|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Supplementary Table Characteristics of the studies included in the meta-analysis** | | | | | | | |
| **First author, publication year, country** | **Study type** | **No. of case patients (outcome)** | **Cohort size and duration of follow-up** | **Type of meat and exposure categories** | **Adjust RR/OR/HR (95%CI)** | **Controlled variables** | **Quality score** |
| Pulkit Taunk1,  2015,  United States | Cohort study | 1417 (895 males, 522 females)  (incidence) | 322846 men and women; 11y | Red and processed meat;  Quintile  (g/1,000 kcal) |  | Age, sex, energy, smoking, BMI, education, race, self-reported diabetes, alcohol use and energy-adjusted saturated fat | 9 |
| Q1  Q2  Q3  Q4  Q5 | **Red meat**  **(combined)**  1.00 (ref.)  1.06 (0.88-1.26)  1.11 (0.92-1.32)  1.18 (0.99-1.42)  1.22 (1.01-1.48) |
| Q1  Q2  Q3  Q4  Q5 | **(men)**  1.00 (ref.)  1.02 (0.81-1.28)  1.14 (0.91-1.44)  1.20 (0.95-1.51)  1.36 (1.07-1.73) |
| Q1  Q2  Q3  Q4  Q5 | **(women)**  1.00 (ref.)  1.11 (0.84-1.47)  1.05 (0.78-1.40)  1.17 (0.87-1.56)  1.01 (0.74-1.38) |
| Q1  Q2  Q3  Q4  Q5 | **Processed**  **(combined)**  1.00 (ref.)  1.29 (1.08-1.53)  1.23 (1.02-1.46)  1.24 (1.04-1.49)  1.02 (0.85-1.24) |
| Q1  Q2  Q3  Q4  Q5 | **(men)**  1.00 (ref.)  1.33 (1.07-1.66)  1.17 (0.93-1.47)  1.26 (1.00-1.58)  1.05 (0.83-1.33) |
| Q1  Q2  Q3  Q4  Q5 | **(women)**  1.00 (ref.)  1.22 (0.91-1.62)  1.33 (1.00-1.76)  1.23 (0.91-1.65)  0.98 (0.72-1.33) |
| Alec J. Beaney2,  2016,  Italy | Cohort study | 1532 (incidence) | 23133 men and women; 17y | Red and processed meat;  Quintiles (g/d) and age |  | Sex, age, diabetes mellitus, smoking, energy, BMI, physical activity, dietary antioxidant intake, cooking methods, plasma | 7 |
|  |  |  |  | Q1: 0 to <8.6  Q2: 8.6 to <23.1  Q3: 23.1 to <36.8  Q4: 36.8 to <55.7  Q5: 55.7-349.3 | **Red**  **(Age<60)**  1.00 (ref)  3.23 (0.65-16.12)  2.13 (0.39-11.73)  4.32 (0.91-20.59)  4.62 (0.96-22.30) |  |  |
|  |  |  |  | Q1: 0 to <8.6  Q2: 8.6 to <23.1  Q3: 23.1 to <36.8  Q4: 36.8 to <55.7  Q5: 55.7-349.3 | **(Age>=60)**  1.00 (ref)  0.51 (0.23-1.12)  0.38 (0.16-0.89)  0.80 (0.41-1.57)  0.24 (0.08-0.67) |  |  |
|  |  |  |  | Q1: 0 to <5.4  Q2: 5.4 to <14.2  Q3: 14.2 to <23.1  Q4: 23.1 to <36.1  Q5: 36.1-192.0 | **Processed**  **(Age<60)**  1.00 (ref)  1.56 (0.35-7.01)  2.64 (0.66-10.62)  3.35 (0.86-13.09)  3.73 (0.95-14.66) |  |  |
|  |  |  |  | Q1: 0 to <5.4  Q2: 5.4 to <14.2  Q3: 14.2 to <23.1  Q4: 23.1 to <36.1  Q5: 36.1-192.0 | **(Age>=60)**  1.00 (ref)  1.21 (0.55-2.68)  0.81 (0.34-1.92)  0.75 (0.31-1.83)  0.90 (0.37-2.17) |  |  |
