**Appendix 1:**  Summary of reviewed literature examining TFA and health outcomes

| Reference & Study type | | Overview | Study Population | | | TFA Assessment | Confounders | Results | | | Conclusions & Notes |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| All-Cause Mortality | | | | | | | | | | | |
| ([Kiage et al., 2013](#_ENREF_17))  Prospective | | **Total TFA**  All-cause mortality & total dietary TFA | ***Country:*** US  REGARDS Cohort  ***N***=18153, 56% F  ***Age:*** mean 65 (≥ 45)y  7y FU  1572 deaths  ***Intake TFA (% E):***  2.97±1.117 | | | ***Dietary assessment:***  Self-administered Block 98 FFQ  ***Outcome dx:*** Social security death index or national death index | Age, sex, smoking status, race, religion, alcohol use, education, WC, PAL, T2D. IHD, HTN, CKD, statin use, TEI, energy adj. SFA, PUFA, MUFA & PRO. | ↓ to ↑ quintile TFA intake; mortality rates per 1000 person yrs FU:  \*\*After adj; HR (95% CI): 1st quintile 1.00, 2nd quintile 1.03 (0.86, 1.23), 3rd quintile 0.98 (0.82,1.17), 4th quintile 1.25 (1.05, 1.48) 5th quintile 1.24 (1.05, 1.48)  Population attributable risk due to TFA intake was 7% (95% CI 5%, 8%) | | | **Intake: +ve assoc. TFA and all-cause mortality**  Association only significant at higher intakes  Data not yet available on all individual causes of death for this cohort |
| CHD | |  |  | | |  |  |  | | |  |
| ([Chiuve et al., 2009](#_ENREF_6))  Prospective | | **Total TFA (18:1 & 18:2)**  Intake of TTFA, trans -18:1 and trans 18:2 & risk of SCD | ***Country***: US  NHS  ***N***=86 762 **F**  ***Age***: 60 y  26y FU  317 SCD events  ***TFA intake (% E):***  Total TFA:1.54  18:1:1.26  18:2:1.09 | | | ***Dietary assessment:***  Self-administered FFQ every 4 y  ***Outcome dx:***  Medical records | Age, TEI, CVD risk factors | No significant association:  ↑ vs ↓ quintile of TFA intake  RR, 95% CI:  Total TFA: 1.28 (0.82, 2.00)  Trans 18:1: 1.08 (0.64, 1.83)  Trans 18:2; 1.19 (0.76, 1.88)  In F:↑ vs ↓ quintile of intake  \*\* Total TFA & SCD with CHD: RR 3.24 (1.42, 7.40) | | | **Intake: No assoc. TTFA or trans 18:1, 18:2 with SCD except for women with CHD.**  **+ve assoc. b/t intake of TFA & SCD in women with CHD** |
| ([Khaw, Friesen, Riboli, Luben, & Wareham, 2012](#_ENREF_16))  Case-control | | **Total TFA**  Plasma phospholipid FA (PFA) conc. & incident CHD | **Country:** UK  EPIC-Norfolk Study  ***N***=7354, 47% F  Cases: 2424 (776 F)  Control: 4930(2684 F)  ***Age:*** 62.4 (40-79) y  12-16y FU  ***TFA conc. (% total)***  Cases: 0.1(0.1)  Control:0.1 (0.1) | | | ***Serum TFA:***  gas chromatography  ***Outcome dx:*** Hospital admission or death from CHD | Age, sex, FA, BMI, PAL, smoking, alcohol, social class, education, plasma Vit. C, diabetes hx, SBP, Chol. | ↑ vs ↓ quintile of intake  Trans PFA: Fully adjusted model;  OR 0.98 (0.91-1.05)p=0.5 | | | **Serum: No assoc. TTFA conc. & CHD**  Only measured 2 tFA:  16:1 n-9 trans & 18:1 n 9 trans. |
| ([Laake et al., 2012](#_ENREF_22))  Prospective | | **PHVO, PHFO & rTFA**  Intake of TFA from PHVO, PHFO, rTFA & risk of death from CVD, CHD, cerebrovascular diseases | | ***Country:*** Norway  NCS  **N**=71 464 (50%M)  ***Age:*** 41 (20-49)y  19-33y FU  Deaths during FU:  3870 CVD  2383 CHD  732 cerebrovascular  ***Mean intake (% E)***:  PHVO: 0.9  PHFO: 1.6  rTFA: 0.6 | | ***Dietary assessment:***  80 item SFFQ (special emphasis on fat sources)  ***Outcome dx:*** death statistics for CVD, CHD, cerebrovascular diseases | Age, TEI, SBP, BMI, smoking, education, SFA, rTFA, TFA, PHVO, PRO, Chol, CHO | | ↑ vs ↓ quintile of intake:  HR (95% CI) – significant assoc were:  TFA from PHVO  CHD : 1·23 (95 % CI 1·00, 1·50)  Cerebrovascular diseases 0·65 (95 % CI 0·45, 0·94)  TFA from PHFO  CVD 1·14 (95 % CI 1·03, 1·26)  Cerebrovascular diseases 1·32 (95 % CI 1·04, 1·69)  rTFA intake  CVD 1·30 (95% CI 1·05, 1·61)  CHD 1·50 (95% CI 1·11, 2·03)  Sudden death 2·73 (95% CI 1·19, 6·25) in women.  These associations with rTFA intake were not significant in men | **Intake: +ve, -ve and neutral associations found** b/t TFA intake from PHVO, PHFO or rTFA and CVD or CHD. | |
| ([Mashal, Oudeh, Al-Ismail, Abu-Hammour, & Al-Domi, 2012](#_ENREF_25))  Case-control | | **Total TFA**  TFA intake & CHD | | ***Country:*** Jordan  ***N***=191, 53% m  Cases=100  Control=91  ***Age*:** 41.9y  ***TFA intake/day %E:***  Total: 0.70±0.03 | | ***Dietary assessment:***  85 item SFFQ adapted to ↑ sensitivity to fat intake.  Database provided by US Dept. Ag  ***Outcome dx:***  Medical records | Age | | Daily TFA intake & CHD risk compared to controls:  \*RR 5.2 (1.0-26.9)  RR CHD for TFA  ↑ vs ↓ quintile of intake  \*4.9 (1.3,17.4) | **Intake: +ve assoc. TFA intake and CHD**  Estimates of intake dubious given the oil stocks are likely to be very different in Jordan vs the US (US database used) | |
| ([Yaemsiri et al., 2012](#_ENREF_46))  Prospective | | **Total TFA**  TFA intake and ischaemic stroke | | ***Country***: US  WHI-OS  ***N***=87025 F  ***Age:*** 63.5±7.3 (50-79y)  663 041 person-y FU with 1049 cases  ***TFA intake by quintile (median g/day):***  Q1: 2.2  Q2: 2.3  Q3: 2.6  Q4: 3.4  Q5: 6.1  Mean of medians: 3.32 | | ***Dietary assessment:***  Repeated & validated dietary assessments  122 item self-administered FFQ  ***Outcome dx:***  Medical charts, brain imaging or death cert reviewed by neurologists. | Age, race, education, family income, smoking status, HRT, total metabolic eq task hrs per week, alcohol, CHD hx, AF hx, T2D hx, aspirin use, antihypertensive medications, statins, BMI, SBP, TEI | | ↑ vs ↓ quintile of intake  \*HR (1.39; 95% CI 1.08-1.79)  Assoc. modified by aspirin use:  \*HR 1.66 (95% CI, 1.21-2.36) non aspirin users  \*HR 0.95 (0.60-1.48) among aspirin users | **Intake: +ve assoc. TFA intake & stroke, moderated by aspirin use**  Women in the highest quintile of intake had a 39% increased incidence of ischaemic stroke than those in the lowest quintile  Non aspirin users-66% increase incidence;  Aspirin may attenuate adverse effects of TFA on ischaemic stroke | |
