Supplementary Table 1. Extracted data of studies on dietary carbohydrate intake and the risk of digestive system cancers

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| study | Types of cancer | Gender | Exposure level  (g/d) | RR/HR/OR | Controlled factors |
| **Cohort studies** | | | | | |
| Tasevska,2012(1)  Tasevska,2012(2) | Esophageal Cancer  Esophageal Cancer | Men  Women | Q1: N/A  Q2: N/A  Q3: N/A  Q4: N/A  Q5: N/A  Q1: N/A  Q2: N/A  Q3: N/A | 1  1.07(0.78-1.47)  1.06(0.76-1.49)  1.14(0.79-1.63)  **1.09(0.73-1.63)**  1  1.27(0.68-2.36)  **1.41(0.69-2.91)** | Age, BMI, family history of cancer, marital status, smoking, race, education, physical activity, energy intake and alcohol intake, vegetable, intake.  Age, BMI, family history of cancer, marital status, smoking, race, education, physical activity, energy intake and alcohol intake, vegetable red meat, beta-carotene and vitamin C intake. |
| Sieri, 2017(1)  Sieri, 2017(2) | Gastric cancer  Gastric cancer | M and W  M and W | High GI  Q1:N/A  Q2:N/A  Q3:N/A  Q4:N/A  Q5:N/A  Low GI  Q1:N/A  Q2:N/A  Q3:N/A  Q4:N/A  Q5:N/A | 1  0.63(0.38-1.05)  0.68(0.41-1.14)  0.61(0.36-1.05)  **0.51(0.27-0.94)**  1  1.18(0.69-2.03)  1.21(0.70-2.11)  1.10(0.62-1.94)  **1.36(0.78-2.37)** | sex, education, smoking status, BMI, alcohol  intake, fibre intake, saturated fat intake, non-alcohol energy intake and physical activity.  sex, education, smoking status, BMI, alcohol  intake, fibre intake, saturated fat intake, non-alcohol energy intake and physical activity |
| Larsson, 2006 | Gastric cancer | Women | Q1:218  Q2:225  Q3:230  Q4:234  Q5:246 | 1  0.76(0.44-1.29)  0.83(0.49-1.41)  0.98(0.59-1.61)  **0.85(0.50-1.43)** | age, education, BMI and intakes of total energy and alcohol. |
| Makarem,2017 | Colorectal Cancer | M and W | T1:N/A  T2:N/A  T3:N/A | 1  1.26(0.68-2.34)  **1.45(0.70-3.04)** | age, sex, smoking, alcohol, energy, red and processed meat intake and fibre intake |
| Sieri, 2014 | Colorectal Cancer | M and W | Q1:237  Q2:245  Q3:272  Q4:350 | 1  1.34(0.99-1.82)  1.27(0.89-1.82)  **1.51(0.97-2.34)** | sex, education, smoking status, BMI, alcohol intake, calcium intake, folate intake, fibre intake, saturated fat intake, nonalcohol energy and physical activity. |
| Li, 2011 | Colorectal Cancer | Women | Q1:242.2  Q2:261.1  Q3:273.3  Q4:285.3  Q5:302.3 | 1  0.80(0.60-1.06)  0.62(0.46-0.84)  0.75(0.57-1.01)  **0.87(0.66-1.15)** | age, education, income, BMI, physical activity, family history of colorectal cancer, total energy intake, and hormone therapy use. |
| Howarth,  2008(1)  Howarth,  2008(2) | Colorectal Cancer  Colorectal Cancer | Men  Women | Q1:N/A  Q2:N/A  Q3:N/A  Q4:N/A  Q5:N/A  Q1:N/A  Q2:N/A  Q3:N/A  Q4:N/A  Q5:N/A | 1  1.08(0.89-1.32)  1.19(0.97-1.47)  1.12(0.89-1.41)  **1.09(0.84-1.40)**  1  0.91(0.73-1.13)  0.95(0.76-1.19)  0.86(0.67-1.10)  **0.71(0.53-0.95)** | age, ethnicity, time since cohort entry, family history of colorectal cancer, history of colorectal polyp, cigarette smoking, BMI, hours of vigorous activity, NSAID use, multivitamin use, energy intake, alcohol, red meat, folate, vitamin D, calcium, and dietary fiber intakes  age, ethnicity, time since cohort entry, family history of colorectal cancer, history of colorectal polyp, cigarette smoking, BMI, hours of vigorous activity, NSAID use, multivitamin use, energy intake, replacement hormone use, alcohol, red meat, folate, vitamin D, calcium, and dietary fiber intakes |
| Kabat, 2008 | Colorectal Cancer | Women | Q1:<131.6  Q2:131.6-171.4  Q3:171.4-209.2  Q4:209.2-260.1  Q5:>260.1 | 1  0.85(0.71-1.01)  0.96(0.79-1.18)  0.97(0.76-1.23)  **0.89(0.64-1.25)** | age, education, smoking, BMI, height, hormone replacement therapy, history of diabetes, family history of colorectal cancer, physical activity, , and intakes of total fiber, energy, and dietary calcium. |
| Strayer, 2007 | Colorectal Cancer | Women | Q1:N/A  Q2:N/A  Q3:N/A  Q4:N/A  Q5:N/A | 1  0.89(0.67-1.18)  0.83(0.63-1.11)  0.85(0.64-1.12)  **0.86(0.66-1.13)** | age, dietary calories, NSAIDS use, smoking, menopausal female hormone use, screened for colorectal cancer, BMI, and fiber intake |
| Larsson, 2006 | Colorectal Cancer | Women | Q1:<211  Q2:211-222  Q3:223-233  Q4:234-245  Q5:>245 | 1  1.01(0.80-1.27)  0.98(0.77-1.24)  1.05(0.83-1.34)  **1.10(0.85-1.44)** | education, BMI, total energy  intake, and quartiles of intakes of alcohol, cereal fiber, folate, calcium, magnesium, and red meat. |
| Michaud, 2005(1)  Michaud, 2005(2) | Colorectal Cancer  Colorectal Cancer | Men  Women | Q1:182  Q2:214  Q3:234  Q4:256  Q5:288  Q1:110  Q2:137  Q3:155  Q4:174  Q5:202 | 1  1.11(N/A)  1.21(N/A)  1.24(N/A)  **1.27(0.93-1.72)**  1  1.07(N/A)  1.11(N/A)  0.94(N/A)  **0.87(0.68-1.11)** | age, family history of colon cancer, prior endoscopy screening, aspirin use, height, BMI, smoking, physical activity, and intakes of cereal fiber, alcohol, calcium, folate, processed meat and beef, pork or lamb as main dish.  age, family history of colon cancer, prior endoscopy screening, aspirin use, height, BMI, smoking, physical activity, and intakes of cereal fiber, alcohol, calcium, folate, processed meat and beef, pork or lamb as main dish. |
| Higginbotham, 2004 | Colorectal Cancer | Women | Q1:177  Q2:205  Q3:222  Q4:237  Q5:267 | 1  1.04(0.59-1.85)  1.58(0.88-2.83)  1.71(0.89-3.29)  **2.41(1.10-5.27)** | age, BMI, history of oral contraceptive use, postmenopausal hormone use, family history of colorectal cancer, smoking, alcohol use, physical activity, NSAIDs use, total energy intake, energy-adjusted total fiber/ total fat/ folate/ calcium,/ vitamin D intake. |
| Terry, 2003 | Colorectal Cancer | Women | Q1:<143  Q2:143-175  Q3:175-207  Q4:207-249  Q5:>249 | 1  1.16(0.88-1.53)  1.01(0.75-1.36)  0.92(0.66-1.27)  **1.01(0.68-1.51)** | age, intake of energy, study center, treatment allocation, BMI, cigarette smoking, education, physical activity, oral contraceptive use, hormone replacement therapy, parity, and quartiles of alcohol, red meat, and folic acid. |
| Sieri, 2017(1)  Sieri, 2017(2) | Liver  cancer  Liver cancer | M and W  M and W | High GI  Q1:N/A  Q2:N/A  Q3:N/A  Q4:N/A  Q5:N/A  Low GI  Q1:N/A  Q2:N/A  Q3:N/A  Q4:N/A  Q5:N/A | 1  0.72(0.33-1.60)  0.88(0.40-1.93)  0.84(0.36-1.92)  **1.43(0.60-3.37)**  1  1.09(0.49-2.45)  1.43(0.65-3.15)  1.40(0.62-3.15)  **1.41(0.61-3.28)** | sex, education, smoking status, BMI, alcohol  intake, fibre intake, saturated fat intake, non-alcohol energy intake and physical activity.  sex, education, smoking status, BMI, alcohol  intake, fibre intake, saturated fat intake, non-alcohol energy intake and physical activity |
