**Supplementary Materials for Trichia et al., Associations of types of dairy consumption with adiposity: cross-sectional findings from over 12,000 adults in the Fenland Study, UK**

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| Supplemental Table 1. Descriptive characteristics of dietary factors for the bottom (non-consumers) and top categories of milk, yoghurt and cheese consumption (g/d), as well as in the all eligible participants (n=12,065) of the Fenland study, UK\* | | | | | | | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Dietary variables** | **Overall** | | **Milk**† | | | | **Yoghurt**† | | | | **Cheese**† | | | |
| 293 | | (146-439) | | 35.3 | | (8.8-71.8) | | 14.6 | | (4.8-26.9) | |
| 0g/d | | 585-732g/d | | 0g/d | | 99.5-1,134g/d | | 0g/d | | 26.8-284g/d | |
| n=12,065 | | n=921 | | n=1,490 | | n=2,787 | | n=3,014 | | n=779 | | n=3,028 | |
| **Dairy products** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Full-fat milk | 0.0 | (0.0 - 0.0) | 0.0 | (0.0 - 0.0) | 0.0 | (0.0 - 0.0) | 0.0 | (0.0 - 0.0) | 0.0 | (0.0 - 0.0) | 0.0 | (0.0 - 0.0) | 0.0 | (0.0 - 0.0) |
| Low-fat milk | 293 | (146 - 293) | 0.0 | (0.0 - 0.0) | 585 | (585- 585) | 146 | (132 - 293) | 293 | (146 – 397) | 265 | (132 - 293) | 293 | (146 - 293) |
| Full-fat yoghurt | 0.0 | (0.0 – 8.8) | 0.0 | (0.0 – 8.8) | 0.0 | (0.0 – 8.8) | 0.0 | (0.0 - 0.0) | 0.0 | (0.0 – 17.6) | 0.0 | (0.0 – 8.8) | 0.0 | (0.0 – 8.8) |
| Low-fat yoghurt | 17.6 | (0.0 – 54.2) | 8.8 | (0.0 – 54.2) | 17.6 | (0.0 – 54.2) | 0.0 | (0.0 - 0.0) | 99.5 | (99.5 – 126) | 8.8 | (0.0 – 54.2) | 54.2 | (0.0 – 99.5) |
| High-fat cheese | 14.6 | (4.8 – 14.6) | 14.6 | (2.4 – 14.6) | 14.6 | (4.8 – 14.6) | 14.6 | (2.4 – 14.6) | 14.6 | (4.8 – 14.6) | 0.0 | (0.0 - 0.0) | 26.9 | (14.6 – 34.0) |
| Low-fat cheese | 0.0 | (0.0 – 4.2) | 0.0 | (0.0 – 4.2) | 0.0 | (0.0 – 4.2) | 0.0 | (0.0 – 0.0) | 0.0 | (0.0 – 8.4) | 0.0 | (0.0 - 0.0) | 4.2 | (0.0 – 25.8) |
| Cream | 0.0 | (0.0 – 2.8) | 0.0 | (0.0 – 1.4) | 0.0 | (0.0 – 2.8) | 0.0 | (0.0 – 1.4) | 0.0 | (0.0 – 2.8) | 0.0 | (0.0 - 0.0) | 0.0 | (0.0 – 2.8) |
| Butter | 1.4 | (0.0 – 8.2) | 1.3 | (0.0 – 7.6) | 1.4 | (0.0 – 8.6) | 1.4 | (0.0 – 8.0) | 0.9 | (0.0 – 7.9) | 0.0 | (0.0 – 4.3) | 2.8 | (0.0 – 10.0) |
| Ice-cream | 5.7 | (0.0 – 5.7) | 5.7 | (0.0 – 5.7) | 5.7 | (0.0 – 11.3) | 5.7 | (0.0 – 5.7) | 5.7 | (0.0 – 11.3) | 5.7 | (0.0 – 5.7) | 5.7 | (0.0 – 11.3) |
| Low-fat fermented dairy products | 39.5 | (8.8 – 99.5) | 21.8 | (0.0 – 88.8) | 34.9 | (8.8 – 80.0) | 0.0 | (0.0 - 0.0) | 126 | (108 – 139) | 8.8 | (0.0– 54.2) | 63.0 | (17.6 – 125) |
| Fermented dairy products | 54.2 | (22.0 – 104) | 38.2 | (14.6 – 103) | 49.9 | (22.4 – 97.0) | 14.6 | (4.8 – 14.6) | 139 | (123 – 160) | 8.8 | (0.0– 54.2) | 91.2 | (48.2 – 146) |
| High-fat dairy products | 26.0 | (14.6 – 45.3) | 20.3 | (9.5 – 34.5) | 27.4 | (14.6 – 56.4) | 24.6 | (12.7 – 46.7) | 26.0 | (14.6 – 44.0) | 7.9 | (1.4 – 31.8) | 40.4 | (29.0 – 62.3) |