| Cancer | |  | |  | |  |  | |  |  | |
| ([Laake et al., 2013](#_ENREF_21))  Prospective | | **Ruminant & Industrial separate analyses**  Intake PHVO-TFA, PHFO-TFA, rTFA and cancer risk | | ***Country:*** Norway  NCS  ***N***=77 568, 50.4% m  **Age:** 41.2y  24.8y mean FU  12004 cases dx  ***TFA intake***  **(mean %E, median %E, range %E):**  PHVO: 0.9, 0.7 (0.00-0.62)  PHFO: 6, 1.3 (0.00-11.7)  rTFA: 0.6,0.5 (0-2.0)  Total TFA mean % E:  2.5 | | ***Dietary assessment:***  80 item SFFQ  ***Outcome dx:*** Cancer registry of Norway | Gender, TEI, PAL, smoking, BMI, education level | | HR ↑ vs ↓ intake categories (5 groups, not quintiles) (95% CI); p for trend:  PHVO-TFA:  *Significant -ve trends:*  \*\* all cancers  0.97(0.91, 1.04) p for trend=0.006  \*\*pancreatic cancer in men  0.52 (0.31, 0.87) p for trend=0.007  \*CMM men  0.83(0.53, 1.30) p for trend =0.03  \*non melanoma skin cancer  0.85 (0.55, 1.34) p for trend=0.03  \*\* cancer of CNS women  0.58 (0.32, 1.04) p for trend=0.005  \*NHL  0.70 (0.50,0.98) p for trend=0.04  PHFO-TFA:  *Significant +ve trends:*  \*stomach cancer  1.34 (0.97, 1.85) p for trend=0.01  \*\*multiple myeloma  2.02 (1.24, 3.28) p for trend = 0.003  \*lung cancer in men when analysis restricted to never smokers.  *Significant -ve trends:*  \*\* lung cancer women  0.55 (0.40, 0.77) p for trend= 0.0003  \*\*prostate cancer  0.82 (0.69, 0.96) p for trend=0.002  rTFA:  *Significant -ve trends:*  \*CMM women  0.57 (0.32, 1.02) p for trend =0.04  \*\* multiple myeloma  0.45 (0.24, 0.84) p for trend=0.01  *Significant +ve trends:*  \*\* all cancers  1.09 (1.02,1.16) p for trend=0.002  \*\*mouth & pharynx  1.09 (1.02, 1.16) p for trend=0.006  \*\*NHL  1.47 (1.06, 2.04) p for trend=0.01  \*PM breast cancer  1.17 (0.91,1.49) p=0.03 | **Intake: +ve, -ve and neutral assoc. TFA intake**  PHFO-TFA & rTFA showed more unfavourable results than PHVO-TFA.  Diff assoc. b/n cancer risk and TFA from these sources may be due to diff chemical structures of TFA & potentially different site specific carcinogenic effect. | |
| Breast | |  | |  | |  |  | |  |  | |
| ([Aro et al., 2000](#_ENREF_1))  Case-control | | **CLA,**  **vaccenic acid**  CLA, vaccenic acid intake & BC | | ***Country:*** Finland  ***N=***433 F  Case=225  Control =208  **Age** 52.6 (25-75y)  ***TFA intake: g/day***  C18:1 trans: 1.17 ±0.54  Vaccenic acid: 0.28 ±0.14  CLA: 0.13± 0.06  Total: 0.52 | | ***Dietary assessment:***  110 item validated FFQ completed at home, checked by nurse at interview.  Finnish food comp database  **Serum FA**:  gas liquid chromatography  ***Outcome Dx.:*** Finnish Cancer registry | Age, area, energy. Age at menarche, age at 1st baby, OC, Oestrogen, FHx, BBD, education, alcohol, smoking, PAL, WHR, BMI | | ↑ vs ↓ quintile of intake  Dietary CLA:  PM women OR 0.3 (0.1, 0.7)  Dietary trans-vaccenic acid:  no signif assoc  ↑ vs ↓ quintile of serum FA:  In PM women  Trans-vaccenic acid: OR 0.2 (95% CI 0.1,0.6)  CLA:  OR 0.2 (95% CI 0.1,0.6) | **Serum & Intake: Inv assoc with BC.**  70% reduction with higher intake of CLA  80% reduction in risk seen with higher serum CLA and 80% reduction with higher serum of trans-vaccenic acid.  It is possible to ↑ CLA & trans-vaccenic acid in foods by modifying feeding of ruminants | |
| ([Byrne, Rockett, & Holmes, 2002](#_ENREF_2))  Prospective | | **Total TFA**  TFA intake & BC | | **Country**: US  NHS  ***N=***44697 F  **Age:** 56.8 ± 5.5 (35-55y)  14 y FU  1071 cases  ***TFA intake (mean %E):*** 1.4±0.5 | | ***Dietary assessment:***  FFQ 1980 (61 item) FFQ ’84, ’86, ’90 (131 item)  ***Outcome dx:***  Medical records for all reported dx of BC | Age, Ht., age at menarche, age at menopause, HRT, parity, BMI, Wt change since 18y, FHx. BC, Vit A. | | ↑ vs ↓ quintile of intake:  Total TFA: RR 0.91 (0.73-1.13) p=0.33  No indication that ↑ intake of TFA was assoc. with ↑BC risk. A 1% change in percentage of energy from TFA was associated with a RR of 0.94 (95% CI 0.84-1.06) | **Intake: No assoc. TFA & BC**  Increase in dietary fat incl. TFA was not associated with higher risk of BC among PM women without BBD. | |
| ([Chajes et al., 2008](#_ENREF_4))  Case-control | | **Total TFA, elaidic acid, trans-linoleic acid**  TFA intake, serum & BC. | | ***Country***: France  E3N-EPIC cohort  ***N=***19 934 F  ***Age:*** 56.8 (40-65y)  7y FU  363 BC dx, matched with controls within the study  ***Serum TFA Conc (% Total FA)***  Elaidic acid:  Controls: 0.21  Case:0.22  Trans-linoleic  Controls: 0.07  Cases: 0.07  Palmitoleic acid:  Controls: 0.16  Cases: 0.17 | | ***Serum FA****:*  gas chromatography  ***Outcome dx:*** Examination of medical records by physician on report of BC dx | BMI, alcohol, ht, menopausal hormone use, education level, parity, family Hx of BC | | **↑** risk BC assoc. with:  \*\*↑ serum levels trans-palmitoleic acid (OR=2.24, 95% CI: 1.30, 3.86)  Non-significant trends:  trans elaidic acid (OR=1.45, 95% CI:0.90, 2.33) p=0.12  Trans-linoleic acid (OR=1.55, 95% CI :0.91, 2.63) p=0.10 | **Serum: +ve assoc. serum trans palmitoleic acid & BC**  **No assoc. elaidic acid & BC**  Women with ↑serum levels of trans palmitoleic and elaidic acid had a risk of BC increase by 50% to 2 fold in comparison to those with low serum levels.  Limitations: estimating TFA intake via dietary questionnaires is imprecise | |
| ([Chajès et al., 1999](#_ENREF_3))  Case-Control | | **Elaidic acid**  Elaidic acid intake & BC | | ***Country:*** Sweden  VIP,MONICA & MSP  ***N=***584 F  Cases: 196  Controls: 388  Age: 55 y  ***Serum TFA Conc (% total FA)***  Elaidic Acid:  Case: 0.31  Control: 0.29 | | ***Dietary assessment:***  Individual FA measured as % of TFA capillary gas chromatography  ***Outcome dx***:  Linkage with regional & national cancer registries. | Age at menarche, age at 1st full term pregnancy, number of children, HRT, ht, wt. | | ↑ vs ↓ quartile of FA serum samples:  18:1 n-9 t (elaidic acid)  Adj RR 0.55 (0.2-1.51) p=0.339 | **Serum: no assoc. with BC** | |