| Fedirko, 2013(1)  Fedirko, 2013(2) | HCC  IBDC | M and W  M and W | Q1:186.0  Q2:222.8  Q3:247.6  Q4:290.2  Q1:186.0  Q2:222.8  Q3:247.6  Q4:290.2 | 1  0.84(0.55-1.29)  0.92(0.58-1.46)  **1.06(0.64-1.75)**  1  0.87(0.59-1.30)  0.96(0.64-1.44)  **0.92(0.59-1.44)** | Sex, center total energy intake, physical activity, education, BMI, smoking status, DM and alcohol intake,  Sex, center total energy intake, physical activity, education, BMI, smoking status, DM and alcohol intake, |
| Vogtmann, 2013(1)  Vogtmann, 2013(2) | Liver cancer  Liver cancer | Men  Women | Q1:292.5  Q2:321.3  Q3:337.9  Q4:353.8  Q5:377.7  Q1:253.6  Q2:276.8  Q3:290.6  Q4:303.5  Q5:323.4 | 1  1.51(0.99-2.30)  0.96(0.60-1.54)  0.94(0.58-1.50)  **1.15(0.73-1.81)**  1  0.72(0.41-1.25)  0.80(0.47-1.36)  0.58(0.33-1.03)  **0.85(0.51-1.41)** | age, education, income, smoking status, alcohol consumption, menopausal status (women only), family history of liver cancer, BMI,  physical activity, total energy intake, and history of diabetes and hepatitis/ chronic liver disease  age, education, income, smoking status, alcohol consumption, family history of liver cancer, BMI,  physical activity, total energy intake, and history of diabetes and hepatitis/ chronic liver disease |
| Sieri, 2017(1)  Sieri, 2017(2) | Pancreatic  cancer  Pancreatic  cancer | M and W  M and W | High GI  Q1:N/A  Q2:N/A  Q3:N/A  Q4:N/A  Q5:N/A  Low GI  Q1:N/A  Q2:N/A  Q3:N/A  Q4:N/A  Q5:N/A | 1  0.83(0.48-1.45)  0.60(0.32-1.13)  0.96(0.54-1.72)  **0.75(0.38-1.51)**  1  1.86(1.04-3.32)  1.67(0.91-3.07)  0.88(0.43-1.78)  **1.33(0.68-2.57)** | sex, education, smoking status, BMI, alcohol  intake, fibre intake, saturated fat intake, non-alcohol energy intake and physical activity.  sex, education, smoking status, BMI, alcohol  intake, fibre intake, saturated fat intake, non-alcohol energy intake and physical activity |
| Meinhold, 2010 | Pancreatic  cancer | M and W | Q1:N/A  Q2:N/A  Q3:N/A  Q4:N/A  Q5:N/A | 1  0.82(0.52-1.30)  1.07(0.69-1.66)  1.22(0.79-1.88)  **1.56(1.02-2.37)** | sex, total energy, cigarette smoking status, and BMI |
| Simon, 2010 | Pancreatic  cancer | Women | Q1:203  Q2:230  Q3:252  Q4:285 | 1  0.70(0.49-1.00)  0.78(0.54-1.10)  **0.80(0.56-1.15)** | age, race, income, BMI, physical activity, history of diabetes, alcohol use, and smoking status. |
| Heinen, 2008 | Pancreatic  cancer | M and W | Q1:155  Q2:172  Q3:184  Q4:199  Q5:256 | 1  0.95(0.66-1.35)  0.98(0.68-1.41)  0.94(0.64-1.37)  **1.03(0.69-1.52)** | sex, age, energy intake, smoking, alcohol, history of diabetes mellitus, history of hypertension, BMI, and intake of vegetables, fruit, and fiber. |
| Nöthlings, 2007 | Pancreatic  cancer | M and W | Q1:N/A  Q2:N/A  Q3:N/A  Q4:N/A | 1  1.05(0.79-1.39)  1.14(0.85-1.53)  **1.04(0.75-1.46)** | race, age, smoking status, family history of pancreatic cancer, energy intake, intakes of red meat and processed meat, and BMI. |
| Patel, 2007(1)  Patel, 2007(2) | Pancreatic  Cancer  Pancreatic  cancer | Men  Women | Q1:<162.6  Q2:162.6-181.6  Q3:181.6-198.3  Q4:198.3-218.9  Q5:>218.9  Q1:<130.0  Q2:130.0-146.1  Q3:146.1-160.3  Q4:160.3-177.2  Q5:>177.2 | 1  1.34(0.89-2.03)  0.83(0.52-1.32)  1.06(0.69-1.65)  **1.28(0.83-1.96)**  1  1.18(0.76-1.83)  0.90(0.56-1.44)  0.92(0.57-1.47)  **0.90(0.56-1.45)** | age, sex, race, BMI, history of gallstones, smoking, total energy intake, family history of pancreatic cancer, location of weight gain, and sedentary behavior  age, sex, race, BMI, history of gallstones, smoking, total energy intake, family history of pancreatic cancer, location of weight gain, and sedentary behavior |
| Silvera, 2005 | Pancreatic  cancer | M and W | Q1:<152  Q2:152-191  Q3:192-236  Q4:>236 | 1  0.49(0.28-0.90)  0.60(0.33-1.07)  **0.63(0.31-1.26)** | age, BMI, alcohol, smoking, parity, energy intake, study center, and randomization group |
| **Case-control studies** | | | | | |
| Li, 2017 | Esophageal Cancer | M and W | Q1:N/A  Q2:N/A  Q3:N/A  Q4:N/A  Q5:N/A | 1  0.98(0.68-1.41)  0.91(0.62-1.33)  0.93(0.62-1.39)  **0.93(0.56-1.54)** | age, sex, race, study indicator, BMI, fruits and vegetables intake, cigarette smoking |
| Lahmann,2014(1)  Lahmann,2014(2) | EAC  ESCC | M and W  M and W | Q1:196  Q2:224  Q3:245  Q4:273  Q1:196  Q2:224  Q3:245  Q4:273 | 1  1.14(0.77-1.68)  0.90(0.59-1.38)  **0.79(0.49-1.25)**  1  0.81(0.54-1.21)  0.55(0.35-0.87)  **0.46(0.28-0.75)** | age, sex, education, BMI, smoking, physical activity, alcohol intake, acid reflux symptoms, NSAIDs use, presence of diabetes, total fruit intake (except for fiber intake), red meat, processed meat, and total energy.  age, sex, education, BMI, smoking, physical activity, alcohol intake, acid reflux symptoms, NSAIDs use, presence of diabetes, total fruit intake (except for fiber intake), red meat, processed meat, and total energy. |
| Eslamian,2013 | Esophageal Cancer | M and W | T1: N/A  T2: N/A  T3: N/A | 1  0.77(0.35-2.77)  **1.89(0.53-2.81)** | age, sex, GERD symptoms, BMI, smoking status, physical activity, food and beverage temperature, and fruit and vegetable consumption. |
| Chen, 2002 | Esophageal Cancer | M and W | Q1: N/A  Q2: N/A  Q3: N/A  Q4: N/A | 1  1.10(0.60-2.10)  0.90(0.50-1.60)  **0.40(0.20-0.90)** | age, age squared, gender, respondent type, BMI, alcohol use, tobacco use,  education, family history of respective cancers, and vitamin supplement use. |
| Mayne, 2001(1)  Mayne, 2001(2) | EAC  ESCC | M and W  M and W | Q75% VS Q25%  Q75% VS Q25% | **0.34(0.20-0.58)**  **0.68(0.37-1.25)** | sex; site; age; race; proxy status; income; education; BMI; cigarettes; years of consuming beer, wine, and liquor; and energy intake. |
| Li, 2017 | Gastric  Cancer | M and W | Q1:N/A  Q2:N/A  Q3:N/A  Q4:N/A  Q5:N/A | 1  0.94(0.67-1.32)  0.79(0.55-1.13)  0.97(0.67-1.41)  **0.94(0.59-1.52)** | age, sex, race, study indicator, BMI, fruits and vegetables intake, cigarette smoking |
| Lazarević,2009 | Gastric  Cancer | M and W | T1: N/A  T2: N/A  T3: N/A | 1  0.40(0.19-0.88)  **0.07(0.02-0.23)** | age, sex, residence, education, physical activity, total energy intake, meals regularity, rapid eating, overeating at each meal, and history of cancer in the first degree |
