**Online Supplementary Material**

**Substitutions between dairy products and risk of stroke: Results from the EPIC-NL cohort**

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**Supplementary table 1. Participant Characteristics Across Quintiles of Whole-Fat Milk Intake in the EPIC-NL Cohort.**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Quintiles of whole-fat milk** | | | | |
|  | **Q1** | **Q2** | **Q3** | **Q4** | **Q5** |
| Total stroke (n) | 173 | 166 | 184 | 197 | 164 |
| Sex, men (%) | 20.0 | 24.9 | 22.4 | 24.8 | 34.8 |
| Age (years) | 52.3  (35.1 ; 63.5) | 51.2  (31.4 ; 63.0) | 51.6  (31.6 ; 64.1) | 51.6  (31.1 ; 63.8) | 50.1  (27.6 ; 63.0) |
| Body mass index (kg/m2) | 25.3  (21.2 ; 31.3) | 25.1  (21.2 ; 30.7) | 25.3  (21.3 ; 30.7) | 25.2  (21.3 ; 30.7) | 24.9  (20.8 ; 30.6) |
| Waist circumference (cm) |  |  |  |  |  |
| Men | 93.2  (80.0 ; 107.4) | 92.0  (79.5 ; 106.0) | 92.0  (79.0 ; 105.0) | 92.0  (79.8 ; 106.5) | 90.9  (78.3 ; 106.3) |
| Women | 81.9  (70.0 ; 98.0) | 81.0  (70.0 ; 96.0) | 82.0  (70.4 ; 97.0) | 82.0  (71.0 ; 96.5) | 81.3  (70.5 ; 97.0) |
| Low educational attainment (%) | 58.8 | 57.0 | 58.8 | 58.4 | 56.4 |
| Current smoker (%) | 28.3 | 30.2 | 28.9 | 28.8 | 35.4 |
| Physically inactive | 8.3 | 7.2 | 7.1 | 6.8 | 7.6 |
| Alcohol consumption (g/day) | 6.1  (0.01 ; 32.7) | 5.3  (0.02 ; 30.3) | 5.1  (0.02 ; 29.4) | 4.5  (0.02 ; 28.7) | 4.3  (0.01 ; 30.3) |
| Hypertension (%) | 40.7 | 37.0 | 37.6 | 37.2 | 33.7 |
| Hypercholesterolemia (%) | 8.7 | 9.3 | 8.2 | 8.9 | 7.2 |
| Diabetes (%) | 1.5 | 1.2 | 1.3 | 1.8 | 1.5 |
| Prevalent myocardial infarction (%) | 1.3 | 1.1 | 1.2 | 1.4 | 1.4 |