| ([Holmes et al., 1999](#_ENREF_14))  Prospective | | **Total TFA**  intakes of FA & BC | | ***Country***: US  NHS  ***N***=88 795 F  ***Age:*** 30-55y  14y FU  2956 BC dx  ***TFA intake:*** not given | | ***Dietary assessment:***  61 item SFFQ 1980,  131 item SFFQ ’84, ’86, 90  ***Outcome dx:***  Medical records, National Death Index | Energy, age, Vit A intake, alcohol, time period, Ht, parity, age 1st birth, Wt change since 18y, BMI, age at menopause, HRT, FHx, BBD, age at menarche | | Data from 1980-94:  MV RR for a 1% ↑ in TFA: 0.92 (0.86-0.98)  Data from 1984 (expanded FFQ):  MV RR TFA 0.87 (0.79-0.95) | **Intake: -ve assoc for TFA intake and BC risk**  Long term averaged diet may not be the best way to express the r’ship b/t diet & BC- latency period | |
| ([Kohlmeier et al., 1997](#_ENREF_20))  Case-control | | **Total TFA**  Serum TFA & PM BC | | **Country:** Switzerland, Spain, Ireland, Germany, Netherlands  EURAMIC  ***N=***616 F  Cases:209  Controls:407  Age: 62 (50-74)y  ***TFA mean serum levels (%FA ±SD):***  1.11±0.64 | | ***Adipose tissue:***  Concentrations of TFA in gluteal fat biopsies  ***Outcome dx:***  Cases of BC from participating hospitals 1990-‘92 | Age, BMI, Centre, smoking, alcohol use, hormone use, SES | | ↑ vs ↓ quartile  \*OR 1.40 (95% CI, 1.02,1.93) | **Adipose tissue concentration: +ve assoc**  Wt. change could compromise the validity with which adipose tissue reflects long term intake. | |
| ([McCann et al., 2004](#_ENREF_26))  Case-control | | **Total CLA & 9c,11t-18:2 CLA**  CLAs intake & BC | | ***Country:*** US  WEB study  ***N=***3158 F  Case=1122  control= 2036  ***Age:*** 53.8 **(**35-79)y  ***CLA intake (mean mg/day):***  109±9 | | ***Dietary assessment:***  Self-administered 104 item FFQ.  Food composition data compiled by Washington State University  ***Outcome dx:***  Cases- histologically confirmed BC | Age, education, age at menarche, parity, age at 1st birth, BBD, FHx BC, residual fat adjusted for TEI | | No association with intake of total CLA or 9,11 CLA intakes and either pre or PM BC.  ↑ vs ↓ quartile of intake:  Premenopausal- slight inverse r’ship of having and ER –ve tumour Adj OR, (0.40. 95% CI 0.16-1.01) | **Intake: No assoc**  Results do not support association of CLA intake with overall risk of pre or PM  BCCLA intake may have been underestimated  Levels of intake may have been too low to see a benefit.  Dietary hx taken on intake 12-24 months before diagnosis. Adolescent diet may be more relevant in aetiology of BC | |
| ([Rissanen, Knekt, Jarvinen, Salminen, & Hakulinen, 2003](#_ENREF_32))  Case-control | | **Total TFA:**  FA of serum total lipids & BC | | ***Country***: Finland  Mobile Clinic Health Evaluation Survey  ***N=***369 F  Case 127  Control 242  ***Age:*** 19-89 y  ***FA conc ( % of serum):***  Vaccenic:  Cases: 0.41  Controls: 0.41  Trans MUFA  Cases:1.14 Controls:1.10 | | ***Serum FA***  ***Outcome Dx:***  Finnish Cancer Registry | BMI, chol, smoking, alcohol, parity, PAL, education. | | ↑ vs ↓ quartile serum FA:  Trans 11-18:1 assoc. ↑ BC risk  OR=3.69, CI =1.35-10.06 p=0.17  (trans-vaccenic)  After adj for BMI, Chol, alcohol, education, exercise & parity:  4.23 (CI=1.36-13.2)  Assoc. b/n total trans MUFA & BC non-significant | **No assoc. total serum trans MUFA & BC**  Long follow up source of bias as distribution of FA intake changed during FU. Serum FA compositions may have degraded during long storage time | |
| ([Saadatian-Elahi et al., 2002](#_ENREF_33))  Case-control | | **Elaidic acid**  18:1 n-9t  Serum elaidic acid & BC in pre & post MP women | | ***Country:*** US  NYUWHS  ***N***=394 F  Case=197  Control=197  ***Age:*** 51 (34-65)y  **Elaidic acid (% serum phospholipids):**  0.4±0.58 | | ***Serum FA:***  gas chromatography  ***Outcome dx:***  Clinically identified BC subjects | Age at full term birth, FHx BC, BBD, Chol, | | ↑ vs ↓ quintile serum FA:  Premenopausal OR 1.02 (0.36,2.88) p for trend =0.8  Postmenopausal OR 0.36 (0.13, 1.03) p for trend =0.13  Total: 0.66 (0.33,1.31) p for trend = 0.25 | **Serum: No assoc.**  b/t elaidic acid and pre or post-menopausal BC risk. | |
| ([Sczaniecka, Brasky, Lampe, Patterson, & White, 2012](#_ENREF_37))  Prospective | | **Total TFA**  Intake TFA & BC | | ***Country:*** USA  VITAL Cohort  ***N=*** 30 252 F  ***Age***: 50-76 y  6y FU  772 BC dx  ***TFA intake (reported as % of subjects per category of g/day):***  Cases:  <1.64g/day:19%  1.64≤2.36:19%  2.36≤3.22:21%  3.22≤4.58:21%  ≥4.58:19%  Non cases:  <1.64g/day:20%  1.64≤2.36:20%  2.36≤3.22:20%  3.22≤4.58:20%  ≥4.58:20% | | ***Dietary assessment:***  Self-reported 120 item SFFQ  ***Outcome dx:*** Population based cancer registry | Age, race, education, ht, BMI, age at menarche, age at 1st birth, age at menopause, hysterectomy, HRT, Oestrogen, FHx BC, Hx BBB, non-steroidal anti-inflammatory drugs, exercise, alcohol, vegetable intake, fruit intake, TEI | | HR & CI for assoc. FA intake and BC risk: (↑ vs ↓ quintile), p for trend.  TTFA:  HR= 1.27 (95% CI: 0.92, 1.78) p for trend= 0.08  \*TFA 18:2  HR =1.53 (95% CI: 1.07, 2.19) p for trend=0.02  TFA 18:1  HR= 1.30 (95% CI: 0.94, 1.80) p for trend= 0.07 | **Intake: total TFA no assoc.**  **+ve assoc linolelaidic acid and BC risk.**  Possibility that other constituents of foods ↑ in FA of interest could be responsible for ↑ risk | |