| Qiu, 2005 | Gastric  Cancer | Men | Q1:N/A  Q2:N/A  Q3:N/A  Q4:N/A | 1  1.39(0.47-4.11)  1.60(0.41-6.27)  **2.14(0.35-13.0)** | age, present residence, education, economic status, smoking, alcoholics and total calories intake |
| Lissowska,2004 | Gastric  Cancer | M and W | Q1:N/A  Q2:N/A  Q3:N/A  Q4:N/A | 1  1.01(0.64-1.60)  1.50(0.96-2.33)  **1.39(0.89-2.18)** | age, sex, education, smoking and calories from foods. |
| Chen, 2002 | Gastric  Cancer | M and W | Q1:N/A  Q2:N/A  Q3:N/A  Q4:N/A | 1  0.50(0.30-1.00)  0.50(0.20-0.90)  **0.40(0.20-0.80)** | age, age squared, gender, respondent type, BMI, alcohol use, tobacco use,  education, family history of respective cancers, and vitamin supplement use. |
| Mayne, 2001(1)  Mayne, 2001(2) | GCA  NCGC | M and W  M and W | Q75% VS Q25%  Q75% VS Q25% | **0.70(0.42-1.17)**  **0.64(0.40-1.01)** | sex; site; age; race; proxy status; income; education; BMI; cigarettes; years of consuming beer, wine, and liquor; and energy intake. |
| Munoz, 2001 | Gastric  Cancer | M and W | Q1: N/A  Q2: N/A  Q3: N/A  Q4: N/A | 1  1.64(0.99-2.72)  1.98(1.20-3.28)  **3.12(1.95-5.02)** | age, sex, alcohol, tobacco, total calories and SES. |
| Palli, 2001 | Gastric  Cancer | M and W | T1: N/A  T2: N/A  T3: N/A | 1  1.10(0.80-1.50)  **1.00(0.70-1.30)** | age, sex, social class, family history of gastric cancer, area, BMI, total energy and tertiles of the residuals of each nutrient of interest |
| Huang, 2018 | Colorectal Cancer | M and W | Q1:221.0  Q2: 274.5  Q3: 304.1  Q4: 330.7 | 1  0.75(0.62-0.90)  0.74(0.61-0.90)  **0.85(0.70-1.03)** | age, sex, marital status, residence, education, occupation, income level, smoking, alcohol drinking, family history of cancer, physical activity. |

M: men; W: Women; GI: glycemic index; GERD: gastro-esophageal reflux disease; EAC: esophageal adenocarcinoma; ESCC: esophageal squamous cell carcinoma; BMI: body mass index; NSAID: non-steroidal anti-inflammatory drug; GCA: gastric cardia adenocarcinoma; NCGC: Noncardia gastric cancer; CC: colon cancer; RC: rectal cancer; HCC: hepatocellular carcinoma; IBDC: intrahepatic bile duct carcinoma; DHQ: diet history questionnaire; NCI: the National Cancer Institute; DQ: dietary questionnaire; SES: socio-economic status; Q: quartile or quintile; T: tertile

Supplementary Table 2. Extracted data of studies on glycemic index and the risk of digestive system cancers

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Study | Types of cancer | Gender | Exposure level | Reference  food | RR/HR/OR | Controlled factors |
| **Cohort studies** | | | | | | |
| George, 2009(1)  George, 2009(2) | Esophageal Cancer  Esophageal Cancer | Men  Women | Q1:33.5-51.3  Q2:51.3-53.3  Q3:53.3-55.0  Q4:55.0-57.0  Q5:57.0-84.1  Q1:33.6-50.4  Q2:50.4-52.6  Q3:52.6-54.4  Q4:54.4-56.6  Q5:56.6-83.9 | glucose  glucose | 1  1.23(0.89-1.70)  1.03(0.74-1.44)  1.24(0.90-1.71)  **1.50(1.10-2.05)**  1  0.95(0.43-2.08)  1.10(0.51-2.35)  1.43(0.70-2.94)  **1.27(0.60-2.67)** | Age, race, education, marital status, BMI, family history of cancer, physical activity, smoking, alcohol consumption, total energy intake  Age, race, education, marital status, BMI, family history of cancer, physical activity, smoking, alcohol consumption, total energy intake, and menopausal hormone therapy use |
| Sieri, 2017 | Gastric cancer | M and W | Q1:50.0  Q2:N/A  Q3: N/A  Q4: N/A  Q5: 57.4 | glucose | 1  0.72(0.44-1.17)  0.90(0.56-1.43)  0.52(0.30-0.91)  **0.66(0.40-1.12)** | sex, education, smoking status, BMI, alcohol intake, fibre intake, saturated fat intake, non-alcohol energy intake and physical activity |
| Larsson, 2006 | Gastric cancer | Women | Q1:N/A  Q2: N/A  Q3: N/A  Q4: N/A  Q5: N/A | glucose | 1  0.87(0.53-1.43)  0.98(0.61-1.59)  0.80(0.47-1.33)  **0.77(0.46-1.30)** | age, education, BMI and intakes of total energy and alcohol. |
| Makarem,2017 | Colorectal Cancer | M and W | T1:N/A  T2:N/A  T3:N/A | glucose | 1  1.61(0.87-2.98)  **1.51(0.81-2.84)** | age, sex, smoking, alcohol, energy, red and processed meat intake and fibre intake |
| Abe, 2016(1)  Abe, 2016(2) | Colorectal Cancer  Colorectal Cancer | Men  Women | Q1:55.3  Q2:60.9  Q3:64.1  Q4:68.1  Q1:54.1  Q2:59.3  Q3:62.4  Q4:66.5 | glucose  glucose | 1  0.90(0.74-1.09)  1.04(0.85-1.26)  **0.92(0.73-1.14)**  1  1.02(0.80-1.30)  1.11(0.87-1.43)  **0.97(0.73-1.30)** | age, area, alcohol consumption, smoking status, BMI, quartile of metabolic equivalent tasks, DM, colorectal screening, intakes quartile of energy-adjusted calcium, magnesium, vitamin B6, vitamin B12, folate, vitamin D, n-3 polyunsaturated fatty acids, fiber, and red meat  age, area, alcohol consumption, smoking status, BMI, quartile of metabolic equivalent tasks, DM, colorectal screening, menopausal status, use of exogenous female hormones, intakes quartile of energy-adjusted calcium, magnesium, vitamin B6, vitamin B12, folate, vitamin D, n-3 polyunsaturated fatty acids, fiber, and red meat |
| Sieri, 2014 | Colorectal Cancer | M and W | Q1:50.4  Q2:52.6  Q3:54.3  Q4:56.6 | glucose | 1  1.04(0.79-1.38)  1.06(0.80-1.41)  **1.35(1.03-1.78)** | sex, education, smoking status, BMI, alcohol intake, calcium intake, folate intake, fibre intake, saturated fat intake, nonalcohol energy and physical activity. |
| Li, 2011 | Colorectal Cancer | Women | Q1:64.4  Q2:68.4  Q3:70.8  Q4:73.1  Q5:76.0 | glucose | 1  1.13(0.84-1.53)  0.86(0.63-1.18)  0.99(0.73-1.34)  **1.09(0.81-1.46)** | age, education, income, BMI, physical activity, family history of colorectal cancer, total energy intake, and hormone therapy use. |
| George, 2009(1)  George, 2009(2) | Colorectal Cancer  Colorectal Cancer | Men  Women | Q1:33.5-51.3  Q2:51.3-53.3  Q3:53.3-55.0  Q4:55.0-57.0  Q5:57.0-84.1  Q1:33.6-50.4  Q2:50.4-52.6  Q3:52.6-54.4  Q4:54.4-56.6  Q5:56.6-83.9 | glucose  glucose | 1  0.99(0.89-1.12)  1.01(0.90-1.14)  1.04(0.93-1.17)  **1.16(1.04-1.30)**  1  0.94(0.80-1.12)  1.06(0.90-1.25)  1.08(0.91-1.27)  **1.16(0.98-1.37)** | Age, race, education, marital status, BMI, family history of cancer, physical activity, smoking, alcohol consumption, total energy intake  Age, race, education, marital status, BMI, family history of cancer, physical activity, smoking, alcohol consumption, total energy intake, and menopausal hormone therapy use |
| Kabat, 2008 | Colorectal Cancer | Women | Q1:<49.4  Q2:49.4-51.6 Q3:51.6-53.3  Q4:53.3-55.4  Q5:>55.4 | glucose | 1  1.04(0.87-1.24)  1.06(0.89-1.27)  1.09(0.91-1.30)  **1.10(0.92-1.32)** | age, education, smoking, BMI, height, hormone replacement therapy, history of diabetes, family history of colorectal cancer, physical activity, , and intakes of total fiber, energy, and dietary calcium. |