| Low-fat dairy products | 301 | (159 - 439) | 21.8 | (0.0 – 88.8) | 639 | (585 – 728) | 154 | (136 – 297) | 401 | (272 – 538) | 293 | (132 – 427) | 318 | (180 – 447) |
| Total dairy products | 344 | (220 – 478) | 55.5 | (23.0 – 117) | 681 | (627 – 759) | 303 | (162 – 408) | 436 | (306 – 570) | 303 | (160 – 453) | 382 | (259 – 508) |
| **Other dietary factors** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Fruits | 203 | (109–323) | 208 | (106–333) | 195 | (98.1–318) | 139 | (57.7–253) | 271 | (170–405) | 176 | (84.0–307) | 238 | (135–368) |
| Vegetables | 234 | (166–319) | 261 | (177–357) | 225 | (149–309) | 198 | (134–278) | 262 | (191–360) | 209 | (130–303) | 263 | (189–357) |
| Potatoes | 80.2 | (54.2–116) | 71.4 | (35.2–92.2) | 89.0 | (62.6–125) | 89.0 | (59.1–125) | 80.2 | (53.8–116) | 80.2 | (44.0–125) | 80.2 | (53.8–119) |
| Legumes | 54.2 | (31.4–81.1) | 53.6 | (28.4–87.6) | 57.2 | (34.8–83.7) | 52.5 | (28.4–79.7) | 56.9 | (33.3–82.7) | 54.5 | (27.4–81.3) | 59.5 | (35.3–87.4) |
| Processed cereals | 78.9 | (46.5–122) | 66.6 | (35.3–117) | 82.9 | (53.0–130) | 74.7 | (42.7–116) | 76.4 | (45.8–122) | 64.3 | (36.6–111) | 89.7 | (53.1–134) |
| Whole-grain cereals | 55.7 | (19.7–120) | 52.9 | (17.8–132) | 58.8 | (18.9–129) | 30.0 | (9.1–87.5) | 71.3 | (28.0–145) | 39.8 | (12.9–114) | 72.4 | (28.0–143) |
| Poultry and eggs | 53.0 | (23.1–56.5) | 49.5 | (21.5–56.5) | 53.0 | (23.1–71.0) | 49.5 | (23.1–56.5) | 53.0 | (23.1–71.0) | 49.5 | (21.5–56.5) | 53.0 | (23.1–71.0) |
| Red meat | 43.2 | (21.7–69.3) | 36.2 | (12.9–63.0) | 49.6 | (26.8–80.5) | 46.2 | (24.2–74.0) | 39.7 | (20.3–64.5) | 42.6 | (20.3–71.5) | 39.2 | (19.3–67.4) |
| Processed meat | 26.5 | (13.2–42.7) | 20.4 | (6.2–35.1) | 30.7 | (16.5–49.1) | 30.1 | (15.5–50.4) | 24.4 | (11.3–39.9) | 24.6 | (10.6–46.0) | 24.9 | (10.4–43.2) |
| Fish | 35.4 | (20.2–57.1) | 35.4 | (19.2–65.1) | 36.3 | (23.4–58.7) | 30.5 | (16.1–48.3) | 39.4 | (24.0–65.1) | 32.1 | (16.1–54.6) | 36.3 | (20.2–60.2) |
| Sauces | 18.0 | (8.7–30.1) | 15.9 | (6.6–27.9) | 19.2 | (9.5–30.9) | 17.1 | (6.6–29.5) | 19.3 | (9.7–31.9) | 13.8 | (4.5–27.9) | 20.5 | (10.8–33.4) |
| Margarine | 4.3 | (0.0-10.0) | 4.3 | (0.0-10.0) | 7.1 | (0.7-10.0) | 4.3 | (0.0-10.0) | 4.3 | (0.0-10.0) | 4.3 | (0.0-10.0) | 5.0 | (0.0-10.0) |
| Nuts | 2.1 | (0.0–4.2) | 2.1 | (0.0–12.9) | 2.1 | (0.0–4.2) | 2.1 | (0.0–4.2) | 2.1 | (0.0–4.2) | 2.1 | (0.0–4.2) | 2.1 | (0.0–4.2) |
| Sweet snacks | 74.5 | (43.4–121) | 59.0 | (32.8–104) | 86.7 | (50.8–138) | 76.0 | (43.3–128) | 69.8 | (40.2–114.1) | 69.7 | (34.9–120) | 79.7 | (46.7–131.1) |
| Sugar-sweetened beverages | 14.0 | (0.0-40.0) | 2.8 | (0.0–31.6) | 17.2 | (0.0–45.6) | 16.8 | (0.0-68) | 5.6 | (0.0-40.0) | 14.0 | (0.0–45.2) | 14.0 | (0.0-40.0) |
| Artificially sweetened beverages | 0.0 | (0.0-28.0) | 0.0 | (0.0-28.0) | 0.0 | (0.0-28.0) | 0.0 | (0.0-28.0) | 0.0 | (0.0-86.0) | 0.0 | (0.0-28.0) | 0.0 | (0.0-28.0) |
| Fruit juice | 16.8 | (8.4–94.8) | 16.8 | (8.4–94.8) | 16.8 | (8.4–94.8) | 16.8 | (0.0–51.6) | 51.6 | (8.4–120) | 16.8 | (0.0–94.8) | 51.6 | (8.4–120) |