| ([Voorrips et al., 2002](#_ENREF_44))  Prospective | | **Total TFA, CLA, vaccenic**  Total TFA , CLA, vaccenic intake & BC | | ***Country:*** Netherlands  NLCS  ***N***=2539 F  Sub cohort: 1598  ***Age***: 55-69y  6.3 y FU  941 BC dx  ***TFA intake (g/day):***  Cases: 2.5±0.9  Sub cohort: 2.5±0.9 | | ***Dietary assessment:***  Validated 150 item FFQ- linked to database with data on specific FA in European foods (TRANSFAIR)  ***Outcome Dx:***  Regional cancer registries & Dutch national database of pathology | Age, Hx BBD, FHx. BC, age at menarche and menopause, oral contraceptive use, parity, age at childbirth, education, alcohol use, smoking, TEI. Fat intake adjusted for energy | | ↑ vs ↓ quintile of intake: p for trend  TTFA:  \*RR 1.30 (95% CI 0.93, 1.80)  P for trend =0.01  CLA:  \*RR 1.24 (95% CI 0.91, 1.69)  p for trend=0.02  Vaccenic acid:  \*\*RR 1.34 (95%CI 0.98, 1.82)  P for trend=0.006 | **Intake: +ve assoc total TTFA , CLA & vaccenic.**  CLA & vaccenic acid highly correlated (Pearson’s r =0.95). | |
| Colorectal | | | | | | | | | | | |
| ([McKelvey et al., 1999](#_ENREF_27))  Case-control | | **Total TFA**  TTFA &CAP | | ***Country***: US  **N**=1067, 65% M  Cases=516  Controls=551  ***Age*:** 61 (50-74)y  ***TFA intake (reported as number of subjects per category of g/day):***  Cases  <2 g/day: 141  2-<4:211  4-<6: 103  6+:61  Controls:  <2 g/day: 191  2-<4:251  4-<6: 73  6+:36 | | ***Dietary assessment:***  112 item self -administered SFFQ.  Foods containing PHVO were categorised into 4 groups (sweetened baked goods, candy bars, oils & condiments, French fries and chips)  ***Outcome dx:***  Sigmoidoscopy screening clinics | Age, sex, smoking, BMI, PA, TEI, red meat, vegetables, sweetened baked goods | | Association with TFA not signif after adjustment for sweetened baked goods and other covariates.  Sweetened baked goods ↑ vs ↓ category OR 2.1 (95% CI 1.3–3.5) after adjustment for other covariates  No signif assoc with other PHVO food groups | **Intake: No assoc. TFA & risk of CAP after adjustment for sweetened baked goods**  Results are consistent with hypothesis that foods ↑ in fat and sugar and ↓ in fibre and correlated micronutrients increase risk of adenomas | |
| ([Limburg et al., 2008](#_ENREF_23))  Prospective | | **Total TFA**  TFA intake & CRC | | ***Country***: US  IWHS  ***N***=35 216 F  ***Age***: 62 (55-69)y  18y FU  1229 CRC dx  ***TFA intake******(g/day):***  2.90 ± 1.59 | | ***Dietary assessment:***  126 item SFFQ  Harvard food composition database  ***Outcome dx***: CRC cases Identified through linkage with Iowa Cancer Registry & National Death Index | Age, TEI, BMI, PAL, oestrogen use, T2D, smoking, TFI, red meat, fruit & vegetable intake, calcium, Vit.E, folate, alcohol | | ↑ vs ↓ quartile of intake  TFA not associated with CRC risk (RR=1.12; 95% CI 0.96-1.32)  C18:1 (RR 1.05, 95% 0.87,1.26)  C18:2 (RR 1.02, 95% 0.85,1.23) | **Intake: No assoc. TFA & CRC** | |
| ([Lin, Zhang, Cook, Lee, & Buring, 2004](#_ENREF_24))  Prospective | | **Total TFA, t16:1, t18:1, t18:2**  TFA & CRC– a randomised trial of aspirin use | | ***Country***: US  WHS  ***N***=37547 F  ***Age***: 54 (≥45)y  8.7y FU  202 CRC dx  ***TFA intake by quintile (median % energy):***  1=0.6, 2=0.9, 3=1.1, 4=1.4, 5=1.9 | | ***Dietary assessment:***  131 item FFQ  ***Outcome dx:*** medical records and pathology | Age, random treatment assignment aspirin, BMI, FhX CRC, PAL, smoking, alcohol, HRT, TEI | | ↑ vs ↓ quintile of TFA intake, p for trend:  TTFA Adj. RR 1.59 (0.94-2.67) p for trend =0.06  Trans 16:1 RR 0.80 (0.51, 1.25)p for trend =0.22  Trans 18:1 RR 1.33 (0.87, 2.05)p for trend =0.2  Trans 18:2 RR 1.29 (0.84, 1.98) p for trend =0.24 | **Intake: no association TFA and CRC risk.**  A +ve association was seen between intake of fried foods away from home & CRC. TFA from PHVO may contribute to this  Limited statistical power due to small number of cases | |
| ([Slattery, Benson, Ma, Schaffer, & Potter, 2001](#_ENREF_38))  Case-control | | **Total TFA**  TFA & CRC | | **Country:** US  **N**=4403, 54.3% M  **Age:**30-79y  2179 <67y  2224>67y  ***TFA intake: g/1000kcal***  2.53±1.03 | | ***Dietary assessment:***  Adaptation of CARDIA diet hx q’airre.  Data collected via trained interviewers; participants asked to recall previous 2 y from diagnosis.  Nutrition Coordinating Centre food database  ***Outcome Dx:*** primary colon cancer-medical records | Age, BMI, PAL, TEI, fibre, calcium, oestrogen status | | ↑ vs ↓ quintile intake TTFA  Fully adjusted model only significant in women  \*OR 1.5 (1.1,2.0) | **Intake: +ve assoc. TFA intake & CRC in women only**  After adjustment women in highest quintile of intake 50% ↑ risk CRC compared to lowest.  Results suggest↑ TFA consumption may alter risk of CRC. Data suggests that those who do not use aspirin, NSAID’s or HRT may be more affected by TFA | |
| ([Theodoratou et al., 2007](#_ENREF_39))  Case-Control | | **Total TFA**  TFA intake &CRC | | ***Country:*** Scotland  SOCCS  ***N***=2910, 64.3% M  Cases 1455  Matched 1455  ***Age:*** 64.3 (16-79 y)  ***TFA intake (g/day)***  3.55 | | ***Dietary assessment:***  SFFQ 150 items validated in younger people  FA data from UK food comp tables and FOODBASE database.  ***Outcome dx:*** CRC presented to surgical unit in Scotland | Family hx CRC, TEI, TFI, alcohol, non-steroidal antiinflammatory drugs, smoking, BMI, PAL, total FA intake. | | ↑ vs ↓ quartile of TFA intake and risk of CRC  Trans MUFA:  \*OR 1.38 (1.09, 1.74)  Significant results only in females:  \*OR 1.57 (1.05,2.36)  CRC risk 57% higher in women in 4th vs 1st quintile of intake. | **Intake: +ve assoc. TFA intake & CRC in women only**  **Not signif in men** | |