| Weijenberg, 2008(1)  Weijenberg, 2008(2) | Colorectal Cancer  Colorectal Cancer | Men  Women | Q1:56.6  Q2:59.1  Q3:60.6  Q4:62.2  Q5:64.5  Q1:53.7  Q2:56.2  Q3:57.8  Q4:59.6  Q5:61.9 | glucose  glucose | 1  0.93(0.73-1.19)  1.00(0.78-1.28)  0.98(0.75-1.29)  **0.81(0.61-1.08)**  1  1.18(0.89-1.56)  1.32(0.98-1.76)  1.08(0.80-1.47)  **1.20(0.85-1.67)** | age, BMI, family history of colon cancer, smoking, total energy intake, intake of calcium, intake of alcohol, educational level, intake of processed meat, physical activity.  age, BMI, family history of colon cancer, smoking, total energy intake, intake of calcium, intake of alcohol, educational level, intake of processed meat, physical activity. |
| Strayer, 2007 | Colorectal Cancer | Women | Q1:42.8  Q2:46.8  Q3:49.0  Q4:51.2  Q5:55.0 | glucose | 1  0.73(0.55-0.96)  0.74(0.56-0.97)  0.92(0.71-1.20)  **0.88(0.67-1.15)** | age, dietary calories, NSAIDS use, smoking, menopausal female hormone use, screened for colorectal cancer, BMI, and calcium intake |
| Larsson, 2006 | Colorectal Cancer | Women | Q1:<75.8  Q2:75.8-78.3  Q3:78.4-80.6  Q4:80.7-83.3  Q5:>83.3 | glucose | 1  0.96(0.76-1.22)  0.92(0.72-1.17)  0.87(0.67-1.13)  **1.00(0.75-1.33)** | education, BMI, total energy  intake, and quartiles of intakes of alcohol, cereal fiber, folate, calcium, magnesium, and red meat. |
| McCarl, 2006 | Colorectal Cancer | Women | Q1:<81.0  Q2:81.0-84.1  Q3:84.2-86.5  Q4:86.6-89.3  Q5:>89.3 | glucose | 1  0.86(0.69-1.06)  1.03(0.84-1.26)  1.04(0.84-1.27)  **1.08(0.88-1.32)** | age, energy, activity level, multivitamin use, diabetes, smoking, BMI, and waist/hip ratio |
| Michaud, 2005(1)  Michaud, 2005(2) | Colorectal Cancer  Colorectal Cancer | Men  Women | Q1:69  Q2:74  Q3:76  Q4:78  Q5:82  Q1:65  Q2:71  Q3:74  Q4:77  Q5:81 | white bread  white bread | 1  1.06(N/A)  1.09(N/A)  1.08(N/A)  **1.14(0.88-1.48)**  1  0.84(N/A)  1.02(N/A)  1.00(N/A)  **1.08(0.87-1.34)** | age, family history of colon cancer, prior endoscopy screening, aspirin use, height, BMI, smoking, physical activity, and intakes of cereal fiber, alcohol, calcium, folate, processed meat and beef, pork or lamb as main dish.  age, family history of colon cancer, prior endoscopy screening, aspirin use, height, BMI, smoking, physical activity, and intakes of cereal fiber, alcohol, calcium, folate, processed meat and beef, pork or lamb as main dish. |
| Higginbotham, 2004 | Colorectal Cancer | Women | Q1:49  Q2:51  Q3:53  Q4:54  Q5:57 | glucose | 1  1.59(0.95-2.67)  1.24(0.71-2.16)  1.93(1.15-3.24)  **1.71(0.98-2.98)** | age, BMI, history of oral contraceptive use, postmenopausal hormone use, family history of colorectal cancer, smoking, alcohol use, physical activity, NSAIDs use, total energy intake, energy-adjusted total fiber/ total fat/ folate/ calcium,/ vitamin D intake. |
| Sieri, 2017 | Liver  cancer | M and W | Q1:50.0  Q2:N/A  Q3: N/A  Q4: N/A  Q5: 57.4 | glucose | 1  0.75(0.36-1.58)  1.17(0.60-2.28)  1.06(0.62-1.83)  **0.85(0.48-1.52)** | sex, education, smoking status, BMI, alcohol intake, fibre intake, saturated fat intake, non-alcohol energy intake and physical activity |
| Fedirko, 2013(1)  Fedirko, 2013(2) | HCC  BTC | M and W  M and W | Q1:51.6  Q2:55.1  Q3:57.4  Q4:60.9  Q1:51.6  Q2:55.1  Q3:57.4  Q4:60.9 | glucose  glucose | 1  0.95(0.64-1.42)  0.90(0.59-1.36)  **1.09(0.71-1.66)**  1  0.78(0.53-1.15)  1.29(0.91-1.84)  **1.06(0.71-1.57)** | Sex, center total energy intake, physical activity, education, BMI, smoking status, DM and alcohol intake,  Sex, center total energy intake, physical activity, education, BMI, smoking status, DM and alcohol intake, |
| Vogtmann, 2013(1)  Vogtmann, 2013(2) | Liver cancer  Liver cancer | Men  Women | Q1:64.4  Q2:69.0  Q3:71.7  Q4:74.2  Q5:77.2  Q1:63.9  Q2:68.5  Q3:71.2  Q4:73.6  Q5:76.8 | glucose  glucose | 1  0.99(0.66-1.50)  0.90(0.59-1.37)  0.72(0.46-1.12)  **0.89(0.58-1.37)**  1  1.93(0.94-3.96)  2.85(1.45-5.61)  2.06(1.02-4.15)  **2.17(1.08-4.35)** | age, education, income, smoking status, alcohol consumption, menopausal status (women only), family history of liver cancer, BMI,  physical activity, total energy intake, and history of diabetes and hepatitis/ chronic liver disease  age, education, income, smoking status, alcohol consumption, family history of liver cancer, BMI,  physical activity, total energy intake, and history of diabetes and hepatitis/ chronic liver disease |
| George, 2009(1)  George, 2009(2) | Liver  Cancer  Liver Cancer | Men  Women | Q1:33.5-51.3  Q2:51.3-53.3  Q3:53.3-55.0  Q4:55.0-57.0  Q5:57.0-84.1  Q1:33.6-50.4  Q2:50.4-52.6  Q3:52.6-54.4  Q4:54.4-56.6  Q5:56.6-83.9 | glucose  glucose | 1  1.73(1.13-2.63)  1.24(0.79-1.95)  1.17(0.74-1.85)  **1.62(1.05-2.48)**  1  1.91(0.95-3.87)  1.23(0.57-2.64)  0.62(0.25-1.52)  **0.95(0.43-2.10)** | Age, race, education, marital status, BMI, family history of cancer, physical activity, smoking, alcohol consumption, total energy intake  Age, race, education, marital status, BMI, family history of cancer, physical activity, smoking, alcohol consumption, total energy intake, and menopausal hormone therapy use |
| Sieri, 2017 | Pancreatic  cancer | M and W | Q1:50.0  Q2:N/A  Q3: N/A  Q4: N/A  Q5: 57.4 | glucose | 1  0.84(0.48-1.46)  0.70(0.38-1.25)  1.06(0.62-1.83)  **0.85(0.48-1.52)** | sex, education, smoking status, BMI, alcohol intake, fibre intake, saturated fat intake, non-alcohol energy intake and physical activity |
| Meinhold, 2010 | Pancreatic  cancer | M and W | Q1:<50.9  Q2:50.9-52.8  Q3:52.8-54.4  Q4:54.4-56.2  Q5:>56.2 | N/A | 1  0.77(0.50-1.18)  0.86(0.57-1.30)  0.92(0.61-1.37)  **1.02(0.69-1.51)** | sex, total energy, cigarette smoking status, and BMI |
| Simon, 2010 | Pancreatic  cancer | Women | Q1:48  Q2:51  Q3:54  Q4:56 | glucose | 1  1.26(0.89-1.77)  0.94(0.65-1.37)  **1.13(0.78-1.63)** | age, race, income, BMI, physical activity, history of diabetes, alcohol use, and smoking status. |