| Regular coffee | 190 | (13.3-475) | 150 | (0.0-475) | 190 | (13.3-475) | 190 | (0.0-475) | 190 | (0.0-475) | 81.7 | (0.0-475) | 190 | (13.3-475) |
| Decaffeinated coffee | 0.0 | (0.0-13.3) | 0.0 | (0.0-13.3) | 0.0 | (0.0-13.3) | 0.0 | (0.0-0.0) | 0.0 | (0.0-13.3) | 0.0 | (0.0–0.0) | 0.0 | (0-13.3) |
| Tea | 475 | (150-855) | 150 | (0.0-475) | 475 | (150-855) | 475 | (81.7-855) | 475 | (190-475) | 475 | (81.7-855) | 475 | (150-855) |
| Alcoholic beverages | 73.9 | (17.5–177) | 53.8 | (8.8–144) | 59.4 | (10.4–177) | 67.1 | (10.4–222) | 55.4 | (10.4–141) | 32.4 | (0.0–127) | 75.3 | (18.2–179) |
| Plasma vitamin C (µmol/l) | 69.4 | (56.1–82.2) | 72.6 | (59.2–87.1) | 64.9 | (49.5–78.5) | 63.2 | (47.3–77.8) | 73.1 | (61.2–85.2) | 67.3 | (53.2–79.7) | 70.9 | (58.4–83.4) |
| \*Variables are presented as median (interquartile range). | | | | | | | | | | | | | | |
| †Five categories; Milk: Non-consumers, 146 g/d, 293 g/d, 439 g/d, 585 or 732 g/d (categories presented: non-consumers and 585-732 g/d); Yoghurt: Non-consumers and quartiles within consumers (1st quartile:8.8-8.8 g/d, 2nd quartile: 17.6 – 35.3 g/d, 3rd quartile: 54.2 – 71.8 g/d, 4th quartile: 99.5 – 1,134 g/d; categories presented: non-consumers and 4th quartile within consumers); Cheese: Non-consumers and quartiles within consumers (1st quartile: 2.4 – 4.8 g/d, 2nd quartile: 6.6 – 13.2 g/d, 3rd quartile: 14.6 – 25.8 g/d, 4th quartile: 26.8 – 284.6 g/d; categories presented: non-consumers and 4th quartile within consumers). Dairy consumption was assessed with a food frequency questionnaire. Milk consumption was assessed with two questions. In the first question, participants could choose the type of milk that they consumed most frequently (options: “Full cream, silver”, “Semi-skimmed, red/white”, “Skimmed/blue”, “Channel Islands, gold”, “Dried milk, “Soya”, “Other”, “None”). In the second question, participants could choose one of six categories for the daily amount of milk consumed [options: “None”, “Quarter of a pint” (146 g/d), “Half a pint” (293 g/d), “Three quarters of a pint” (439 g/d), “One pint” (585 g/d), “More than one pint” (732 g/d)]. Full-fat yoghurt, low-fat yoghurt, high-fat cheese, low-fat cheese, butter, cream and ice-cream were assessed with questions including nine frequencies, which ranged from “Never or less than once/month” to “6+ per day”. | | | | | | | | | | | | | | |

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| Supplemental Table 2. Associations of total and types of dairy products intake with body weight in 12,064 adults of the Fenland Study, the United Kingdom | | | |
|  | BMI (kg/m2), mean (SD)=26.9 (4.8) | | |
| Dairy consumption (servings†/d) | b † | 95% CI | |
| Milk | 0.26\*\* | 0.16 | 0.36 |
| Yoghurt | 0.14 | -0.03 | 0.31 |
| Cheese | 0.06 | -0.15 | 0.27 |
| Fermented dairy products | 0.11 | -0.03 | 0.24 |
| Full-fat milk | -0.13 | -0.31 | 0.05 |
| Low-fat milk | 0.28\*\* | 0.18 | 0.38 |
