

Table S1. Daily food and nutrient intake according to total kimchi consumption

	Total kimchi consumption					<i>p</i> -value
	<1 serving/day	1-2 servings/day	2-3 servings/day	3-5 servings/day	≥5 servings/day	
Men (n = 36,756)	5,081 (13.8)	7,303 (19.9)	5,816 (15.8)	12,675 (34.5)	5,881 (16.0)	
Median (range), serving/day	0.53 (0.00 – 0.99)	1.43 (1.00 – 1.98)	2.25 (2.00 – 2.99)	3.5 (3.00 – 4.99)	6.13 (5.00 – 18.00)	
Food intake (g/day)						
Baechu kimchi	17.0 ± 11.6	49.8 ± 17.0	80.9 ± 24.0	143.5 ± 41.0	177.3 ± 45.0	<.0001
Kkakdugi	5.0 ± 5.4	13.2 ± 11.9	22.5 ± 18.7	26.7 ± 28.6	110.3 ± 61.9	<.0001
Nabac kimchi/Dongchimi	3.0 ± 5.4	5.9 ± 9.8	9.9 ± 16.9	12.0 ± 23.9	55.8 ± 89.2	<.0001
Other kimchi	2.0 ± 3.2	3.9 ± 6.3	6.4 ± 9.7	7.4 ± 13.3	30.7 ± 47.6	<.0001
Jang-ajji	1.4 ± 3.4	2.1 ± 4.7	2.8 ± 5.4	3.0 ± 6.9	6.7 ± 13.7	<.0001
Pickled radish	3.8 ± 8.1	5.9 ± 9.5	8.1 ± 13.8	8.2 ± 15.1	17.3 ± 32.1	<.0001
Cooked rice ¹	619.2 ± 166.9	621.6 ± 169.6	603.2 ± 165.6	657.6 ± 155.2	672.9 ± 170.2	<.0001
Daily nutrient intake						
Total energy, kcal	1649.2 ± 428.4	1770.5 ± 445.5	1806.9 ± 464.8	1901.0 ± 453.7	2102.7 ± 506.6	<.0001
Carbohydrates, g	298.7 ± 74.5	313.4 ± 77.0	314.4 ± 79.0	334.3 ± 76.2	363.8 ± 84.7	<.0001
Protein, g	50.4 ± 18.1	57.5 ± 18.7	61.3 ± 20.8	64.7 ± 20.8	77.0 ± 25.2	<.0001
Fat, g	24.6 ± 14.0	28.9 ± 14.5	31.4 ± 15.6	31.6 ± 15.4	36.6 ± 17.6	<.0001
Sodium ² , mg	1155.3 ± 446.5	1733.3 ± 453.3	2274.6 ± 518.2	2907.0 ± 652.0	4200.4 ± 1299.3	<.0001
Potassium ² , mg	1532.3 ± 537.4	1827.5 ± 493.6	2046.4 ± 502.7	2199.1 ± 502.6	2718.0 ± 645.6	<.0001
Fiber ² , g	3.4 ± 1.2	4.2 ± 1.2	5.0 ± 1.3	5.8 ± 1.4	7.7 ± 2.2	<.0001
Women (n = 78,970)	14,376 (18.2)	18,421 (23.3)	12,314 (15.6)	24,671 (31.2)	9,188 (11.6)	
Median (range), serving/day	0.50 (0.00 – 0.99)	1.35 (1.00 – 1.99)	2.18 (2.00 – 2.98)	3.37 (3.00 – 4.99)	6.12 (5.00 – 18.00)	
Food intake (g/day)						
Baechu kimchi	17.4 ± 11.7	52.0 ± 17.1	81.9 ± 23.9	143.6 ± 42.1	174.3 ± 45.3	<.0001
Kkakdugi	3.9 ± 5.1	10.3 ± 11.7	20.0 ± 19.7	23.6 ± 29.1	109 ± 61.5	<.0001
Nabac kimchi/Dongchimi	2.7 ± 5.7	5.5 ± 11.6	9.5 ± 18.3	12.2 ± 26.7	60.0 ± 90.9	<.0001
Other kimchi	1.6 ± 3.2	3.3 ± 6.3	5.6 ± 10.4	6.6 ± 13.8	31.1 ± 49.5	<.0001
Jang-ajji	1.2 ± 3.4	1.8 ± 4.4	2.4 ± 5.2	2.7 ± 6.6	6.0 ± 13.3	<.0001
Pickled radish	3.8 ± 7.5	5.8 ± 10.2	7.3 ± 12.5	8.1 ± 15.4	15.9 ± 30.9	<.0001
Cooked rice	523.3 ± 189.8	536 ± 185.6	521.5 ± 174.2	583.3 ± 168.7	594.8 ± 175.0	<.0001