| George, 2009(1)  George, 2009(2) | Pancreatic  Cancer  Pancreatic  Cancer | Men  Women | Q1:33.5-51.3  Q2:51.3-53.3  Q3:53.3-55.0  Q4:55.0-57.0  Q5:57.0-84.1  Q1:33.6-50.4  Q2:50.4-52.6  Q3:52.6-54.4  Q4:54.4-56.6  Q5:56.6-83.9 | glucose  glucose | 1  0.97(0.74-1.27)  1.19(0.93-1.54)  1.05(0.81-1.37)  **1.19(0.92-1.55)**  1  0.90(0.64-1.27)  1.04(0.75-1.44)  0.90(0.64-1.26)  **1.00(0.71-1.40)** | Age, race, education, marital status, BMI, family history of cancer, physical activity, smoking, alcohol consumption, total energy intake  Age, race, education, marital status, BMI, family history of cancer, physical activity, smoking, alcohol consumption, total energy intake, and menopausal hormone therapy use |
| Heinen, 2008 | Pancreatic  cancer | M and W | Q1:55  Q2:57  Q3:59  Q4:61  Q5:64 | glucose | 1  0.78(0.54-1.12)  1.02(0.72-1.46)  0.94(0.64-1.36)  **0.87(0.59-1.29)** | sex, age, energy intake, smoking, alcohol, history of diabetes mellitus, history of hypertension, BMI, and intake of vegetables, fruit, and fiber. |
| Patel, 2007(1)  Patel, 2007(2) | Pancreatic  Cancer  Pancreatic  cancer | Men  Women | Q1:<69.6  Q2:69.6-74.0  Q3:74.0-77.6  Q4:77.6-81.8  Q5:>81.8  Q1:<68.4  Q2:68.4-72.3  Q3:72.3-75.8  Q4:75.8-80.0  Q5:>80.0 | glucose  glucose | 1  0.81(0.55-1.20)  0.69(0.46-1.05)  0.67(0.44-1.01)  **0.80(0.53-1.20)**  1  0.69(0.43-1.14)  1.26(0.83-1.92)  0.79(0.49-1.27)  **1.11(0.71-1.74)** | age, sex, race, BMI, history of gallstones, smoking, total energy intake, family history of pancreatic cancer, location of weight gain, and sedentary behavior  age, sex, race, BMI, history of gallstones, smoking, total energy intake, family history of pancreatic cancer, location of weight gain, and sedentary behavior |
| Johnson, 2005 | Pancreatic  cancer | Women | Q1:<82  Q2:82-85  Q3:85-89  Q4:>89 | N/A | 1  0.71(0.47-1.08)  0.64(0.41-0.99)  **1.08(0.74-1.58)** | age, smoking, diabetes, and multivitamin use. |
| Silvera, 2005 | Pancreatic  cancer | M and W | Q1:<63  Q2:63-73  Q3:74-92  Q4:>92 | glucose | 1  1.29(0.67-2.47)  1.31(0.60-2.83)  **1.43(0.56-3.65)** | age, BMI, alcohol, smoking, parity, energy intake, study center, and randomization group |
| **Case control studies** | | | | | | |
| Li, 2017 | Esophageal Cancer | M and W | Q1:N/A  Q2:N/A  Q3:N/A  Q4:N/A  Q5:N/A | N/A | 1  1.29(0.92-1.81)  1.31(0.93-1.84)  1.09(0.77-1.55)  **1.58(1.13-2.21)** | age, sex, race, study indicator, BMI, fruits and vegetables intake, cigarette smoking |
| Lahmann,2014(1)  Lahmann,2014(2) | EAC  ESCC | M and W  M and W | Q1:46  Q2:50  Q3:53  Q4:57  Q1:46  Q2:50  Q3:53  Q4:57 | glucose  glucose | 1  0.89(0.59-1.36)  0.91(0.61-1.37)  **0.82(0.54-1.26)**  1  0.66(0.41-1.05)  1.01(0.66-1.56)  **0.73(0.46-1.14)** | age, sex, education, BMI, smoking, physical activity, alcohol intake, acid reflux symptoms, NSAIDs use, presence of diabetes, total fruit intake (except for fiber intake), red meat, processed meat, and total energy.  age, sex, education, BMI, smoking, physical activity, alcohol intake, acid reflux symptoms, NSAIDs use, presence of diabetes, total fruit intake (except for fiber intake), red meat, processed meat, and total energy. |
| Eslamian,2013 | Esophageal Cancer | M and W | T1:N/A  T2: N/A  T3: N/A | glucose | 1  1.74(1.35-2.91)  **2.95(1.68-3.35)** | age, sex, GERD symptoms, BMI, smoking status, physical activity, food and beverage temperature, and fruit and vegetable consumption. |
| Li, 2017 | Gastric  Cancer | M and W | Q1:N/A  Q2:N/A  Q3:N/A  Q4:N/A  Q5:N/A | N/A | 1  0.98(0.71-1.36)  1.17(0.85-1.61)  1.28(0.94-1.75)  **1.21(0.88-1.67)** | age, sex, race, study indicator, BMI, fruits and vegetables intake, cigarette smoking |
| Hu, 2013 | Gastric  Cancer | M and W | Q1:<78.1  Q2:78.1-81.9  Q3:81.9-86.0  Q4:>86.0 | white bread | 1  1.22(1.00-1.49)  1.07(0.88-1.31)  **0.90(0.74-1.11)** | age, province, education, BMI, alcohol consumption, smoking and energy intake |
| Bertuccio,2009 | Gastric  Cancer | M and W | Q1:73  Q2:77  Q3:80  Q4:83  Q5:>83 | glucose | 1  1.50(0.90-2.70)  1.50(0.80-2.60)  1.50(0.80-2.60)  **2.10(1.20-3.60)** | age, sex, period of interview, education, BMI, tobacco smoking, intake of fruits and vegetables, and family history of stomach cancer |
| Lazarević,2009 | Gastric  Cancer | M and W | T1: N/A  T2: N/A  T3: N/A | glucose | 1  1.14(0.47-2.76)  **0.39(0.14-1.15)** | age, sex, residence, education, physical activity, total energy intake, meals regularity, rapid eating, overeating at each meal, and history of cancer in the first degree |
| Augustin, 2004 | Gastric  Cancer | M and W | Q1:N/A  Q2:N/A  Q3:N/A  Q4:N/A | glucose | 1  1.25(0.97-1.61)  1.14(0.89-1.47)  **1.06(0.82-1.38)** | age, sex, education, area of residence, diabetes, BMI, smoking, alcohol, intake of fruit and vegetables, and non-carbohydrate energy intake. |
| Huang, 2018 | Colorectal Cancer | M and W | Q1:61.8  Q2: 65.9  Q3: 68.4  Q4: 71.4 | glucose | 1  1.73(1.38-2.16)  2.10(1.69-2.61)  **3.10(2.51-3.85)** | age, sex, marital status, residence, education, occupation, income level, smoking, alcohol drinking, family history of cancer, physical activity. |
| Hu, 2013 | Colorectal Cancer | M and W | Q1:<78.1  Q2:78.1-81.9  Q3:81.9-86.0  Q4:>86.0 | white bread | 1  1.33(1.14-1.55)  1.26(1.08-1.47)  **1.05(0.90-1.24)** | age, province, education, BMI, alcohol consumption, smoking and energy intake |
| Hu, 2013 | Liver  Cancer | M and W | Q1:<78.1  Q2:78.1-81.9  Q3:81.9-86.0  Q4:>86.0 | white bread | 1  0.77(0.54-1.09)  0.80(0.56-1.13)  **0.71(0.49-1.01)** | age, province, education, BMI, alcohol consumption, smoking and energy intake |
| Hu, 2013 | Pancreatic  Cancer | M and W | Q1:<78.1  Q2:78.1-81.9  Q3:81.9-86.0  Q4:>86.0 | white bread | 1  1.28(0.99-1.65)  1.11(0.86-1.44)  **1.09(0.84-1.42)** | age, province, education, BMI, alcohol consumption, smoking and energy intake |
| Rossi, 2010 | Pancreatic  Cancer | M and W | T1: N/A  T2: N/A  T3: N/A | white bread | 1  1.56(1.06-2.30)  **1.78(1.20-2.62)** | age, sex, center, year of interview, education, tobacco smoking, history of diabetes, BMI, and total energy intake |

M: men; W: Women; GI: glycemic index; GERD: gastro-esophageal reflux disease; EAC: esophageal adenocarcinoma; ESCC: esophageal squamous cell carcinoma; BMI: body mass index; NSAID: non-steroidal anti-inflammatory drug; GCA: gastric cardia adenocarcinoma; NCGC: Noncardia gastric cancer; CC: colon cancer; RC: rectal cancer; HCC: hepatocellular carcinoma; IBDC: intrahepatic bile duct carcinoma; DHQ: diet history questionnaire; NCI: the National Cancer Institute; DQ: dietary questionnaire; SES: socio-economic status. Q: quartile or quintile; T: tertile

Supplementary Table 3. Extracted data of studies on glycemic load and the risk of digestive system cancers