| **Habitual food consumption (servings/day)** |  |  |  |  |  |
| Total dairy | 3.22  (1.19 ; 6.25) | 3.39  (1.52 ; 6.25) | 3.75  (2.00 ; 6.45) | 4.35  (2.59 ; 7.13) | 5.41  (3.12 ; 8.95) |
| Low-fat milk | 0.05  (0.00 ; 0.18) | 0.24  (0.07 ; 0.50) | 0.77  (0.19 ; 0.95) | 1.19  (0.31 ; 1.70) | 1.36  (0.24 ; 3.02) |
| Whole-fat milk | 0.01  (0.00 ; 0.03) | 0.07  (0.04 ; 0.10) | 0.15  (0.12 ; 0.19) | 0.28  (0.21 ; 0.34) | 0.59  (0.39 ; 1.54) |
| Buttermilk | 0.00  (0.00 ; 2.00) | 0.00  (0.00 ; 2.00) | 0.00  (0.00 ; 1.00) | 0.00  (0.00 ; 1.00) | 0.00  (0.00 ; 1.00) |
| Low-fat yoghurt | 0.11  (0.00 ; 0.64) | 0.15  (0.01 ; 0.68) | 0.16  (0.01 ; 0.67) | 0.17  (0.02 ; 0.71) | 0.15  (0.01 ; 0.67) |
| Whole-fat yoghurt | 0.03  (0.00 ; 0.24) | 0.05  (0.00 ; 0.27) | 0.05  (0.01 ; 0.27) | 0.07  (0.01 ; 0.29) | 0.07  (0.01 ; 0.31) |
| Cheese | 1.54  (0.32 ; 3.51) | 1.5  (0.33 ; 3.38) | 1.46  (0.42 ; 3.30) | 1.50  (0.43 ; 3.29) | 1.50  (0.33 ; 3.50) |
| Butter | 0.40  (0.08 ; 1.91) | 0.44  (0.12 ; 1.89) | 0.44  (0.12 ; 1.79) | 0.46  (0.13 ; 1.86) | 0.56  (0.15 ; 2.75) |
| Fruit | 2.43  (0.72 ; 4.94) | 2.37  (0.71 ; 4.67) | 2.43  (0.83 ; 4.69) | 2.49  (0.89 ; 4.78) | 2.30  (0.72 ; 4.76) |
| Vegetables | 1.10  (0.62 ; 1.80) | 1.08  (0.63 ; 1.73) | 1.08  (0.65 ; 1.73) | 1.08  (0.66 ; 1.71) | 1.08  (0.62 ; 1.73) |
| Fresh red meat | 0.40  (0.10 ; 0.70) | 0.40  (0.11 ; 0.70) | 0.41  (0.12 ; 0.69) | 0.40  (0.12 ; 0.67) | 0.42  (0.11 ; 0.72) |
| Processed red meat | 1.29  (0.13 ; 4.07) | 1.31  (0.19 ; 4.01) | 1.37  (0.23 ; 3.97) | 1.37  (0.24 ; 3.94) | 1.57  (0.20 ; 4.40) |
| Fish | 0.05  (0.00 ; 0.13) | 0.05  (0.00 ; 0.13) | 0.06  (0.01 ; 0.13) | 0.06  (0.00 ; 0.13) | 0.06  (0.00 ; 0.13) |

