



Question: What is the relationship between eating out and take-away meals and body weight in children and adults?

Table 2. Summary table for studies examining the relationship between meals eaten away from home and weight outcomes in adults

Author, Year Study Design, Duration Data Source, Location Risk of Bias*	Sample Size Age % Female Race/Ethnicity Mean BMI	Measure of Eating Out/Take Away Meals Weight Measures	Results
<p>Bes-Rastrollo, 2010</p> <p>Prospective Cohort (PC), 4.4y</p> <p>Seguimiento Universidad de Navarra (University of Navarra Follow-up; SUN) Cohort, Spain</p> <p>4/24</p>	<p>Final N: 9,182</p> <p>37y (SD=11.4)</p> <p>58.7% female</p> <p>Not reported (NR)</p> <p>Mean BMI: 23.3kg/m²</p>	<p>Self-reported frequency of meals away from home. Assessment: item in questionnaire: "With which frequency do you have meals away from home"</p> <p>Self-reported height and weight (highly correlated (r=0.99), with a mean relative error in self-reported weight of 1.45%)</p>	<p>Gaining > 2kg/year Odds ratios (ref: never or rarely eats out):</p> <p><i>Eat out >2 times/week:</i> OR=1.39 (95% CI=1.13-1.63); P for trend=0.001</p> <p><i>Eat out 1 time/week:</i> NS</p> <p>Incident overweight/obesity Hazard ratios (ref: never or rarely eats out):</p> <p><i>Eat out >2 times/week:</i> HR=1.33 (95% CI=1.13-1.57); P for trend <0.001</p> <p>Body Mass Index (BMI)</p> <p><i>Eating out >2 times/week had higher adjusted gain in BMI:</i> Mean 0.07 (95% CI=0.04-0.10), P-trend <0.001</p>
<p>Boggs, 2013</p> <p>PC, 14y</p> <p>Black Women's Cohort Study, 1995, USA</p> <p>2/24</p>	<p>N=19,479</p> <p>21-39y</p> <p>100% female</p> <p>100% African American</p> <p>BMI range: 18.5-29.9kg/m²</p>	<p>Self-reported restaurant food intake; participants asked how often they had eaten 6 specific foods (burgers, fried chicken, fried fish, pizza, Chinese food, Mexican food) from a restaurant or fast-food establishment in the past year.</p> <p>Self-report height and weight (baseline and every 2y); validation study indicated high correlation with measured height/weight (r=0.93 and r=0.97, respectively)</p>	<p>Risk of obesity and frequency of restaurant food intake:</p> <p><i>Hamburgers, >1/week</i> (ref: <5/year): HR=1.27 (95%CI=1.14-1.41); P for trend=<0.001</p> <p><i>Fried chicken, >1/week</i> (ref:<5 times/year): HR=1.08 (95%CI =0.96-1.21); P for trend=0.02</p> <p><i>Pizza, >1/week</i> (ref: <5 times/year): HR=1.08 (95%CI =0.92-1.27); P for</p>



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			<p>trend=0.04</p> <p><i>Chinese food, >1/week</i> (ref: <5 times/year): HR=1.20 (95%CI=1.05-1.37); P for trend=0.05</p> <p><i>Mexican food, >1/week</i> (ref: <5 times/year): NS</p> <p><i>Fried fish, >1/week</i> (ref: <5 times/year): NS</p> <p>After adjustment for sugar sweetened soda intake, only the HR for consumption of burgers from restaurants remained significant: HR1.26 (95%CI = 1.14-1.40), P-trend <0.001</p>
<p>Duffey, 2009 PC; 13y Coronary Artery Risk Development in Young Adults (CARDIA) study, USA 1/24</p>	<p>N=1,633 for weight N=1,637 for Waist circumference (WC)</p> <p>Time varying exposure: N=3,987 for weight N=3,982 for WC 32.0y (SD=3.6)</p> <p>54.5% female</p> <p>51.6 % Black, 48.4% White</p> <p>Mean BMI: 26.8kg/m²</p>	<p>Self-reported frequency of restaurant and fast food consumption; data from mean of 7y and 10y exam and 20y exam; interviewer-administered questionnaire: How many times in a week or month do you eat breakfast, lunch or dinner in a place such as McDonald's, Burger King, Wendy's, Arby's, Pizza Hut, or Kentucky Fried Chicken? How many times in a week or month do you eat breakfast, lunch, or dinner at a restaurant or cafeteria?</p> <p>Measured height and weight and waist</p>	<p>Weight and waist circumference (WC): Increase of 1 time/week consumption of fast food associated with weight gain, but not an increase in WC at 13y follow-up:</p> <p><i>Body weight:</i> $\beta=0.15$, P<0.001 <i>WC:</i> NS</p> <p>Increase of 1 time/ week consumption of restaurant food at 13y follow-up:</p> <p><i>Body weight:</i> NS</p>



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		circumference	WC: NS
Duffey, 2007 PC; 3y Coronary Artery Risk Development in Young Adults (CARDIA) study, USA 4/24	N=3,394 Mean age: 25y NR 47% African American Mean BMI: 27kg/m ²	See above	BMI A one unit increase in fast food consumption (1 time/week) at year 7 was associated with an increase in year 10 BMI ($\beta=0.16$; 95% CI: 0.06, 0.25; P 0.001; Restaurant intake: NS
Pereira, 2005 PC, 15y Coronary Artery Risk Development in Young Adults (CARDIA) study, USA 2/24	N=3,031 Mean age: 25y 52% female 52% white, 48% black Mean BMI: 25kg/m ²	See above	Weight change by race Baseline fast food intake (three times per week differences between participants) and body weight at follow-up: <i>Blacks:</i> $\beta=2.22$ (SE=0.72), P=0.0014 <i>Whites:</i> $\beta=1.56$ (SE=0.55), P=0.0064 Change in fast food intake (three times per week change) during follow-up: <i>Blacks:</i> NS <i>Whites:</i> $\beta=1.84$ (SE=0.44), P=<0.0001 Compared to participants with infrequent fast food intake (<1



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			time/week) those with frequent (>2 times/week) consumption of fast food gained an extra 4.5kg at follow-up (P=0.0054)
French, 2000 PC, 3y Pound of Prevention Study, USA 2/24	N=891 Mean: 35 years 100% female 86% White Mean BMI: 27kg/m ²	Self-reported frequency of fast food restaurant use was estimated with the question, "About how many meals per week do you eat from fast food restaurants?" Measured height and weight	Weight change An increase of one fast food meal/week over the 3 y study period was associated with a weight gain of 0.72 kg (1.6 lb) above the average weight gain over the three year period (P<0.01)
Li, 2009 PC, 1y Portland Neighborhood Environment and Health Study, USA 2/24	N=1,145 ~62y 43% female 92% white Mean BMI: 29kg/m ²	Self-reported weekly visits to " local " fast-food restaurants via survey at Baseline and 1y Measured height and weight	Weight and waist circumference Increased visits to fast food restaurants: <i>Weight:</i> $\beta=0.65$ (SE=0.32), P<0.05 <i>Waist Circumference:</i> $\beta=1.06$ (SE=0.41), P<0.05 Increased fast food restaurant visits for participants living in high fast food dense neighborhoods: <i>Weight:</i> $\beta=1.40$ (SE=0.61), P<0.05; <i>Waist circumference:</i> $\beta=2.06$ (SE=0.41), P<0.05