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Study | Types of cancer | Gender | Exposure level | Reference  food | RR/HR/OR | Controlled factors | |
| **Cohort studies** | | | | | | | |
| George, 2009(1)  George, 2009(2) | Esophageal Cancer  Esophageal Cancer | Men  Women | Q1:7.1 -53.2  Q2:53.2-106.3  Q3:106.3-130.1  Q4:130.1-164.4  Q5:164.4-740.2  Q1:4.6-66.9  Q2:66.9-86.2  Q3:86.2-106.2  Q4:106.2-135.3  Q5:135.3-583.7 | glucose  glucose | 1  0.93(0.67-1.29)  0.80(0.55-1.16)  0.88(0.58-1.33)  **0.65(0.38-1.11)**  1  0.92(0.40-2.13)  2.01(0.85-4.73)  1.75(0.61-4.98)  **2.18(0.57-8.32)** | | Age, race, education, marital status, BMI, family history of cancer, physical activity, smoking, alcohol consumption, total energy intake  Age, race, education, marital status, BMI, family history of cancer, physical activity, smoking, alcohol consumption, total energy intake, and menopausal hormone therapy use |
| Sieri, 2017 | Gastric cancer | M and W | Q1:86.0  Q2:N/A  Q3: N/A  Q4: N/A  Q5: 235.2 | glucose | 1  0.88(0.52-1.49)  0.86(0.50-1.50)  0.64(0.34-1.21)  **0.55(0.26-1.16)** | | sex, education, smoking status, BMI, alcohol intake, fibre intake, saturated fat intake, non-alcohol energy intake and physical activity |
| Larsson, 2006 | Gastric cancer | Women | Q1:157  Q2:167  Q3:179  Q4:190  Q5:207 | glucose | 1  0.98(0.61-1.55)  0.53(0.31-0.91)  0.75(0.45-1.23)  **0.76(0.46-1.25)** | | age, education, BMI and intakes of total energy and alcohol. |
| Makarem,2017 | Colorectal Cancer | M and W | T1:N/A  T2:N/A  T3:N/A | glucose | 1  1.19(0.61-2.30)  **1.21(0.43-3.40)** | | age, sex, smoking, alcohol, energy, red and processed meat intake and fibre intake |
| Abe, 2016(1)  Abe, 2016(2) | Colorectal Cancer  Colorectal Cancer | Men  Women | Q1:151.9  Q2:167.3  Q3:171.0  Q4:179.0  Q1:138.6  Q2:151.4  Q3:149.9  Q4:150.0 | glucose  glucose | 1  0.93(0.77-1.32)  0.92(0.73-1.15)  **0.79(0.58-1.08)**  1  1.13(0.88-1.44)  1.07(0.80-1.44)  **0.82(0.55-1.24)** | | age, area, alcohol consumption, smoking status, BMI, quartile of metabolic equivalent tasks, DM, colorectal screening, intakes quartile of energy-adjusted calcium, magnesium, vitamin B6, vitamin B12, folate, vitamin D, n-3 polyunsaturated fatty acids, fiber, and red meat  age, area, alcohol consumption, smoking status, BMI, quartile of metabolic equivalent tasks, DM, colorectal screening, menopausal status, use of exogenous female hormones, intakes quartile of energy-adjusted calcium, magnesium, vitamin B6, vitamin B12, folate, vitamin D, n-3 polyunsaturated fatty acids, fiber, and red meat |
| Sieri, 2014 | Colorectal Cancer | M and W | Q1:125  Q2:130  Q3:146  Q4:191 | glucose | 1  1.37(1.01-1.84)  1.27(0.90-1.79)  **1.43(0.94-2.18)** | | sex, education, smoking status, BMI, alcohol intake, calcium intake, folate intake, fibre intake, saturated fat intake, nonalcohol energy and physical activity. |
| Li, 2011 | Colorectal Cancer | Women | Q1:159.7  Q2:179.6  Q3:192.7  Q4:205.9  Q5:225.9 | glucose | 1  0.74(0.55-1.00)  0.69(0.51-0.93)  0.71(0.53-0.96)  **0.94(0.71-1.24)** | | age, education, income, BMI, physical activity, family history of colorectal cancer, total energy intake, and hormone therapy use. |
| George, 2009(1)  George, 2009(2) | Colorectal Cancer  Colorectal Cancer | Men  Women | Q1:7.1 -53.2  Q2:53.2-106.3  Q3:106.3-130.1  Q4:130.1-164.4  Q5:164.4-740.2  Q1:4.6-66.9  Q2:66.9-86.2  Q3:86.2-106.2  Q4:106.2-135.3  Q5:135.3-583.7 | glucose  glucose | 1  0.93(0.83-1.06)  0.88(0.77-1.01)  0.87(0.74-1.02)  **0.88(0.72-1.08)**  1  0.92(0.77-1.10)  0.92(0.75-1.13)  0.81(0.64-1.03)  **0.87(0.64-1.18)** | | Age, race, education, marital status, BMI, family history of cancer, physical activity, smoking, alcohol consumption, total energy intake  Age, race, education, marital status, BMI, family history of cancer, physical activity, smoking, alcohol consumption, total energy intake, and menopausal hormone therapy use |
| Howarth,  2008(1)  Howarth,  2008(2) | Colorectal Cancer  Colorectal Cancer | Men  Women | Q1:97  Q2:127  Q3:148  Q4:169  Q5:209  Q1:82  Q2:109  Q3:125  Q4:141  Q5:171 | glucose  glucose | 1  1.00(0.82-1.24)  1.17(0.94-1.45)  1.16(0.92-1.46)  **1.15(0.89-1.48)**  1  0.98(0.79-1.21)  1.05(0.85-1.31)  0.85(0.67-1.08)  **0.75(0.57-0.97)** | | age, ethnicity, time since cohort entry, family history of colorectal cancer, history of colorectal polyp, cigarette smoking, BMI, hours of vigorous activity, NSAID use, multivitamin use, energy intake, alcohol, red meat, folate, vitamin D, calcium, and dietary fiber intakes  age, ethnicity, time since cohort entry, family history of colorectal cancer, history of colorectal polyp, cigarette smoking, BMI, hours of vigorous activity, NSAID use, multivitamin use, energy intake, replacement hormone use, alcohol, red meat, folate, vitamin D, calcium, and dietary fiber intakes |
| Kabat, 2008 | Colorectal Cancer | Women | Q1:<62.4  Q2:62.4-81.9 Q3:81.9-100.7  Q4:100.7-126.6  Q5:>126.6 | glucose | 1  0.94(0.79-1.12)  1.07(0.88-1.29)  1.01(0.81-1.27)  **1.11(0.82-1.49)** | | age, education, smoking, BMI, height, hormone replacement therapy, history of diabetes, family history of colorectal cancer, physical activity, , and intakes of total fiber, energy, and dietary calcium. |
| Weijenberg, 2008(1)  Weijenberg, 2008(2) | Colorectal Cancer  Colorectal Cancer | Men  Women | Q1:108.7  Q2:124.8  Q3:136.2  Q4:147.8  Q5:165.4  Q1:82.5  Q2:94.0  Q3:101.7  Q4:107.9  Q5:123.6 | glucose  glucose | 1  0.82(0.64-1.04)  0.75(0.58-0.97)  0.90(0.70-1.16)  **0.83(0.64-1.08)**  1  0.96(0.73-1.28)  1.02(0.77-1.37)  1.05(0.78-1.41)  **1.00(0.73-1.36)** | | age, BMI, family history of colon cancer, smoking, total energy intake, intake of calcium, intake of alcohol, educational level, intake of processed meat, physical activity.  age, BMI, family history of colon cancer, smoking, total energy intake, intake of calcium, intake of alcohol, educational level, intake of processed meat, physical activity. |
| Strayer, 2007 | Colorectal Cancer | Women | Q1:46.5  Q2:59.8  Q3:67.4  Q4:74.9  Q5:89.4 | glucose | 1  0.93(0.70-1.22)  0.80(0.60-1.07)  0.81(0.61-1.08)  **0.92(0.70-1.20)** | | age, dietary calories, NSAIDS use, smoking, menopausal female hormone use, screened for colorectal cancer, BMI, and calcium intake |