| Arbor J.L. Quist3, 2018,  United States | Cohort study | 313 (incidence) | 34242 Iowa USA women; 25y | Red meat (g/d) |  | Age, race, PWS chlorinated, surface water, smoking, occupation, residence, BMI, education, diabetes, physical activity, oral contraceptive use, estrogen use, insulin use, diet | 7 |
|  |  |  |  | <45.47  45.47-79.10  79.11-120.17  120.18-198.56  >198.57 | 1.00 (ref)  0.75 (053-1.05)  1.03 (0.73-1.47)  1.00 (0.65-1.50)  1.00 (0.47-1.85) |  |  |
| Marjorie L. McCullough4,  2017,  United States | Cohort study | 1156 (incidence) | 138266 men and women; 15.7y | Red and processed meat;  Quintile (servings/week) |  | Age, race, education, BMI, diabetes, smoking, physical activity, dietary | 9 |
|  |  |  |  | Q1: ≤2.4/1.3  Q2: >2.4/1.3-4.2/2.6  Q3: >4.2/2.6-6.2/3.9  Q4: >6.2/3.9-9.1/5.9  Q5: >9.1/5.9 | **Red and processed meat**  **(combined)**  1.00 (ref)  0.90 (0.75-1.08)  0.84 (0.70-1.02)  0.89 (0.72-1.09)  0.81 (0.64-1.02) |  |  |
|  |  |  |  | Q1: ≤2.4/1.3  Q2: >2.4/1.3-4.2/2.6  Q3: >4.2/2.6-6.2/3.9  Q4: >6.2/3.9-9.1/5.9  Q5: >9.1/5.9 | **(men)**  1.00 (ref)  0.91 (0.71-1.17)  0.81 (0.61-1.06)  0.87 (0.65-1.15)  0.82 (0.58-1.14) |  |  |
|  |  |  |  | Q1: ≤2.4/1.3  Q2: >2.4/1.3-4.2/2.6  Q3: >4.2/2.6-6.2/3.9  Q4: >6.2/3.9-9.1/5.9  Q5: >9.1/5.9 | **(women)**  1.00 (ref)  0.88 (0.68-1.15)  0.89 (0.67-1.17)  0.91 (0.68-1.22)  0.80 (0.57-1.12) |  |  |
|  |  |  |  | Q1: ≤1.4/0.9  Q2: >1.4/0.9-2.3/1.6  Q3: >2.3/1.6-3.5/2.5  Q4: >3.5/2.5-5.2/3.8  Q5: >5.2/3.8 | **Red meat**  **(combined)**  1.00 (ref)  0.84 (0.70-1.00)  0.83 (0.69-1.00)  0.91 (0.75-1.10)  0.82 (0.66-1.02) |  |  |
|  |  |  |  | Q1: ≤1.4/0.9  Q2: >1.4/0.9-2.3/1.6  Q3: >2.3/1.6-3.5/2.5  Q4: >3.5/2.5-5.2/3.8  Q5: >5.2/3.8 | **(men)**  1.00 (ref)  0.77 (0.60-1.00)  0.87 (0.68-1.12)  0.93 (0.72-1.21)  0.87 (0.65-1.18) |  |  |
|  |  |  |  | Q1: ≤1.4/0.9  Q2: >1.4/0.9-2.3/1.6  Q3: >2.3/1.6-3.5/2.5  Q4: >3.5/2.5-5.2/3.8  Q5: >5.2/3.8 | **(women)**  1.00 (ref)  0.90 (0.69-1.16)  0.78 (0.59-1.03)  0.89 (0.67-1.17)  0.84 (0.62-1.15) |  |  |
|  |  |  |  | Q1: ≤0.5/0.1  Q2: >0.5/0.1-1.3/0.6  Q3: >1.3/0.6-2.4/1.2  Q4: >2.4/1.2-4.2/2.2  Q5: >4.2/2.2 | **Processed meat**  **(combined)**  1.00 (ref)  0.91 (0.76-1.09)  0.91 (0.76-1.10)  0.89 (0.73-1.08)  0.82 (0.66-1.02) |  |  |
|  |  |  |  | Q1: ≤0.5/0.1  Q2: >0.5/0.1-1.3/0.6  Q3: >1.3/0.6-2.4/1.2  Q4: >2.4/1.2-4.2/2.2  Q5: >4.2/2.2 | **(men)**  1.00 (ref)  0.88 (0.68-1.13)  0.87 (0.67-1.12)  0.85 (0.64-1.12)  0.78 (0.58-1.06) |  |  |
|  |  |  |  | Q1: ≤0.5/0.1  Q2: >0.5/0.1-1.3/0.6  Q3: >1.3/0.6-2.4/1.2  Q4: >2.4/1.2-4.2/2.2  Q5: >4.2/2.2 | **(women)**  1.00 (ref)  0.94 (0.73-1.22)  0.97 (0.74-1.28)  0.93 (0.70-1.23)  0.86 (0.63-1.17) |  |  |
| Valentina Rosato5,  2018,  Italy | Case-control study (hospital-based) | 688 (incidence) | 2204 men and women; 22y | Processed meat (g/d) |  | Sex, age, study  center, year of interview, education, tobacco smoking, alcohol drinking, body mass index, vegetables consumption, fruit consumption, and total energy intake | 6 |