Q: quintile. Median (80 % central range) unless otherwise indicated.

**Supplementary table 2. Participant Characteristics Across Quintiles of Buttermilk Intake in the EPIC-NL Cohort.**

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| --- | --- | --- | --- | --- |
|  | **Quintilesa of buttermilk** | | | |
|  | **Q1** | **Q3** | **Q4** | **Q5** |
| Total stroke (n) | 453 | 58 | 173 | 200 |
| Sex, men (%) | 31.7 | 25.6 | 22.1 | 11.8 |
| Age (years) | 50.1  (28.2 ; 62.7) | 50.3  (29 ; 61.5) | 51.8  (32.5 ; 63.2) | 55.0  (40.2 ; 65.4) |
| Body mass index (kg/m2) | 25.1  (21.1 ; 30.7) | 24.6  (21.0 ; 29.8) | 25.3  (21.3 ; 31.0) | 25.4  (21.5 ; 31.2) |
| Waist circumference (cm) |  |  |  |  |
| Men | 91.5  (78.5 ; 106.0) | 90.5  (78.6 ; 106.8) | 93.0  (80.0 ; 107.0) | 94.0  (81.5 ; 107.0) |
| Women | 81.0  (69.8 ; 96.0) | 80.0  (70.0 ; 95.0) | 82.0  (71.0 ; 97.5) | 83.0  (72.0 ; 98) |
| Low educational attainment (%) | 57.8 | 51.6 | 56.6 | 61.7 |
| Current smoker (%) | 33.7 | 32.6 | 29.2 | 21.6 |
| Physically inactive | 8.8 | 6.2 | 5.9 | 5.8 |
| Alcohol consumption (g/day) | 4.6  (0.01 ; 30.8) | 5.8  (0.07 ; 32.5) | 5.8  (0.04 ; 30.6) | 4.9  (0.02 ; 27.1) |
| Hypertension (%) | 35.8 | 32.5 | 37.6 | 42.5 |
| Hypercholesterolemia (%) | 9.1 | 7.9 | 8.0 | 7.5 |
| Diabetes (%) | 1.3 | 0.9 | 1.6 | 2.1 |
| Prevalent myocardial infarction (%) | 1.4 | 1.2 | 1.3 | 1.1 |
| **Habitual food consumption (servings/day)** |  |  |  |  |
| Total dairy | 3.55  (1.52 ; 6.68) | 3.77  (1.82 ; 7.06) | 4.24  (2.27 ; 7.24) | 5.00  (3.04 ; 8.10) |
| Low-fat milk | 0.48  (0.04 ; 1.73) | 0.61  (0.07 ; 1.74) | 0.65  (0.079 ; 1.86) | 0.25  (0.03 ; 1.42) |
| Whole-fat milk | 0.16  (0.01 ; 0.62) | 0.18  (0.02 ; 0.65) | 0.19  (0.02 ; 0.65) | 0.09  (0.00 ; 0.38) |
| Buttermilk | 0.00  (0.00 ; 0.00) | 0.03  (0.01 ; 0.03) | 0.17  (0.05 ; 0.57) | 1.00  (1.00 ; 2.00) |
| Low-fat yoghurt | 0.11  (0.01 ; 0.62) | 0.13  (0.01 ; 0.57) | 0.19  (0.02 ; 0.70) | 0.23  (0.02 ; 0.83) |
| Whole-fat yoghurt | 0.04  (0.00 ; 0.25) | 0.06  (0.01 ; 0.28) | 0.07  (0.01 ; 0.28) | 0.08  (0.01 ; 0.33) |
| Cheese | 1.37  (0.28 ; 3.32) | 1.44  (0.42 ; 3.50) | 1.57  (0.50 ; 3.48) | 1.69  (0.57 ; 3.40) |
| Butter | 0.46  (0.12 ; 2.05) | 0.50  (0.12 ; 2.35) | 0.49  (0.12 ; 2.16) | 0.40  (0.10 ; 1.83) |
| Fruit | 2.13  (0.60 ; 4.57) | 2.14  (0.73 ; 4.55) | 2.48  (0.94 ; 4.82) | 2.83  (1.24 ; 5.09) |
| Vegetables | 1.04  (0.59 ; 1.69) | 1.07  (0.63 ; 1.72) | 1.12  (0.68 ; 1.77) | 1.17  (0.74 ; 1.84) |
| Fresh red meat | 0.43  (0.12 ; 0.73) | 0.40  (0.10 ; 0.69) | 0.39  (0.11 ; 0.67) | 0.35  (0.10 ; 0.63) |
| Processed red meat | 1.57  (0.20 ; 4.33) | 1.25  (0.16 ; 3.9) | 1.33  (0.25 ; 3.97) | 1.18  (0.16 ; 3.29) |
| Fish | 0.05  (0.00 ; 0.13) | 0.05  (0.01 ; 0.13) | 0.06  (0.01 ; 0.13) | 0.06  (0.01 ; 0.14) |

Q: quintile. Median (80 % central range) unless otherwise indicated. aA large proportion of the participants do not consume buttermilk, thus the first quintile includes more than 1/5 of the participants, yielding only four groups.