| ([Vinikoor et al., 2009](#_ENREF_43))  Case-Control | | **Total TFA**  Investigate assoc. TFA & CRC race differences | | ***Country:*** US  NCCCS-1  ***N=***1643, 50.7% M  ***Age:*** 64.7 (40-80)y  Cases: 623  Controls: 1020  ***TFA intake (mean g/day, SD)***  5.47 ±2.65 | | ***Dietary assessment:***  Modified version of 100 item SFFQ block food frequency- 29 local foods added  Interviews by trained nurses.  ***Outcome Dx:***  North Caroline Central Cancer Registry | Age, sex, calcium intake, meat consumption, alcohol, BMI, family Hx CRC | | Energy adj TFA consumption was not associated with CRC.  ↑ vs ↓ quintile of intake:  Whites: Adj. OR 1.01 (95% CI 0.69, 1.49)  AA: Adj. OR 0.99 (0.61, 1.62) | **Intake: No assoc. TFA & CRC**  No assoc. found between ↑ consumption TFA & specific tumour location (proximal or distal colon) | |
| Pancreatic | | | | | | | | | | | |
| ([Heinen, Verhage, Goldbohm, & van den Brandt, 2009](#_ENREF_13))  Prospective | | Total TFA  Pancreatic cancer risk & fat intake | | ***Country*:** Netherlands  NLCS  ***N***=120 852, 48% M  ***Age****:* 61.7 (55-69)y  13y FU  350 incident cases  **TFA intake: (g/day)**  2.91±1.241 | | ***Dietary assessment:***  Self-administered validated 150 item FFQ  Database TRANSFAIR study  **Outcome dx:** Netherlands Cancer Registry & Netherlands Pathology Registry | gender, age, TEI, smoking, alcohol, T2D, HTN, BMI, Vegetables, Fruit | | No assoc. intake of TFA & pancreatic cancer in the total population in age and gender adjusted & multivariable adjusted.  ↑ vs ↓ quintiles of intake:  RR 1.14 (0.79-1.64) | **Intake: No assoc. TFA and pancreatic cancer risk** | |
| ([Michaud, Giovannucci, Willett, Colditz, & Fuchs, 2003](#_ENREF_28))  Prospective | | Total TFA  Pancreatic cancer & diet | | ***Country*:** US  NHS  ***N****=*88 802 F  ***Age***: 46.8 (30-55)y  18y FU  178 dx  ***TFA intake: median g/day):***  Q1=2.5, Q2=3.3, Q3=3.9, Q4=4.6, Q5=5.7 | | ***Dietary assessment:***  61 item SFFQ  1980,  131 item ’84,’86,’90  ***Outcome dx:***  Self-reported via q’airre. Medical records obtained for confirmation | Smoking, BMI, Hx T2D, TEI, Ht. PAL, menopausal status, glycaemic load intake. | | ↑ vs ↓ quintile of TFA intake:  RR 0.91 (95%CI 0.58, 1.43) p=0.44 | **Intake: No assoc**. **TTFA and pancreatic cancer risk** | |
| ([Thiébaut et al., 2009](#_ENREF_40))  Prospective | | Total TFA  Pancreatic cancer & fat intake | | **Country:** US  National Institutes of Health- AARP Diet and Health Study  US  ***N*=**525473, 58.7% m  *Age:* 62 (50-71y)  6.3 y FU  **TFA intake***: not reported* | | ***Dietary assessment:***  124 item FFQ grid based version of NCI diet history q’airre.  1995-‘96  USDA Continuing survey of food intake by individuals database.  ***Outcome dx:***  Cancer dx or death | Sex, TEI, smoking, BMI, T2D, | | ↑ vs ↓ quintile intake:  Trans 16:1:  \*\*HR 1.38 (95%CI 1.17,1.64).  Trans 18:1:  HR 1.01 (95%CI 0.85, 1.20) p=0.98  Trans 18:2:  HR 1.00 (95%CI 0.84, 1.19) p=0.69  Total TFA:  HR 0.99 (95%CI 0.83, 1.17) p=>.99 | **Intake: No association TTFA & pancreatic cancer risk**  **+ve assoc. trans 16:1** (palmitelaidic)  Report some internal inconsistencies with results.  Measurement error in reported dietary intakes | |
| Prostate | | | | | | | | | | | |
| ([Chavarro et al., 2008](#_ENREF_5))  Prospective | | **Total TFA, elaidic acid, 18:2t**  Elaidic acid, 18:2t, total TFA & prostate cancer | | ***Country:*** US  PHS  ***N=***14916, m  ***Age***:58 (40-84y)  13y FU  476 dx  ***TTFA % of total FA***  1.82 | | ***Serum TFA:***  gas liquid chromatography.  ***Outcome dx:***  Hospital and pathology records | Age, smoking status, length of FU | | *Prostate Cancer*  ↑ vs ↓ quintile of TFA levels:  No significant associations  *Non aggressive prostate tumours:*  Elaidic acid:  RR 2.16 (1.12-4.17 p trend=0.11)  18:2t:  RR\*1.97 (1.03-3.75 p trend = 0.01)  Total TTFA:  RR 2.21 (95%CI 1.14-4.29 p trend =0.06) | **Serum: No significant assoc. for serum TFA and prostate cancer**  **Elaidic acid assoc.↑ risk** **non aggressive tumours** | |
| ([King, Kristal, Schaffer, Thornquist, & Goodman, 2005](#_ENREF_19))  Case-Control | | **Total TFA- and individual FA**  Serum phospholipid TFA & prostate cancer | | ***Country***: US  Β-Carotene & Retinol efficacy trial  ***N***=698, M  Cases=272  Controls=426  ***Age:*** *<55-*≥65y  ***TFA Serum (mean % of FA):***  Cases: 0.23  Controls:0.22 | | ***Serum TFA:***  gas chromatography  ***Outcome dx:***  Cancer end point reported- medical & pathology reports obtained from hospital | Exposure population, period of enrolment, enrolment centre, age group, year of randomisation, ethnicity, baseline smoking status, age at blood draw, BMI, alcohol use | | ↑ Vs ↓ quartile phospholipid conc.  \*11t 18:1 trans Vaccenic acid: OR 1.69 (1.03-2.77)  \*9c,12t 18:2: OR  1.79 (1.02-3.15)  Elaidic 1.39 (0.87-2.23) p=0.1 | **Serum: +ve assoc. C18 TFA but not C16 TFA with prostate cancer**  Consistent trends for ↑ risk across all C18 FA but not C16 TFA but only 2 mentioned reached statistical significance.  Non-significant +ve assoc elaidic acid | |
| ([Schuurman, van den Brandt, Dorant, Brants, & Alexandra Goldbohm, 1999](#_ENREF_36))  Prospective | | **Total TFA**  Energy and fat intake with prostate carcinoma risk. | | ***Country:***  Netherlands  NLCS  ***N***=3640, M  ***Age*** 62.65 (55-69)y  6.3y FU  642 dx  **TFA intake (mean g/day):**  3.3 | | ***Dietary assessment:***  Self-administered SFFQ 150 items  Intake on specific FA based on food composition database from TRANSFAIR study.  ***Outcome dx:*** Netherlands cancer registries | Age, family hx prostate carcinoma, education, SES, TEI, total energy adjusted fat intake | | ↑ vs ↓ quintile  No assoc. TTFA intake and prostate carcinoma:  RR 0.99 (0.70-1.40 p 0.72) fully adjusted model. | **Intake: No assoc.**  This study found no associations between prostate carcinoma and intake of energy, total fat, TSFA, or TFA. Authors conclude that certain FA may be involved in PC occurrence. | |
| Type 2 Diabetes | | | | | | | | | | | |