Daily nutrient intake

Total energy, kcal	1503.0 ± 473.8	1627.9 ± 470	1673.0 ± 487.0	1777.9 ± 469.4	1972.8 ± 523.8	<.0001
Carbohydrates, g	272.8 ± 84.8	291.1 ± 83.4	294.3 ± 83.8	317 ± 81.1	346.6 ± 88.9	<.0001
Protein, g	47.1 ± 19.4	53.7 ± 19.3	57.7 ± 21.0	61.2 ± 21	73.4 ± 26.0	<.0001
Fat, g	22.4 ± 14.2	25.7 ± 14.0	28.0 ± 15.0	28.0 ± 14.8	32.4 ± 16.9	<.0001
Sodium, mg	1252.1 ± 518.4	1883.0 ± 555.0	2458.3 ± 653.3	3112.5 ± 854.4	4535.7 ± 1530.0	<.0001
Potassium, mg	1846.5 ± 693.4	2146.5 ± 661.6	2368.9 ± 659.2	2489.2 ± 664.2	3081.6 ± 800.8	<.0001
Fiber, g	4.2 ± 1.6	5.1 ± 1.6	5.9 ± 1.7	6.7 ± 1.8	8.9 ± 2.6	<.0001

N = 36,756. Values are mean ± SD or median (min-max).; *p*-values were calculated using χ^2 tests for categorical variables and general linear regression for continuous variables.

¹Cooked rice included cooked white rice, cooked white rice with soybean, cooked white rice with other cereals, half & half cooked white rice and rice with soybean, and half & half cooked white rice and rice with other cereals.

²Sodium, potassium, and fiber intake were adjusted using the residual method.

Table S2. ORs (95% CI) for the association between obesity and nabak kimchi and dongchimi consumption

	Nabak kimchi/Dongchimi consumption			<i>p</i> for trend
	non	<median	≥median	
Men (n = 36,756)				
Median (range), serving/week	0.00 (0.00–0.00)	0.23 (0.12–0.35)	1.50 (0.58–31.50)	
Obese¹				
Cases/participants (n)	4,881 / 13,650	3,466 / 9,622	4,926 / 13,484	
Multivariate-adjusted model ^{2a}	Ref. (1.000)	0.991 (0.938–1.047)	0.985 (0.934–1.038)	0.6028
Abdominal obesity³				
Cases/participants (n)	3,449 / 13,650	2,369 / 9,622	3,546 / 13,484	
Multivariate-adjusted model ^b	Ref. (1.000)	0.964 (0.907–1.024)	0.990 (0.935–1.049)	0.9751
Women (n = 78,970)				
Median (range), serving/week	0.00 (0.00–0.00)	0.23 (0.12–0.35)	1.50 (0.58–31.50)	
Obese				
Cases/participants (n)	8,417 / 35,366	4,603 / 19,854	6,463 / 23,750	
Multivariate-adjusted model ^c	Ref. (1.000)	0.950 (0.911–0.990)	1.024 (0.983–1.066)	0.0698
Abdominal obesity				
Cases/participants (n)	5,995 / 35,366	3,283 / 19,854	4,741 / 23,750	
Multivariate-adjusted model ^d	Ref. (1.000)	0.944 (0.900–0.990)	1.007 (0.962–1.054)	0.3578

ORs: odds ratios (95% CI); BMI: body mass index; Ref.: Reference.