| Larsson, 2006 | Colorectal Cancer | Women | Q1:<164  Q2:164-175  Q3:176-186  Q4:187-199  Q5:>199 | glucose | 1  0.98(0.78-1.24)  0.85(0.67-1.09)  0.89(0.69-1.14)  **1.06(0.81-1.39)** | | education, BMI, total energy  intake, and quartiles of intakes of alcohol, cereal fiber, folate, calcium, magnesium, and red meat. |
| McCarl, 2006 | Colorectal Cancer | Women | Q1:<146  Q2:147-163  Q3:164-176  Q4:177-192  Q5:>192 |  | 1  1.05(0.85-1.30)  1.04(0.84-1.29)  1.12(0.91-1.38)  **1.09(0.88-1.35)** | | age, energy, activity level, multivitamin use, diabetes, smoking, BMI, and waist/hip ratio |
| Michaud, 2005(1)  Michaud, 2005(2) | Colorectal Cancer  Colorectal Cancer | Men  Women | Q1:131  Q2:158  Q3:177  Q4:195  Q5:223  Q1:80  Q2:103  Q3:119  Q4:137  Q5:167 | white bread  white bread | 1  1.13(N/A)  1.36(N/A)  1.36(N/A)  **1.32(0.98-1.79)**  1  1.03(N/A)  1.10(N/A)  0.91(N/A)  **0.89(0.71-1.11)** | | age, family history of colon cancer, prior endoscopy screening, aspirin use, height, BMI, smoking, physical activity, and intakes of cereal fiber, alcohol, calcium, folate, processed meat and beef, pork or lamb as main dish.  age, family history of colon cancer, prior endoscopy screening, aspirin use, height, BMI, smoking, physical activity, and intakes of cereal fiber, alcohol, calcium, folate, processed meat and beef, pork or lamb as main dish. |
| Higginbotham, 2004 | Colorectal Cancer | Women | Q1:92  Q2:106  Q3:117  Q4:127  Q5:143 |  | 1  1.34(0.76-2.34)  1.81(1.02-3.21)  1.63(0.86-3.09)  **2.85(1.40-5.80)** | | age, BMI, history of oral contraceptive use, postmenopausal hormone use, family history of colorectal cancer, smoking, alcohol use, physical activity, NSAIDs use, total energy intake, energy-adjusted total fiber/ total fat/ folate/ calcium,/ vitamin D intake. |
| Terry, 2003 | Colorectal Cancer | Women | Q1:<99  Q2:99-125  Q3:125-150  Q4:150-185  Q5:>185 |  | 1  1.07(0.82-1.39)  0.91(0.68-1.22)  0.86(0.63-1.17)  **1.05(0.73-1.53)** | | age, intake of energy, study center, treatment allocation, BMI, cigarette smoking, education, physical activity, oral contraceptive use, hormone replacement therapy, parity, and quartiles of alcohol, red meat, and folic acid. |
| Sieri, 2017 | Liver  cancer | M and W | Q1:86.0  Q2:N/A  Q3: N/A  Q4: N/A  Q5: 235.2 | glucose | 1  0.48(0.19-1.21)  0.82(0.35-1.94)  1.46(0.63-3.41)  **1.50(0.54-4.16)** | | sex, education, smoking status, BMI, alcohol intake, fibre intake, saturated fat intake, non-alcohol energy intake and physical activity |
| Fedirko, 2013(1)  Fedirko, 2013(2) | HCC  BTC | M and W  M and W | Q1:101.6  Q2:124.5  Q3:139.9  Q4:168.5  Q1:101.6  Q2:124.5  Q3:139.9  Q4:168.5 | glucose  glucose | 1  1.15(0.76-1.74)  1.03(0.64-1.64)  **1.19(0.72-1.97)**  1  0.99(0.67-1.48)  1.20(0.80-1.79)  **1.08(0.69-1.69)** | | Sex, center total energy intake, physical activity, education, BMI, smoking status, DM and alcohol intake,  Sex, center total energy intake, physical activity, education, BMI, smoking status, DM and alcohol intake, |
| Vogtmann, 2013(1)  Vogtmann, 2013(2) | Liver cancer  Liver cancer | Men  Women | Q1:194.4  Q2:222.8  Q3:240.7  Q4:258.3  Q5:286.0  Q1:166.3  Q2:190.0  Q3:205.1  Q4:219.3  Q5:241.9 | glucose  glucose | 1  1.28(0.84-1.96)  1.07(0.68-1.66)  0.82(0.51-1.30)  **1.07(0.68-1.67)**  1  0.90(0.50-1.63)  0.97(0.54-1.72)  1.09(0.62-1.90)  **1.02(0.59-1.79)** | | age, education, income, smoking status, alcohol consumption, menopausal status (women only), family history of liver cancer, BMI,  physical activity, total energy intake, and history of diabetes and hepatitis/ chronic liver disease  age, education, income, smoking status, alcohol consumption, family history of liver cancer, BMI,  physical activity, total energy intake, and history of diabetes and hepatitis/ chronic liver disease |
| George, 2009(1)  George, 2009(2) | Liver  Cancer  Liver  Cancer | Men  Women | Q1:7.1 -53.2  Q2:53.2-106.3  Q3:106.3-130.1  Q4:130.1-164.4  Q5:164.4-740.2  Q1:4.6-66.9  Q2:66.9-86.2  Q3:86.2-106.2  Q4:106.2-135.3  Q5:135.3-583.7 | glucose  glucose | 1  0.70(0.46-1.06)  0.50(0.31-0.83)  0.66(0.38-1.12)  **0.47(0.23-0.95)**  1  0.57(0.26-1.26)  0.76(0.33-1.77)  0.37(0.13-1.08)  **0.18(0.04-0.79)** | | Age, race, education, marital status, BMI, family history of cancer, physical activity, smoking, alcohol consumption, total energy intake  Age, race, education, marital status, BMI, family history of cancer, physical activity, smoking, alcohol consumption, total energy intake, and menopausal hormone therapy use |
| Sieri, 2017 | Pancreatic  cancer | M and W | Q1:86.0  Q2:N/A  Q3: N/A  Q4: N/A  Q5: 235.2 | glucose | 1  0.63(0.34-1.15)  0.92(0.51-1.67)  0.74(0.37-1.46)  **0.60(0.26-1.38)** | | sex, education, smoking status, BMI, alcohol intake, fibre intake, saturated fat intake, non-alcohol energy intake and physical activity |
| Meinhold, 2010 | Pancreatic  cancer | M and W | Q1: N/A  Q2: N/A  Q3: N/A  Q4: N/A  Q5: N/A | N/A | 1  0.98(0.63-1.52)  0.94(0.60-1.47)  1.17(0.76-1.80)  **1.49(0.98-2.25)** | | sex, total energy, cigarette smoking status, and BMI |
| Simon, 2010 | Pancreatic  cancer | Women | Q1:105  Q2:121  Q3:133  Q4:150 | glucose | 1  0.77(0.54-1.10)  0.87(0.61-1.24)  **0.80(0.55-1.15)** | | age, race, income, BMI, physical activity, history of diabetes, alcohol use, and smoking status. |
| George, 2009(1)  George, 2009(2) | Pancreatic  Cancer  Pancreatic  Cancer | Men  Women | Q1:7.1 -53.2  Q2:53.2-106.3  Q3:106.3-130.1  Q4:130.1-164.4  Q5:164.4-740.2  Q1:4.6-66.9  Q2:66.9-86.2  Q3:86.2-106.2  Q4:106.2-135.3  Q5:135.3-583.7 | glucose  glucose | 1  0.98(0.74-1.29)  0.88(0.64-1.20)  0.95(0.67-1.36)  **0.67(0.42-1.08)**  1  0.81(0.57-1.16)  0.71(0.47-1.08)  0.70(0.43-1.12)  **0.49(0.26-0.94)** | | Age, race, education, marital status, BMI, family history of cancer, physical activity, smoking, alcohol consumption, total energy intake  Age, race, education, marital status, BMI, family history of cancer, physical activity, smoking, alcohol consumption, total energy intake, and menopausal hormone therapy use |
| Heinen, 2008 | Pancreatic  cancer | M and W | Q1:88  Q2:98  Q3:106  Q4:115  Q5:156 | glucose | 1  0.93(0.66-1.31)  0.83(0.58-1.18)  0.99(0.69-1.41)  **0.85(0.58-1.24)** | | sex, age, energy intake, smoking, alcohol, history of diabetes mellitus, history of hypertension, BMI, and intake of vegetables, fruit, and fiber. |
| Nöthlings, 2007 | Pancreatic  cancer | M and W | Q1:78.3  Q2:124.3  Q3:169.5  Q4:271.9 | N/A | 1  1.24(0.94-1.64)  1.14(0.85-1.53)  **1.10(0.80-1.52)** | | race, age, smoking status, family history of pancreatic cancer, energy intake, intakes of red meat and processed meat, and BMI. |