| ([Mozaffarian et al., 2013](#_ENREF_29))  Prospective | | **Trans-palmitoleate**  Trans-palmitoleate & T2D | | ***Country:*** US  MESA  ***N=***2617, 46.7% M  ***Age:*** 61.7 (45-84)y  5y FU  205 dx  ***Trans-palmitoleic acid (% of FA):***  0.058 | | ***Serum FA***  ***Outcome dx***:  Assessed at study clinic biannually. Dx on new fasting glucose of ≥126mg/dL or new use of insulin or oral hypoglycaemic medications | Age, sex, race, education, centre, smoking, diabetes, alcohol, PAL, BMI, WC, whole fat dairy, low fat dairy, red meat, TEI | | MV adjustment: ↑ vs ↓quintile of serum TFA  \*HR: 0.52 (95% CI 0.32,0.85) | **Serum: -ve assoc** T2D &  Intake: | |
| ([Papantoniou, Fito, Covas, Munoz, & Schroder, 2010](#_ENREF_31))  Cross-sectional | **Total TFA**  T2D risk &TFA consumption | | | | ***Country:*** Spain  ***N***=8195, 45%M  ***Age:*** 54.2 (35-74)y  ***Intake TFA (g/day):***  1.5 women; 1.8 men. | ***Dietary assessment:***  165 item validated FFQ  ***Outcome dx:*** Fasting BG & T2D  Hx recorded. ADA criteria used for diagnosis of T2D | Age, PA, educational status smoking, alcohol, fibre | | No sig. association between TFA intake and risk of type 2 diabetes in men and women  Men: p=0.909  Women: p=0.990 | **Intake: No association b/t TFA intake & T2D risk.**  ↑TFA intake was assoc. less healthy lifestyle and dietary habits | |
| ([Salmerón et al., 2001](#_ENREF_34))  Prospective | | **Total TFA**  Dietary fat intake & T2D  *.* | | ***Country:*** US  NHS  ***N=***84 204 F  ***Age***:46.3 (34-59)y  14y FU  2507 cases T2D  ***Intake TFA (%E):***  2 | | ***Dietary assessment:***  1980 61 item SFFQ  1984 expanded 116 items ’86 &’90  ***Outcome Dx:***  WHO criteria 1985 used. 98% of medical records reviewed | Age, BMI, time period, smoking, parental T2D, alcohol, PAL, % energy protein, TEI | | ↑ vs ↓quintile of TFA intake:  MV RR 1.15 (1.01, 1.32) p for trend = 0.09  Additionally adjusted for other fats:  \*RR 1.31 (1.10, 1.56) p for trend = 0.02  \*\*2% ↑ in energy from TFA;  RR 1.39 (1.15, 1.67) | **Intake: +ve association TFA & T2D**  +ve assoc. TFA observed primarily in obese and less physically active women | |
| ([van Dam, Willett, Rimm, Stamper, & Hu, 2002](#_ENREF_41))  Prospective | | **Total TFA**  Dietary fat, meat intake & T2D | | ***Country:*** US  HPFUS  ***N:*** 42 504 M  ***Age:*** 53.7 (40-75)y  12y FU  1321 dx  ***TFA intake (median E%)***  1.3 | | ***Dietary assessment:***  131 item validated SFFQ at baseline, 1990 & ‘94  ***Outcome dx.:*** T2D confirmed based on WHO criteria, verified with medical records in sub sample of 71 participants. | Age, TEI, time period, PAL, alcohol, hypercholesterolemia, HTN, FHx T2D, Fibre, Magnesium, BMI | | ↑ vs ↓quintile of intake:  Age & energy adjusted RR (95% CI)  \*\*1.39 (1.16, 1.67)  Fully adjusted MV model:  0.90 (0.74-1.10) p=0.33 | **Intake: TFA not assoc with T2D** | |
| Other Conditions | | | | | | | | | | | |
| ([Cho et al., 2001](#_ENREF_7))  Prospective | | **Total TFA**  Fat intake and AMD | | ***Country*:** US  NHS & HPFUS  ***N***=72489, 41% M  ***Age***: 56.2y  12y FU  567 dx  ***TFA intake (median % E)***  Women: Q1; 1.2. Q2; 1.6, Q3; 1.9, Q4; 2.2, Q5 2.7  Men: Q1; 0.7, Q2; 1.0, Q3; 1.2, Q4; 1.5, Q5; 1.9 | | ***Dietary assessment:***  130 item SFFQ; women 1984, ’86, ’90 & men 1986, ‘90  ***Outcome dx:***  Incident AMD with visual loss of 20/30 or more. Medical records reviewed | Age, pack years of smoking, energy, lutein and zeaxanthin intake, BMI, PM hormone use, vigorous exercise, alcohol intake, profession | | ↑ vs ↓ quintile of intake:  Pooled RR (95% CI):  \*1.35 (1.02, 1.80)  After adjustment for quintiles of all fats simultaneously risk was attenuated.  1.26 (0.89,1.79) p=0.22 | **Intake: no assoc. TTFA intake and AMD** (after adjustment for other fats) | |
| ([Chong et al., 2009](#_ENREF_8))  Prospective | | **Total TFA**  Dietary fat intake and AMD | | ***Country***: Australia  MCCS  ***N****=*6734, 64% F  ***Age***: 64.1 (58-69y)  16y FU  ***TFA intake (g/day):***  0.08 | | ***Dietary assessment:***  121 Item FFQ  ***Outcome dx:*** At nonstereoscopic retinal photographs of disc and macular of each eye taken. Reviewed by AMD physicians | Age, sex, smoking, energy, VitC, VitE, β carotene, zinc, lutein, zeaxanthin, supplements (VitC, VitE, cod liver oil, fish oil | | ↑ vs ↓ quartile of intake:  OR (95% CI):  Late AMD: 1.76 (0.92-3.37)  Early AMDa :0.92 (0.78, 1.09)  Early AMDb: 0.98 (0.80,1.20) | **Intake: no assoc. TFA intake and early or late AMD** | |
| ([Cohen, Rifas-Shiman, Rimm, Oken, & Gillman, 2011](#_ENREF_9))  Prospective | | **Total TFA**  Maternal TFA intake during pregnancy and foetal growth | | ***Country*:** USA  Project Viva  ***N*=**1369 mother-child pairs  ***Age***: 32.4y  FU 1st & 2nd trimester  ***TFA intake (g/day):***  2.35 ± 1.07 | | ***Dietary assessment:***  Self-administered validated SFFQ during 1st & 2nd trimesters.  ***Outcome dx:***  Data on infant birth wt from medical records. Length of gestation by subtracting date of last menstrual period from day of delivery. BW/GA z value (foetal growth) using US ref data | TEI, race, income, parity, education, smoking status, age pre-pregnancy BMI, PA, television viewing, fish consumption | | Total TFA intake & Foetal Growth:  1st trimester no assoc.  β=0.02; (95% CI -0.20,0.25)  2nd trimester +ve assoc.  \*β=0.29; (95% CI 0.07,0.51) | **Foetal growth: + assoc in 2nd trimester** | |
| ([Dirix, Kester, & Hornstra, 2009](#_ENREF_10))  Prospective | | **18-1*t isomer***  ***(elaidic acid)***  Associations b/t neonatal birth dimensions and maternal plasma fatty acid contents | | ***Country:*** Netherlands  MEFAB  ***N*=**782 mother-infant pairs  ***Age***: 29y  ***Serum TFA*:** (% w/w) as median (25th-75th percentile)  maternal plasma PL:  16 w: 0.45 (0.33-0.59)  22 w: 0.44 (0.32-0.58)  32w: 0.42 (0.31-0.54)  Delivery: 0.37 (0.27- 0.49) | | ***Serum TFA:***  Maternal serum samples collected at 16, 22, 32 weeks & delivery.  ***Outcome dx:***  Local hospital staff members recorded BW, BL & HC on standardised data sheets | Maternal age, Ht, BMI, parity, smoking & drinking during pregnancy, socioeconomic status, GA, infant sex | | None of the assoc. b/t relative maternal 18:1t contents and BW, BL or HC reached statistical significance or showed a trend.  Backward regression analysis demonstrated that for none of the 12 birth outcome FA combinations 18:1t was neither a predictor or confounder.  Results not published | **Serum: No assoc between neonatal birth dimensions and maternal plasma fatty acid contents**  Considerable number of 18:1t values missing from database, | |