¹Obesity defined as normal (18.5 kg/m²<BMI <25 kg/m²), and obese (≥25 kg/m²), and reference group of obesity is 18.5 kg/m²<BMI <25 kg/m²

²Multivariate-adjusted model: Adjusted for age (continuous), income level (<1 million won, 1–1.99 million won, 2–2.99 million won, and ≥3 million won), education level (below middle school, high school, or above college), marital status (married or others), alcohol consumption (non-drinker or current drinker), smoking status (never, past, or current smoker), physical activity (active or inactive), menopausal status (pre- or post-, only women), energy intake (continuous), energy-adjusted sodium intake (continuous), energy-adjusted potassium intake (continuous), energy-adjusted fiber intake (continuous), cooked rice, pickled radish, and jang-ajji consumption (continuous), and other kimchi consumption (except for total kimchi analysis)

One serving of nabak kimchi and dongchimi is 95 g; Median of nabak kimchi and dongchimi consumption is 0.58 servings/week.

³Abdominal obesity: WC ≥90 cm in men or ≥85 cm in women.

^aR-sqaure: 0.0088; ^bR-sqaure: 0.0064; ^cR-sqaure: 0.0267; ^dR-sqaure: 0.0401.

Table S3. ORs (95% CI) for the association between obesity and other kimchi consumption

	Other kimchi consumption			<i>p</i> for trend
	non	<median	≥median	
Men (n = 36,756)				
Median (range), serving/week	0.00 (0.00–0.00)	0.23 (0.12–0.35)	1.50 (0.58–31.50)	
Obese¹				
Cases/participants (n)	3,748 / 10,341	3,601 / 10,049	5,924 / 16,366	
Multivariate-adjusted model ^{2a}	Ref. (1.000)	0.966 (0.912–1.024)	0.947 (0.897–1.000)	0.0862
Abdominal obesity³				
Cases/participants (n)	2,678 / 10,341	2,501 / 10,049	4,185 / 16,366	
Multivariate-adjusted model ^b	Ref. (1.000)	0.955 (0.897–1.018)	0.939 (0.884–0.996)	0.0808
Women (n = 78,970)				
Median (range), serving/week	0.00 (0.00–0.00)	0.23 (0.12–0.35)	1.50 (0.58–31.50)	
Obese				
Cases/participants (n)	7,505 / 30,523	5,037 / 21,360	6,941 / 27,087	
Multivariate-adjusted model ^c	Ref. (1.000)	0.962 (0.922–1.003)	0.968 (0.930–1.008)	0.2669
Abdominal obesity				
Cases/participants (n)	5,376 / 30,523	3,558 / 21,360	5,085 / 27,087	
Multivariate-adjusted model ^d	Ref. (1.000)	0.972 (0.926–1.019)	1.012 (0.966–1.059)	0.3565

ORs: odds ratios (95% CI); BMI: body mass index; Ref.: Reference.

¹Obesity defined as normal (18.5 kg/m²<BMI <25 kg/m²), and obese (≥25 kg/m²), and reference group of obesity is 18.5 kg/m²<BMI <25 kg/m²

²Multivariate-adjusted model: Adjusted for age (continuous), income level (<1 million won, 1–1.99 million won, 2–2.99 million won, and ≥3 million won), education level (below middle school, high school, or above college), marital status (married or others), alcohol consumption (non-drinker or current drinker), smoking status (never, past, or current smoker), physical activity (active or inactive), menopausal status (pre- or post-, only women), energy intake (continuous), energy-adjusted sodium intake (continuous), energy-adjusted potassium intake (continuous), energy-adjusted fiber intake (continuous), cooked rice, pickled radish, and jang-ajji consumption (continuous), and other kimchi consumption (except for total kimchi analysis)

One serving of other kimchi is 50 g; Median of other kimchi consumption is 0.58 servings/week.

