

Tomato/Tomato-based foods and Disease Risk
Gastric Cancer Critical Findings

Disease type	First Author	Study Title and Complete Citation	Date	Abstract	Study Type	G.Tom +, N, -	P.Tom +, N, -	F.Tom +, N, -	Lyco +, N, -	Other +, N, -
Cancer: gastric	Graham S	Diet in the epidemiology of gastric cancer. Graham S, Haughey B, Marshall J, Brasure J, Zielesny M, Freudenheim J, West D, Nolan J, Wilkinson G. Nutr Cancer. 1990;13(1-2):19-34.	1990	We examined the nutritional epidemiology of gastric cancer in 293 cases and neighborhood-, age-, and sex-matched controls in communities throughout the counties of Niagara, Monroe, and Erie in western New York. The interview was highly detailed, requiring two and one-half hours to complete; it attempted to provide an estimate of total calories ingested as well as of macro- and micronutrients and behaviors that could affect alimentary exposures, such as the use of refrigeration. We found that risk was enhanced by sodium, fat, and retinol. Substantial reductions in risk were associated with ingestion of carotene, especially raw vegetables (including celery, cucumbers, carrots, green peppers, tomatoes, and onions), as well as with increased use of low-temperature food storage. Both refrigeration and carotene could inhibit oxidation products that could act as carcinogens in the stomach.	CC	(-)				
Cancer: gastric	Franceschi S	Tomatoes and risk of digestive-tract cancers. Franceschi S, Bidoli E, La Vecchia C, Talamini R, D'Avanzo B, Negri E. Int J Cancer. 1994 Oct 15;59(2):181-4.	1994	In view of the persisting uncertainty concerning possible mechanisms by which high vegetable and fruit intake decreases cancer risk, foods with divergent values for potentially important micronutrients are a priority for investigation. Tomatoes are low in beta-carotene, but high in lycopene, an active antioxidative agent. In order to assess the effect of tomatoes on risk of cancers of the digestive tract, data were analyzed from an integrated series of case-control studies conducted between 1985 and 1991 in northern Italy, where tomato intake is high but, also, heterogeneous. The overall dataset included the following histologically confirmed cancer cases: oral cavity and pharynx, 314; esophagus, 85; stomach, 723; colon, 955; and rectum, 629; and a total of 2,879 controls admitted to hospital for acute non-neoplastic or non-digestive conditions, unrelated to long-term dietary modifications. Multivariate odds ratios (OR) and 95% confidence interval (CI) for subsequent quartiles of intake of raw tomatoes were derived, after allowance for age, sex,	CC			(-)		

				study center, education, smoking and drinking level, and tertile of total caloric intake. There was a consistent pattern of protection for all sites (OR in the upper quartile ranging between 0.4 and 0.7), most notably for gastrointestinal neoplasms. All trends in risk were highly significant. The beneficial effect of raw tomatoes in this population may be partly due to the fact that they constitute perhaps the most specific feature of the Mediterranean diet. However, if it is true that tomatoes protect against digestive-tract cancers, this is of interest from both a scientific and a public health viewpoint.						
Cancer: gastric	Gao C	Protective effect of allium vegetables against both esophageal and stomach cancer: a simultaneous case-referent study of a high-epidemic area in Jiangsu Province, China. Gao CM, Takezaki T, Ding JH, Li MS, Tajima K. Jpn J Cancer Res. 1999 Jun;90(6):614-21.	1999	To study the relation between allium vegetable intake and cancer of the esophagus (EC) and stomach (SC) in Yangzhong city, which is one of the highest-risk areas for these cancers in Jiangsu province, China, a simultaneous case-referent study was conducted using histopathologically confirmed cases (EC: n = 81, SC: n = 153) and population-based referents (n = 234). A questionnaire was used to collect information on the general status of subjects, their dietary habits, frequency intake of allium vegetables and other foods, tea consumption, smoking and alcohol drinking. The odds ratios (ORs) and 95% confidence intervals (CIs) were estimated by a multiple logistic regression model. The results showed that frequent intake of allium vegetables (including garlic, onion, Welsh onion and Chinese chives), raw vegetables, tomatoes and snap beans, and tea consumption were inversely associated with the risk for EC and SC. In the highest consumption category (> or = 1 time/week) of garlic, onion, Welsh onion and Chinese chives, the adjusted ORs compared with the lowest category (< 1 time/month) were 0.30 (CI = 0.19-0.47), 0.25 (CI = 0.11-0.54), 0.15 (CI = 0.08-0.26), and 0.57 (CI = 0.23-1.42) for EC, and 0.31 (CI = 0.22-0.44), 0.17 (CI = 0.08-0.36), 0.22 (CI = 0.15-0.31) and 0.40 (CI = 0.17-0.94) for SC, respectively. The main results in the present study suggested that allium vegetables, like raw vegetables, may have an important protecting effect against not only stomach cancer, but also esophageal cancer.	CC	(-)				
Cancer: gastric	De Stefani E	Tomatoes, tomato-rich foods, lycopene and cancer of the upper aerodigestive tract: a case-control in	2000	In order to study the relationship between tomatoes, tomato products, lycopene and cancers of the upper aerodigestive tract (UADC; oral cavity, pharynx, larynx, esophagus) a case-control study was carried out in Uruguay, in the time period 1996-98. Two-hundred and thirty eight cases and 491 hospitalized controls were frequency matched on age, sex, residence and urban/rural status. Both series were submitted to a detailed questionnaire, including tobacco smoking, alcohol	CC	(-)	(-)	(-)	(-)	

		<p>Uruguay.</p> <p>De Stefani E, Oreggia F, Boffetta P, Deneo-Pellegrini H, Ronco A, Mendilaharsu M.</p> <p>Oral Oncol. 2000 Jan;36(1):47-53.</p>	<p>drinking and queries on 64 food items. These data were analyzed by unconditional logistic regression, after adjusting by total energy intake. Tomato intake was associated with a reduction in risk of 0.30 (95% confidence interval [CI], 0.18-0.51), whereas tomato sauce-rich foods displayed a protective effect of 0.57 (95% CI, 0.33-0.96 for the highest quartile of intake). The food group composed of raw tomato and tomato-rich foods showed a strong inverse association with UADC (odds ratio [OR], 0.23; 95% CI, 0.13-0.39 for the highest quartile of intake). Lycopene was also strongly associated with a reduced risk of 0.22 (95% CI, 0.13-0.37). Adjustment of tomato intake for several phytochemicals explained almost completely its protective effect, which disappears in this model. Finally, the joint effect of lycopene and total phytosterols was associated with a significant reduction in risk (OR, 0.11; 95% CI, 0.05-0.23).</p>						
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