| ([Engelhart et al., 2002](#_ENREF_11))  Prospective | | **Total TFA**  TFA intake & dementia | | ***Country*:** The Netherlands  The Rotterdam Study  ***N*=** 5395, 41%M  ***Age*:** 67.7 **(**≥55)y  16y FU  197 dx  ***TFA intake (g/day):***  2.7 ± 1.0 | | Validated SFFQ  Food composition database derived from the TRANSFAIR Study and Dutch Food Composition Table | Age, sex, education, total energy intake, intake of vitamin E | | Rate ratios of dementia per  standard deviation increase in TFA intake: 0.90 (95% CI 0.77 to 1.06), | **Intake: no assoc between TTFA and dementia risk** | |
| ([Enke et al., 2011](#_ENREF_12))  Cross-sectional | | **Total TFA**  Distribution of TFA in foetal cord blood related to maternal lipids | | ***Country*:** Germany  ***N*=** 55, mother-child pairs  ***Age*:** mothers29.2y | | ***TFA in erythrocytes and plasma:***  t9t12, c9t12, t9c12, C18:2; t3,c9,c11 & c8,t10,t12 C18:3 were summarised as TTFA  Collected at birth |  | | Fatty acids in maternal and foetal plasma (% of total FAME, m ± SD)  \*\*TTFA maternal 0.59 ± 0.12; foetal: 0.52 ± 0.17 \*\*r=0.36  \*\*C9,t11 CLA maternal 0.20 ± 0.07; foetal: 0.14 ± 0.04 r=0.84  Fatty acids in maternal and foetal erythrocytes (% of total FAME, m ± SD)  \*\*TTFA maternal 0.82 ± 0.15; foetal: 0.64 ± 0.45 \*\*r=0.07  \*\*C9,t11 CLA maternal 0.12 ± 0.04; foetal: 0.08 ± 0.04 \*\*r=0.32 | **Serum: +ve assoc TTFA in maternal plasma correlated with TTFA in foetal plasma but not adjusted for any confounders** | |
| ([Iuliano et al., 2013](#_ENREF_15))  Case-control | | **Individual TFA**  Individual FTA & mild Alzheimer’s disease | | ***Country*:** Germany  ***N*=** 60, 28%M  ***Age*:** 70y  Cases: 30  Controls:30  ***Serum TFA (% total FA):***  C18:1 (n-7) vaccenic  Controls: 1.96±0.3  Cases: 2.26±0.4  C18:1 (n-9)t elaidic  Controls: 0.04±0.02  Cases: 0.04±0.03  C18:2 (n-9)t linoleadic  Controls: 0.04±0.02  Cases: 0.04±0.01 | | ***Serum TFA:***  gas chromatography | Comparison among groups done for gender, age, educational level and global cognitive level | | \*\*Pts with Alzheimer’s disease had significantly higher intakes C18:1 (n-7) vaccenic compared with controls P=0.0029 | **Serum: +ve assoc vaccenic acid and Alzheimer’s disease** | |
| ([Kim et al., 2005](#_ENREF_18))  Cross-sectional | | **No TFA data**  **Margarine consumption**  Asthma and allergy in relation to diet | | ***Country*:** Sweden  ***N=***1014, 51% F  ***Age*:** Median 9 (5-14) y  114 subjects reported allergy intolerance  TFA intake not measured  ***Margarine intake:***  Consumption yes/no  No=19%  Yes=81 | | ***Dietary assessment:***  TFA not assessed. 7 question dietary questionnaire administered. Measured consumption of meat, fish, fruits, veg, fresh milk, fermented milk and fast food. Q’airre contained yes/no questions on 5 types of fat.  ***Outcome dx:***  Current asthma assessed as current medication or attack in past 12 months. Additional questions on cat allergy, dog allergy, pollen allergy. | Age, gender, 12 dietary variables (meat, fish, fruits, veg, fresh milk, fermented milk, fast food, butter, margarine, olive oil, rapeseed oil, PUFA) | | *R’ship b/t consumption of margarine, respiratory symptoms and asthma*  *OR (95% CI):*  Wheeze: 0.68 (0.38-1.23)  Daytime breathlessness: 1.23 (0.51-2.96)  Current asthma: 0.79 (0.37-1.68)  Atopic sensitisation: 0.86 (0.52-1.42)  *With regards to allergens:*  Among those consuming margarine, there were significant positive associations (P<0.05) between wheeze and dog and horse allergen levels, daytime attacks of breathlessness and cat, dog and horse allergen levels, current asthma and dog and horse allergen levels.  No significant associations among children not consuming margarine | **Intake: +ve assoc.** in those consuming margarine b/t:  respiratory symptoms, asthma and allergens. | |
| ([Nagel & Linseisen, 2005](#_ENREF_30))  Case-control | | **No TFA date: Margarine intake**  Assoc b/t margarine & asthma | | ***Country*:** Germany  Multicentre  EPIC Cohort  ***N:*** 525, 35% M  ***Age***: <50-≥60 y  Case: 105  Control: 420  TFA intake not measured  ***Margarine intake:*** (Median g/day, 33-66 percentiles):  Cases: 1.0 (0-4.1)  Controls: 0.3 (0-1.8) | | ***Dietary assessment:***  Self-administered FFQ- didn’t look at TFA specifically. Food intake data calculated from German food composition tables.  ***Outcome dx:***  Physician diagnosed asthma based on clinical examination, skin prick tests, lung function tests. | Age, fat energy intake, non-fat energy intake, BMI, smoking status, gender, educational level. | | Margarine intake was significantly higher in cases than controls: p= 0.029  ↑ vs ↓ tertile of intake:  OR (95% CI):  1.73 (1.05-2.87), P for trend=0.05 | **Intake: borderline assoc b/t margarine intake and asthma.**  (p for trend of 0.05) | |
