Tomato/Tomato-based foods and Disease Risk
Colorectal 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: colorectal	La Vecchia C	Tomatoes, lycopene intake, and digestive tract and female hormone-related neoplasms. La Vecchia C. Exp Biol Med. 2002 Nov;227(10):860-3.	2002	Tomato consumption showed a consistent inverse relation with the risk of digestive tract neoplasms in Italy in an integrated series of studies conducted in the 1980s. Another series of case-control studies was conducted between 1992 and 1999 in different areas of Italy. Cases were patients below age 80 with incident, histologically confirmed cancer of the oral cavity and pharynx (n = 754), esophagus (n = 304), colorectum (n = 1953), breast (n = 2529), and ovary (n = 1031). The comparison group involved, overall, over 5000 patients below age 80 with acute, non-neoplastic, nonhormone-related diseases, unrelated to long-term diet modifications and admitted to the same network of hospitals. Information was collected in hospital by trained interviewers using a validated food frequency questionnaire, including 78 foods or groups of foods, various alcoholic beverage, and fat-intake pattern. The multivariate relative risk (RR) of oral, pharyngeal, and esophageal cancer decreased across subsequent levels of lycopene intake to reach 0.7 (95% confidence interval [CI] 0.4-1.0) for oral and pharyngeal, and 0.7 (95% CI 0.4-1.1) for esophageal cancer in the highest quintile of intake. Both trends in risk were of borderline statistical significance. With reference to colorectal, breast, and ovarian cancer, although no consistent association was observed for lycopene (RR = 1.0 for colorectal, 1.2 for breast, and 1.1 for ovary in the highest quintile), tomato intake was inversely and significantly related with colorectal cancer (RR = 0.8). The inverse relation between lycopene and upper digestive tract neoplasms was not explained by alcohol or tobacco, sociodemographic factors, or total energy intake. The interpretation of such an inverse relation, however, remains open to discussion because it may be related to an effect of lycopene due to its antioxidant effect and/or a potential role of lycopene in decreasing insulin growth factor I, which is a promoter in the process of carcinogenesis.	CC	(-)				

Cancer: colorectal	Schnabele K	Effects of carrot and tomato juice consumption on faecal markers relevant to colon carcinogenesis in humans. Schnabele K, Briviba K, Bub A, Roser S, Pool-Zobel BL, Rechkemmer G. Br J Nutr. 2008 Mar;99(3):606-13.	2008	High intakes of carotenoid-rich fruits and vegetables are associated with a reduced risk of various cancers including colon cancer. A human intervention study with carrot and tomato juice should show whether a diet rich in carotenoids, especially high in beta-carotene and lycopene, can modify luminal processes relevant to colon carcinogenesis. In a randomised cross-over trial, twenty-two healthy young men on a low-carotenoid diet consumed 330 ml tomato or carrot juice per d for 2 weeks. Intervention periods were preceded by 2-week depletion phases. At the end of each study period, faeces of twelve volunteers were collected for chemical analyses and use in cell-culture systems. Consumption of carrot juice led to a marked increase of beta-carotene and alpha-carotene in faeces and faecal water, as did lycopene after consumption of tomato juice. In the succeeding depletion phases, carotenoid contents in faeces and faecal water returned to their initial values. Faecal water showed high dose-dependent cytotoxic and anti-proliferative effects on colon adenocarcinoma cells (HT29). These effects were not markedly changed by carrot and tomato juice consumption. Neither bile acid concentrations nor activities of the bacterial enzymes beta-glucosidase and beta-glucuronidase in faecal water changed after carrot and tomato juice consumption. Faecal water pH decreased only after carrot juice consumption. SCFA were probably not responsible for this effect, as SCFA concentrations and profiles did not change significantly. In summary, in the present study, 2-week interventions with carotenoid-rich juices led only to minor changes in investigated luminal biomarkers relevant to colon carcinogenesis.	RCT & cell culture		N			↑ fecal lyco amount with juice