| Patel, 2007(1)  Patel, 2007(2) | Pancreatic  Cancer  Pancreatic  cancer | Men  Women | Q1:<119.0  Q2:119.0-136.5  Q3:136.5-151.5  Q4:151.5-169.9  Q5:>169.9  Q1:<95.1  Q2:95.1-107.8  Q3:107.8-118.9  Q4:118.9-132.3  Q5:>132.3 | glucose  glucose | 1  0.99(0.66-1.48)  0.60(0.38-0.96)  0.89(0.59-1.35)  **1.10(0.73-1.64)**  1  0.95(0.61-1.47)  0.81(0.51-1.28)  0.84(0.53-1.34)  **0.89(0.56-1.41)** | | age, sex, race, BMI, history of gallstones, smoking, total energy intake, family history of pancreatic cancer, location of weight gain, and sedentary behavior  age, sex, race, BMI, history of gallstones, smoking, total energy intake, family history of pancreatic cancer, location of weight gain, and sedentary behavior |
| Johnson, 2005 | Pancreatic  cancer | Women | Q1:<151  Q2:151-169  Q3:170-188  Q4:>188 | N/A | 1  1.09(0.73-1.62)  0.96(0.63-1.45)  **0.87(0.56-1.34)** | | age, smoking, diabetes, and multivitamin use. |
| Silvera, 2005 | Pancreatic  cancer | M and W | Q1:<125  Q2:125-147  Q3:148-169  Q4:>169 | glucose | 1  0.95(0.56-1.61)  0.88(0.51-1.51)  **0.80(0.45-1.41)** | | age, BMI, alcohol, smoking, parity, energy intake, study center, and randomization group |
| Michaud, 2002 | Pancreatic  cancer | Women | Q1:80  Q2:103  Q3:119  Q4:137  Q5:167 | glucose | 1  1.46(0.93-2.35)  1.04(0.62-1.74)  1.33(0.82-2.15)  **1.53(0.96-2.45)** | | height, BMI, smoking, history of diabetes mellitus and cholecystectomy, calorie intake, and physical activity. |
| **Case control studies** | | | | | | | |
| Li, 2017 | Esophageal Cancer | M and W | Q1:N/A  Q2:N/A  Q3:N/A  Q4:N/A  Q5:N/A | N/A | 1  0.84(0.59-1.21)  0.85(0.59-1.23)  0.93(0.63-1.36)  **0.81(0.51-1.29)** | | age, sex, race, study indicator, BMI, fruits and vegetables intake, cigarette smoking |
| Lahmann,2014(1)  Lahmann,2014(2) | EAC  ESCC | M and W  M and W | Q1:95  Q2:113  Q3:126  Q4:146  Q1:95  Q2:113  Q3:126  Q4:146 | glucose  glucose | 1  1.03(0.69-1.54)  0.88(0.59-1.31)  **0.73(0.48-1.13)**  1  0.61(0.40-0.92)  0.67(0.44-1.02)  0.52(0.33-0.82)  **0.46(0.28-0.75)** | | age, sex, education, BMI, smoking, physical activity, alcohol intake, acid reflux symptoms, NSAIDs use, presence of diabetes, total fruit intake (except for fiber intake), red meat, processed meat, and total energy.  age, sex, education, BMI, smoking, physical activity, alcohol intake, acid reflux symptoms, NSAIDs use, presence of diabetes, total fruit intake (except for fiber intake), red meat, processed meat, and total energy. |
| Eslamian,2013 | Esophageal Cancer | M and W | T1:N/A  T2: N/A  T3: N/A | glucose | 1  2.81(2.11-3.51)  **3.49(2.98-4.41)** | | age, sex, GERD symptoms, BMI, smoking status, physical activity, food and beverage temperature, and fruit and vegetable consumption. |
| Li, 2017 | Gastric  Cancer | M and W | Q1:N/A  Q2:N/A  Q3:N/A  Q4:N/A  Q5:N/A | N/A | 1  0.80(0.57-1.13)  0.85(0.60-1.21)  1.07(0.75-1.54)  **0.86(0.55-1.35)** | | age, sex, race, study indicator, BMI, fruits and vegetables intake, cigarette smoking |
| Hu, 2013 | Gastric  Cancer | M and W | Q1:<78.1  Q2:78.1-81.9  Q3:81.9-86.0  Q4:>86.0 | white bread | 1  0.88(0.70-1.11)  0.97(0.74-1.26)  **0.93(0.67-1.29)** | | age, province, education, BMI, alcohol consumption, smoking and energy intake |
| Bertuccio,2009 | Gastric  Cancer | M and W | Q1:147  Q2:183  Q3:217  Q4:263  Q5:>263 | glucose | 1  1.40(0.70-2.50)  2.50(1.40-4.50)  2.70(1.50-4.90)  **2.70(1.50-4.80)** | | age, sex, period of interview, education, BMI, tobacco smoking, intake of fruits and vegetables, and family history of stomach cancer |
| Lazarević,2009 | Gastric  Cancer | M and W | T1: N/A  T2: N/A  T3: N/A | glucose | 1  0.89(0.38-2.16)  **1.28(0.44-3.76)** | | age, sex, residence, education, physical activity, total energy intake, meals regularity, rapid eating, overeating at each meal, and history of cancer in the first degree |
| Augustin, 2004 | Gastric  Cancer | M and W | Q1:N/A  Q2:N/A  Q3:N/A  Q4:N/A | glucose | 1  1.44(1.11-1.87)  1.62(1.24-2.12)  **1.94(1.47-2.55)** | | age, sex, education, area of residence, diabetes, BMI, smoking, alcohol, intake of fruit and vegetables, and non-carbohydrate energy intake. |
| Huang, 2018 | Colorectal Cancer | M and W | Q1:121.4  Q2: 162.7  Q3: 184.9  Q4: 211.9 | glucose | 1  0.77(0.63-0.94)  0.96(0.79-1.16)  **1.14(0.94-1.39)** | | age, sex, marital status, residence, education, occupation, income level, smoking, alcohol drinking, family history of cancer, physical activity. |
| Hu, 2013 | Colorectal Cancer | M and W | Q1:<78.1  Q2:78.1-81.9  Q3:81.9-86.0  Q4:>86.0 | white bread | 1  1.15(0.98-1.36)  1.16(0.97-1.38)  **1.28(1.05-1.57)** | | age, province, education, BMI, alcohol consumption, smoking and energy intake |
| Hu, 2013 | Liver  Cancer | M and W | Q1:<78.1  Q2:78.1-81.9  Q3:81.9-86.0  Q4:>86.0 | white bread | 1  0.99(0.68-1.45)  1.06(0.70-1.59)  **1.17(0.75-1.84)** | | age, province, education, BMI, alcohol consumption, smoking and energy intake |
| Lagiou, 2009 | Liver  Cancer | M and W | Q1:177.5  Q2:215.0  Q3:239.5  Q4:277.0  Q5:>277 | white bread | 1  1.34(0.80-2.23)  1.19(0.71-2.01)  1.52(0.92-2.53)  **1.50(0.90-2.50)** | | gender, age, education, tobacco smoking, alcohol consumption and energy intake without alcohol and carbohydrates. |
| Rossi, 2009 | Liver  Cancer | M and W | Q1:158.0  Q2:191.8  Q3:222.9  Q4:264.4  Q5:>264.4 | white bread | 1  1.69(0.85-3.35)  1.91(0.93-3.92)  1.70(0.82-3.50)  **3.02(1.49-6.12)** | | gender, age, study center, education, tobacco smoking, alcohol consumption, and energy intake without alcohol and carbohydrates |
| Hu, 2013 | Pancreatic  Cancer | M and W | Q1:<78.1  Q2:78.1-81.9  Q3:81.9-86.0  Q4:>86.0 | white bread | 1  1.14(0.86-1.49)  1.29(0.97-1.73)  **1.41(1.02-1.95)** | | age, province, education, BMI, alcohol consumption, smoking and energy intake |

M: men; W: Women; GI: glycemic index; GERD: gastro-esophageal reflux disease; EAC: esophageal adenocarcinoma; ESCC: esophageal squamous cell carcinoma; BMI: body mass index; NSAID: non-steroidal anti-inflammatory drug; GCA: gastric cardia adenocarcinoma; NCGC: Noncardia gastric cancer; CC: colon cancer; RC: rectal cancer; HCC: hepatocellular carcinoma; IBDC: intrahepatic bile duct carcinoma; DHQ: diet history questionnaire; NCI: the National Cancer Institute; DQ: dietary questionnaire; SES: socio-economic status; Q: quartile or quintile; T: tertile