| ([Sausenthaler et al., 2006](#_ENREF_35))  Prospective | | **No TFA data:**  **Margarine intake**  Intake of margarine with eczema and allergic sensitization in 2 y olds. | | ***Country*:** Germany  LISA  ***N*=**2582, 51 % M  FU till babies were 2 y  188 (7.2%) predominantly consumed margarine.  **TFA intake:**  Not measured | | ***Dietary assessment:***  SFFQ. Parents were asked how often they used margarine in past 6 months  ***Outcome dx:***  Symptomatic eczema- itchy rash recurrent or persisting over 14 days. Doctor dx of eczema.  Allergic sensitisation: measured specific IgE to common food allergens | Study area, gender, maternal age at delivery, maternal smoking during 2nd or 3rd trimester, education level, breastfeeding exclusively for 4 months, parental hx of atopic diseases, fresh fruit intake, salad and raw veg intake, dog, cat. | | Adjusted OR (95% CI) b/t exposure category & margarine:  Eczema symptoms:  2Yr:  Margarine: 1.30 (0.67-2.55)  Lifetime prevalence:  \*Margarine: 1.71 (1.12-2.61)  Doctor dx eczema:  2Yr:  Margarine: 1.70 (0.84-3.41)  Lifetime prevalence:  \*Margarine: 2.10 (1.36-3.25)  Food or inhalant allergens:  Margarine: 1.52 (0.89-2.58)  Food allergens:  Margarine: 1.58 (0.87-2.86)  Inhalant allergens:  \*Margarine: 2.10 (1.01-4.41) | **Intake: margarine +ve assoc.** lifetime prevalence of symptomatic eczema, Dr dx eczema and allergic sensitization against inhalants.  All response variables risk was higher in infants with predominant margarine intake than the mixed group but only statistically sig in these 3 groups.  No associations were found for butter intake. | |
| ([van Eijsden, Hornstra, van der Wal, Vrijkotte, & Bonsel, 2008](#_ENREF_42))  Prospective | | **18-1*t isomer***  **(elaidic acid)**  Elaidic acid & foetal growth | | ***Country*:** Holland  ABCD study  ***N*=**3704, F  ***Age*:** ≤24-≥ 35 y  ***Serum TFA (% of FA):***  Elaidic acid 0.23 ± 0.10 | | ***Dietary assessment:***  gas chromatography  ***Outcome dx:***  BW (g)  SGA (yes/no) defined as below 10th percentile for GA | Maternal BMI, smoking, alcohol, psychosocial stress, cohabitant status, education, ethnicity | | ↑ vs ↓ quintile:  Values are β ± SE:  BW: -14.2 ± 20.9  ↑ vs ↓ quintile:  Values are OR (95% CI)  SGA: 1.01 (0.74, 1.39) | **Serum: No assoc. BW or SGA & elaidic acid**  The observed negative association between the maternal elaidic acid conc and foetal growth disappeared after adjustment**.** | |
| ([Wieland, von Mutios, Husing, & Asher, 1999](#_ENREF_45))  Ecological | | **Total TFA**  Intake of TFA& prevalence of  childhood asthma and allergies | | ***Country*:** Multicountry -Europe  ISAAC  ***N*=** 55 study centresin10 European countries  ***Age*:** 13-14 y  ***Intake TFA (% E):***  Range 0.5-1.4 | | ***Dietary assessment:***  Country estimates using representative market baskets per country  ***Outcome dx:***  12-month prevalence of symptoms of asthma, allergic  rhinoconjunctivitis, and atopic eczema assessed via written and video questionnaires | Gross national product of the country | | Positive association between TFA and prevalence of symptoms of asthma, allergic rhinoconjunctivitis, and atopic eczema**,** all p<0·001  The associations tended to be stronger when the analyses were restricted to estimates of TFA intake from sources that contain predominantly PHVO, such as oils, biscuits, cakes, and chips | **Intake: +ve assoc TFA and asthma and allergies**  Ecological study - observed association between populations does not necessarily exist between individuals. | |

ABCD study; Amsterdam Born Children and their Development, BCDDP; Breast Cancer Detection Demonstration Project. EPIC; European Prospective Investigation into Cancer & Nutrition, EURAMIC; European Community Multicentre Study on Antioxidants, HPFUS; Health Professionals Follow Up Study, ISAAC; International Study of Asthma and Allergies in Childhood, IWHS; Iowa Women’s Health Study, LISA; MCCS; Melbourne Collaborative Cohort Study, MEFAB; Maastricht Essential Fatty Acid Birth Cohort, MONICA, Monitoring of trends and cardiovascular disease study, MSP; Mammary Screening Project, MESA; Multiethnic Study of Atherosclerosis. NCCCS-1. North Carolina Colon Cancer Study-1;NCS; Norwegian Counties Study NLCS, Netherlands Cohort Study; NHS; Nurses’ Health Study, NYUWHS; New York University Women’s’ Health Study, PHS; Physicians Health Study, REGARDS; Reasons for Geographical & Racial Differences in Stroke, SOCCS; Study of Colorectal Cancer in Scotland. VIP; Vasterbotten Intervention Project, WEB; Western New York Exposures and Breast Cancer Study; WHI-OS; Women’s’ Health Initiative-Observational Study. WHS; Women’s Health Study

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| --- | --- | --- | --- |
| **Abbreviations**  \*\* Significant (P < 0.01)  \* Significant (P < 0.05)  +ve=positive  -ve=negative  ADA=American Diabetes Association  AMD= Age-related macular degeneration  AMDa= drusen 63μm or larger  AMDb= 123 μm or larger  Assoc.= Associated  BC= breast cancer  BBD= benign breast disease  b/t = between  BW = birth weight  BL = birth length  CAD=coronary artery disease  CAP= colorectal adenomatous polyps  CRC=colorectal cancer  CRP=c reactive protein  CI= confidence interval  CIn= cerebral Infarction  Dx= diagnosis  E = energy  ↑ = Highest/increase  ↓ = Lowest/ decrease  FAME=fatty acid methyl esters  f=female | FFQ=food frequency questionnaire  FU= follow up  GA= gestational age  HDL-C= HDL cholesterol  HR= hazard Ratio  Hrs. = hours  Ht. = height  HTN=hypertension  HVO=hydrogenated vegetable oil  Hx = history  IHD= ischaemic heart disease  Inv.= inverse  IS= ischaemic stroke  LDL-C=  m=male | MI= myocardial Infarction  MUFA=monounsaturated fatty acids  MV= multivariate model  N=number  OR= odds ratio  PA= physical activity  PHFO= partially hydrogenated fish oil  PHVO= partially hydrogenated vegetable oil  Pt.=patient  PVD= peripheral vascular disease  RR= risk ratio  rTFA= ruminant TFA  SCD= sudden cardiac death  SF= saturated fat  SFA= saturated fatty acids | SFFQ= Semi-quantitative food frequency questionnaire  SGA= small for gestational age  TEI= Total energy intake  T2D = Type 2 Diabetes  TFA=Trans fatty acids  TTFA= Total trans fatty acids  Vs.= versus  WHR= waist to hip ratio  w/o = without  wks. = weeks  y=years  **Units**  mmol/L = Millimoles per litre |

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