| Full-fat yoghurt | -0.45\* | -0.85 | -0.06 |
| High-fat cheese | -0.11 | -0.39 | 0.17 |
| Low-fat cheese | 0.28 | -0.03 | 0.59 |
| Butter | 0.15\* | 0.03 | 0.27 |
| Ice-cream | 0.73\* | 0.31 | 1.15 |
| Low-fat fermented dairy products | 0.16\* | 0.01 | 0.31 |
| High-fat dairy products | 0.02 | -0.08 | 0.12 |
| Low-fat dairy products | 0.22\*\* | 0.13 | 0.31 |
| Total dairy products | 0.21\*\* | 0.13 | 0.28 |
| Regression coefficients of the maximally adjusted models were significant: \**P*<0.05, \*\**P*<0.00025 (critical p-value after correction for multiple testing) | | | |
| † Regression coefficients and their 95% CIs are expressed per serving/day (Milk: 1 average glass (200g); Yoghurt: 125g pot; Cheese: medium serving (40g); Single cream: 1 tablespoon (15g); Double cream: 1 tablespoon (30g); Butter: 1 teaspoon (10g); Ice-cream: 1 average scoop/tub (60g)as defined by Food Standards Agency 2002). Models adjusted for age (years), sex, test-site (Cambridge, Ely, Wisbech), ethnicity (white, non-white), total energy intake (kcal/d), mutual adjustment for dairy products, education level (low, medium, high), age when full-time education finished (years), socio-economic status based on occupation (low: technical/semi-routine and routine occupations; medium: lower managerial / intermediate occupations; high: professional/higher managerial occupations), income (<£20,000, £20,000-40,000, >£40,000), marital status (single, married, widowed/separated), smoking status (never, former, current smoker), pack-years of smoking, energy expenditure due to physical activity (kJ/kg per d), lipid-lowering medication (Yes, No), anti-hypertensive medication (Yes, No), hormone-replacement therapy (Yes, No, Men), intakes (g/d) of fruit, vegetables (not including potatoes), potatoes, legumes, processed cereals, whole-grain cereals, poultry and eggs, red meat, processed meat, fish, sauces, margarine, nuts, sweet snacks, sugar-sweetened beverages, artificially sweetened beverages, fruit juice, regular coffee, decaffeinated coffee, tea, alcoholic beverages, plasma vitamin C levels (µmol/l), dietary supplement use (Yes, No). | | | |

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| Supplemental Table 3. Associations of total and types of dairy consumption with adiposity markers after adjustment for dairy nutrients among 12,000 adults in the Fenland Study, the United Kingdom\* | | | | | | | | |
| **Nutrient covariates** | **Low-fat dairy products - VAT/SCAT** † | | | | **Milk - Total lean mass (kg)** † | | |
|  | % change | | 95% CI | | b | 95% CI | |
| Protein | -0.02 | -0.05 | | 0.00 | 0.39 | 0.17 | 0.61 |
| Total sugars | -0.02 | -0.04 | | 0.00 | 0.39 | 0.17 | 0.61 |
| Lactose | -0.03 | -0.05 | | -0.01 | 0.39 | 0.17 | 0.61 |
| Total fat | -0.03 | -0.04 | | -0.02 | 0.38 | 0.23 | 0.53 |
| Saturated fat | -0.03 | -0.04 | | -0.02 | 0.38 | 0.23 | 0.53 |
| Monounsaturated fat | -0.03 | -0.04 | | -0.02 | 0.38 | 0.23 | 0.53 |
| Calcium | -0.03 | -0.05 | | 0.00 | 0.39 | 0.17 | 0.61 |