³Abdominal obesity: WC ≥90 cm in men or ≥85 cm in women.

^aR-sqaure: 0.0089; ^bR-sqaure: 0.0065; ^cR-sqaure: 0.0266; ^dR-sqaure: 0.0401.

Table S4. ORs (95% CI) for the association between obesity and baechu kimchi+kkakdugi consumption

	Baechu kimchi+Kkakdugi consumption					<i>p</i> for trend
	<1 serving/day	1-2 servings/day	2-3 serving/day	3-4 servings/day	≥4 servings/day	
Men (n = 36,756)						
Median (range), serving/day	0.50 (0.00–0.96)	1.29 (1.00–1.96)	2.08 (2.00–2.79)	3.11 (3.00–3.79)	5.00 (4.00–9.00)	
Obese¹						
Cases/participants (n)	2,031 / 5,581	2,752 / 7,900	2,012 / 5,715	3,125 / 8,877	3,353 / 8,683	
Multivariate-adjusted model ^{2a}	Ref. (1.000)	0.915 (0.848-0.987)	0.913 (0.837-0.996)	0.936 (0.854-1.026)	1.049 (0.933-1.179)	0.0389
Abdominal obesity³						
Cases/participants (n)	1,372 / 5,581	1,939 / 7,900	1,433 / 5,715	2,242 / 8,877	2,378 / 8,683	
Multivariate-adjusted model ^b	Ref. (1.000)	0.953 (0.877–1.036)	0.958 (0.871–1.054)	0.937 (0.848–1.035)	0.985 (0.868–1.118)	0.8490
Women (n = 78,970)						
Median (range), serving/day	0.50 (0.00–0.96)	1.25 (1.00–1.96)	2.04 (2.00–2.79)	3.08 (3.00–3.79)	5.00 (4.00–9.00)	
Obese						
Cases/participants (n)	3,532 / 15,665	4,521 / 19,459	2,782 / 11,986	4,666 / 17,867	3,982 / 13,993	
Multivariate-adjusted model ^c	Ref. (1.000)	0.970 (0.919-1.024)	0.951 (0.891-1.014)	0.967 (0.904-1.034)	0.993 (0.909-1.085)	0.7903
Abdominal obesity						
Cases/participants (n)	2,523 / 15,665	3,226 / 19,459	1,940 / 11,986	3,426 / 17,867	2,904 / 13,993	
Multivariate-adjusted model ^d	Ref. (1.000)	0.969 (0.911–1.030)	0.933 (0.867–1.004)	0.962 (0.892–1.037)	0.978 (0.885–1.079)	0.9593

ORs: odds ratios (95% CI); BMI: body mass index; Ref.: Reference.

¹Obesity defined as normal (18.5 kg/m²<BMI <25 kg/m²), and obese (≥25 kg/m²), and reference group of obesity is 18.5 kg/m²<BMI <25 kg/m²

²Multivariate-adjusted model: Adjusted for age (continuous), income level (<1 million won, 1–1.99 million won, 2–2.99 million won, and ≥3 million won), education level (below middle school, high school, or above college), marital status (married or others), alcohol consumption (non-drinker or current drinker), smoking status (never, past, or current smoker), physical activity (active or inactive), menopausal status (pre- or post-, only women), energy intake (continuous), energy-adjusted sodium intake (continuous), energy-adjusted potassium intake (continuous), energy-adjusted fiber intake (continuous), cooked rice, pickled radish, and jang-ajji consumption (continuous), and other kimchi consumption (except for total kimchi analysis).

³Abdominal obesity: WC ≥90 cm in men or ≥85 cm in women.

One serving of baechu kimchi+kkakdugi is 50 g. ^aR-sqaure: 0.0094; ^bR-sqaure: 0.0065; ^cR-sqaure: 0.0266; ^dR-sqaure: 0.0401.