1.60 (-10.93, 22.53)	0.642
	SII	0.17 (-9.07, 8.08)	0.940
	SIRI	0.35 (-19.23, 20.44)	0.884
	NLR	0.15 (-8.80, 9.42)	0.934
	MLR	0.83 (-10.70, 15.40)	0.690
	NMLR	0.19 (-8.10, 12.04)	0.928
NVOA 4	CRP	-0.58 (-16.68, 12.92)	0.844
	SII	0.01 (-10.63, 14.62)	0.982
	SIRI	0.79 (-11.33, 20.62)	0.786
	NLR	0.65 (-16.63, 13.22)	0.866
	MLR	-0.08 (-14.12, 10.27)	0.938
	NMLR	0.61 (-13.92, 16.42)	0.818

Abbreviations: CRP, C-reactive protein; NLR, Neutrophil-lymphocyte ratio; MLR, Monocyte-lymphocyte ratio; NMLR, Neutrophil-monocyte-lymphocyte ratio; SIRI, Systemic inflammation response index; SII, Systemic immune-inflammation index. NOVA 1: unprocessed/minimally processed foods; NOVA 2: processed culinary ingredients; NOVA 3: processed foods; NOVA 4: ultra-processed foods.

[a] Model adjusted for age at diagnosis, sex, BMI, smoking status, alcohol consumption, physical activity, total energy intake, cancer stage, cancer site, tumor differentiation, surgery, radiotherapy or chemotherapy, family history of cancer in first-degree relatives and a proxy measure of NSAID use.

Table S20 Mediating effects of inflammatory biomarkers on the associations between daily intake of NOVA 1–4 food groups (g/day) and colorectal cancer prognosis (further adjusted for a Dietary Guideline Adherence Score based on the Chinese Dietary Guidelines [a]).

	Mediator	Proportion mediated [%. (95%·CI)] [a]	*P*
Overall survival			
NOVA 1	CRP	10.03 (1.06, 63.13)	0.038
	SII	8.12 (1.03, 45.22)	0.034
	SIRI	7.87 (0.97, 52.09)	0.034
	NLR	8.60 (1.41, 40.35)	0.028
	MLR	7.50 (0.68, 42.44)	0.030
	NMLR	9.10 (1.27, 45.12)	0.028
NOVA 2	CRP	-3.31 (-62.24, 26.48)	0.552
	SII	7.93 (-64.83, 145.2)	0.306
	SIRI	3.13 (-51.96, 54.96)	0.610
	NLR	6.64 (-154.0, 89.36)	0.382
	MLR	6.68 (-103.5, 105.5)	0.438
	NMLR	6.89 (-78.21, 92.61)	0.400
NOVA 3	CRP	-6.80 (-67.25, 36.28)	0.158
	SII	-2.90 (-32.88, 16.91)	0.422
	SIRI	-0.47 (-30.26, 23.66)	0.912
	NLR	-1.57 (-22.15, 13.17)	0.660
	MLR	-5.67 (-93.20, 38.26)	0.352
	NMLR	-1.53 (-32.37, 17.45)	0.690
NVOA 4	CRP	-1.80 (-25.88, 18.95)	0.618
	SII	-0.35 (-30.85, 19.95)	0.918
	SIRI	2.03 (-27.16, 26.26)	0.594
	NLR	6.12 (-21.99, 81.01)	0.196
	MLR	0.42 (-30.11, 24.31)	0.926
	NMLR	5.42 (-71.71, 42.21)	0.284
Colorectal cancer-specific survival			
NOVA 1	CRP	8.51 (1.52, 53.41)	0.022
	SII	6.80 (1.19, 37.23)	0.032
	SIRI	6.56 (0.53, 35.99)	0.040
	NLR	7.40 (1.18, 35.98)	0.036
	MLR	6.58 (0.46, 33.31)	0.034
	NMLR	7.80 (1.21, 34.87)	0.016
NOVA 2	CRP	-2.50 (-41.66, 65.68)	0.608
	SII	6.20 (-64.24, 85.46)	0.342
	SIRI	2.09 (-68.97, 57.00)	0.680
	NLR	6.52 (-53.45, 71.46)	0.402
	MLR	5.69 (-56.45, 67.19)	0.484
	NMLR	5.73 (-121.2, 77.01)	0.442
NOVA 3	CRP	-4.35 (-24.15, 0.38)	0.068

	SII	-1.89 (-12.37, 3.48)	0.386
	SIRI	-0.42 (-8.99, 6.57)	0.854
	NLR	-0.92 (-11.83, 4.69)	0.690
	MLR	-3.49 (-22.25, 3.29)	0.246
	NMLR	-1.03 (-11.40, 4.99)	0.650
NVOA 4	CRP	-2.07 (-39.58, 32.97)	0.636
	SII	-0.16 (-34.46, 22.14)	0.958
	SIRI	1.75 (-45.43, 34.10)	0.710
	NLR	5.44 (-60.70, 56.07)	0.340
	MLR	0.58 (-33.27, 36.98)	0.900
	NMLR	5.84 (-72.19, 75.31)	0.332
Recurrence- or metastasis-free survival			
NOVA 1	CRP	-0.03 (-154.70, 73.13)	0.998
	SII	-0.06 (-88.15, 63.18)	0.99
	SIRI	1.71 (-81.10, 136.13)	0.872
	NLR	0.02 (-87.45, 79.42)	0.996
	MLR	-0.04 (-85.16, 67.73)	0.994
	NMLR	0.56 (-77.81, 64.64)	0.936
NOVA 2	CRP	-0.00 (-30.69, 32.17)	0.996
	SII	0.02 (-42.65, 34.19)	0.984
	SIRI	0.02 (-58.35, 45.73)	0.972
	NLR	-0.14 (-59.89, 47.04)	0.936
	MLR	-0.05 (-40.43, 29.16)	0.964
	NMLR	-0.03 (-44.33, 35.38)	0.978
NOVA 3	CRP	1.04 (-14.44, 24.20)	0.62
	SII	0.03 (-9.752, 8.67)	0.942
	SIRI	0.05 (-16.96, 13.31)	0.93
	NLR	0.01 (-7.03, 6.58)	0.956
	MLR	0.29 (-12.10, 14.70)	0.756
	NMLR	0.03 (-8.54, 10.00)	0.936
NVOA 4	CRP	-0.19 (-9.94, 8.39)	0.804
	SII	-0.01 (-6.90, 5.20)	0.96
	SIRI	0.35 (-7.73, 15.69)	0.736
	NLR	0.20 (-13.36, 14.08)	0.836
	MLR	-0.02 (-6.87, 6.15)	0.968
	NMLR	0.21 (-10.26, 11.28)	0.816

Abbreviations: CRP, C-reactive protein; NLR, Neutrophil-lymphocyte ratio; MLR, Monocyte-lymphocyte ratio; NMLR, Neutrophil-monocyte-lymphocyte ratio; SIRI, Systemic inflammation response index; SII, Systemic immune-inflammation index. NOVA 1: unprocessed/minimally processed foods; NOVA 2: processed culinary ingredients; NOVA 3: processed foods; NOVA 4: ultra-processed foods.

[a] Model adjusted for age at diagnosis, sex, BMI, smoking status, alcohol consumption, physical activity, total energy intake, cancer stage, cancer site, tumor differentiation, surgery, radiotherapy or chemotherapy, family history of cancer in first-degree relatives, and a Dietary Guideline Adherence Score based on the Chinese Dietary Guidelines.