|  |  |  |  | 10-20 | 1.31 (1.03-1.68) |  |  |
|  |  |  |  | >20 | 1.46 (1.15-1.85) |  |  |
| Jessica L. Petrick6,  2020,  United States | Cohort study | 168 (incidence) | 33151 African American women; 23y | Red and processed meat;  Quartile  (g/day) and frequency  (85g/week) |  | Age, BMI, smoking, alcohol, education, vigorous activity, diabetes, energy | 8 |
|  |  |  |  | Quartile  Q1: 9.0±4.8  Q2: 24.4±4.5  Q3: 42.8±6.7  Q4: 91.0±37.1 | **Total red meat**  1.00 (ref)  0.85 (0.55-1.31)  1.03 (0.67-1.60)  1.19 (0.73-1.92) |  |  |
|  |  |  |  | Frequency |  |  |  |
|  |  |  |  | <1/week  1-3/week  >3/week | 1.00 (ref)  0.65 (0.42-1.01)  0.97 (0.63-1.61) |  |  |
|  |  |  |  | Quartile  Q1: 7.1±4.3  Q2: 18.6±5.6  Q3: 32.3±9.0  Q4: 69.7±34.0 | **Unprocessed red meat**  1.00 (ref)  0.74 (0.48-1.14)  0.96 (0.63-1.46)  1.01 (0.63-1.61) |  |  |
|  |  |  |  | Frequency |  |  |  |
|  |  |  |  | <1/week  1-3/week  >3/week | 1.00 (ref)  0.83 (0.57-1.21)  0.99 (0.64-1.55) |  |  |
|  |  |  |  | Quartile  Q1: 2.1±2.5  Q2: 6.4±5.2  Q3: 11.9±8.6  Q4: 23.9±20.2 | **Processed meat**  1.00 (ref)  0.95 (0.63-1.44)  0.83 (0.54-1.28)  0.79 (0.49-1.25) |  |  |
|  |  |  |  | Frequency |  |  |  |
|  |  |  |  | <1/week  1-3/week  >3/week | 1.00 (ref)  0.99 (0.70-1.39)  0.59 (0.25-1.38) |  |  |
| Brian Z. Huang7,  2021,  United States | Cohort study (MEC) | 1618 (incidence and mortality) | 184542 men and women, 21y | Red meat;  Quartile  (g per 1000 kcal/d) |  | Age, sex, ethnicity, smoking, BMI, diabetes, family history, alcohol, caloris | 8 |
|  |  |  |  | Q1: 0.0-14.1  Q2: 14.1-23.9  Q3: 23.9-35.2  Q4: 35.2-216.5 | 1.00 (ref)  1.25 (1.08-1.43)  1.16 (1.00-1.34)  1.18 (1.02-1.37) |  |  |
| Brian Z. Huang7,  2021,  United States | Cohort study (SCCS) | 266 (incidence and mortality) | 66793 men and women, 14y | Red meat;  Quartile  (g per 1000 kcal/d) |  | Age, sex, ethnicity, smoking, BMI, diabetes, family history, alcohol, caloris | 8 |
|  |  |  |  | Q1: 0.0-26.3  Q2: 26.3-43.3  Q3: 43.3-64.5  Q4: 64.5-428.7 | 1.00 (ref)  0.97 (0.68-1.38)  1.20 (0.85-1.70)  1.31 (0.93-1.86) |  |  |
| Donghui Li8,  2019,  United States | Case-control study | 1321 (incidence) | 1061 men and women, 6y | Doneness |  | Age, race, sex education, diabetes, smoking, alcohol, first-degree relative with cancer, BMI at age of 30 | 8 |
|  |  |  |  | Hamburger or cheeseburger | 1.07 (0.77-1.48) |  |  |
|  |  |  |  | Steak | 1.07 (0.77-1.48) |  |  |
|  |  |  |  | Pork chops | 1.01 (0.80-1.27) |  |  |
|  |  |  |  | Bacon | 1.16 (0.93-1.46) |  |  |

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