| Potassium | -0.03 | -0.05 | | 0.00 | 0.38 | 0.16 | 0.60 |
| Magnesium | -0.02 | -0.05 | | 0.00 | 0.38 | 0.16 | 0.60 |
| Phosphorous | -0.03 | -0.05 | | 0.00 | 0.39 | 0.17 | 0.61 |
| Zinc | -0.03 | -0.05 | | 0.00 | 0.39 | 0.17 | 0.61 |
| Selenium | -0.03 | -0.05 | | 0.00 | 0.39 | 0.17 | 0.61 |
| Vitamin A | -0.03 | -0.04 | | -0.02 | 0.38 | 0.23 | 0.53 |
| Vitamin B12 | -0.02 | -0.04 | | 0.00 | 0.39 | 0.17 | 0.61 |
| VAT, Visceral Adipose Tissue; SCAT, Subcutaneous Adipose Tissue | | | | | | | | |
| \*Significant associations were selected after False Discovery Rate correction ; Serving sizes as defined by the Food Standards Agency 2002: Milk: 1 average glass (200g); Yoghurt: 125g pot; Cheese: medium serving (40g); Single cream: 1 tablespoon (15g); Double cream: 1 tablespoon (30g); Butter: 1 teaspoon (10g); Ice-cream: 1 average scoop/tub (60g) ; Dairy nutrients intakes were calculated from the food frequency questionnaire using in-house software | | | | | | | | |
| † Body fat and lean mass were estimated with dual energy X-ray absorptiometry. Sample sizes varied by the availability: 11,253 for VAT/SCAT and 11,523 for total lean mass. | | | | | | | | |

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Supplemental Figure 1. Associations of types of dairy consumption (servings/d) with visceral (VAT) and subcutaneous (SCAT) adipose tissue estimated with dual energy X-ray absorptiometry (DEXA) among over 12,000 adults in the Fenland Study, UK. Forest plots represent regression coefficients with their 95% CIs. Associations were adjusted for age (years), sex, test-site (Cambridge, Ely, Wisbech), ethnicity (white, non-white), total energy intake (kcal/d), other dairy types, educational level (low, medium, high), age when full-time education finished (years), socio-economic status based on occupation (low, medium, high), income (<£20,000, £20,000-40,000, >£40,000), marital status (single, married, widowed/separated), smoking status (never, former, current smoker), pack-years of smoking, energy expenditure due to physical activity (kJ/kg per d), lipid-lowering medication (Yes, No), anti-hypertensive medication (Yes, No), hormone-replacement therapy (Yes, No, Men), intakes (g/d) of fruit, vegetables (not including potatoes), potatoes, legumes, processed cereals, whole-grain cereals, poultry and eggs, red meat, processed meat, fish, sauces, margarine, nuts, sweet snacks, sugar-sweetened beverages, artificially sweetened beverages, fruit juice, regular coffee, decaffeinated coffee, tea and alcoholic beverages, plasma vitamin C levels (µmol/l), dietary supplement use (Yes, No), and BMI (kg/m2). Statistically significant associations after false discovery rate corrections are marked with an asterisk. Dairy consumption was derived from a food frequency questionnaire. Dairy types were categorised into groups as shown in Table 1. DEXA: Dual Energy X-ray Absorptiometry; SCAT: Subcutaneous Adipose Tissue; VAT: Visceral Adipose Tissue