**Supplementary table 3. Participant Characteristics Across Quintiles of Low-Fat Yoghurt Intake in the EPIC-NL Cohort.**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Quintiles of low-fat yoghurt** | | | | |
|  | **Q1** | **Q2** | **Q3** | **Q4** | **Q5** |
| Total stroke (n) | 199 | 180 | 168 | 156 | 181 |
| Sex, men (%) | 31.3 | 30.5 | 26.1 | 21.9 | 17.0 |
| Age (years) | 51.1  (32.5 ; 62.8) | 50.8  (31.3 ; 63.0) | 50.8  (29.2 ; 63.2) | 51.7  (29.5 ; 63.6) | 52.6  (30.6 ; 64.7) |
| Body mass index (kg/m2) | 25.3  (21.2 ; 31.3) | 25.2  (21.1 ; 30.8) | 25.0  (21.1 ; 30.6) | 25.0  (21.2 ; 30.4) | 25.2  (21.3 ; 30.9) |
| Waist circumference (cm) |  |  |  |  |  |
| Men | 93.0  (79.8 ; 108.0) | 92.3  (79.5 ; 105.5) | 91.5  (78.5 ; 106.0) | 91.0  (78.8 ; 105.5) | 91.0  (78.5 ; 106.3) |
| Women | 81.5  (70.0 ; 98.0) | 81.5  (70.0 ; 97.0) | 81.0  (70.0 ; 96.5) | 81.0  (70.4 ; 96.0) | 82.0  (70.8 ; 97.0) |
| Low educational attainment (%) | 61.5 | 58.0 | 55.2 | 56.0 | 58.6 |
| Current smoker (%) | 43.2 | 33.1 | 28.2 | 23.6 | 23.3 |
| Physically inactive | 11.4 | 7.9 | 6.5 | 5.2 | 6.2 |
| Alcohol consumption (g/day) | 8.1  (0.01 ; 41.3) | 5.5  (0.02 ; 31.3) | 4.9  (0.03 ; 28.7) | 4.4  (0.03 ; 24.2) | 3.8  (0.01 ; 23.5) |
| Hypertension (%) | 39.2 | 35.8 | 36.5 | 36.1 | 38.6 |
| Hypercholesterolemia (%) | 10.1 | 8.7 | 7.3 | 7.6 | 8.6 |
| Diabetes (%) | 1.7 | 1.3 | 1.2 | 1.3 | 1.9 |
| Prevalent myocardial infarction (%) | 1.8 | 1.2 | 0.9 | 1.2 | 1.4 |
| **Habitual food consumption (servings/day)** |  |  |  |  |  |
| Total dairy | 3.29  (1.20 ; 6.62) | 3.81  (1.71 ; 7.01) | 4.06  (2.03 ; 7.17) | 4.17  (2.23 ; 7.06) | 4.65  (2.57 ; 7.86) |
| Low-fat milk | 0.26  (0.01 ; 1.55) | 0.46  (0.05 ; 1.68) | 0.56  (0.08 ; 1.77) | 0.60  (0.07 ; 1.79 | 0.48  (0.06 ; 1.74) |
| Whole-fat milk | 0.11  (0.00 ; 0.58) | 0.16  (0.01 ; 0.65) | 0.17  (0.02 ; 0.65) | 0.16  (0.01 ; 0.55) | 0.16  (0.01 ; 0.52) |
| Buttermilk | 0.00  (0.00 ; 1.00) | 0.00  (0.00 ; 1.00) | 0.01  (0.00 ; 1.00) | 0.03  (0.00 ; 1.29) | 0.03  (0.00 ; 2.00) |
| Low-fat yoghurt | 0.01  (0.00 ; 0.03) | 0.06  (0.04 ; 0.09) | 0.15  (0.11 ; 0.20) | 0.30  (0.23 ; 0.40) | 0.68  (0.46 ; 1.49) |
| Whole-fat yoghurt | 0.01  (0.00 ; 0.04) | 0.05  (0.01 ; 0.29) | 0.10  (0.02 ; 0.38) | 0.09  (0.03 ; 0.28) | 0.08  (0.03 0.31) |
| Cheese | 1.30  (0.21 ; 3.50) | 1.46  (0.35 ; 3.35) | 1.51  (0.41 ; 3.36) | 1.55  (0.48 ; 3.30) | 1.57  (0.45 ; 3.45) |
| Butter | 0.48  (0.11 ; 2.40) | 0.53  (0.14 ; 2.40) | 0.49  (0.13 ; 2.17) | 0.43  (0.12 ; 1.68) | 0.37  (0.09 ; 1.55) |
| Fruit | 1.80  (0.39 ; 4.50) | 2.11  (0.67 ; 4.45) | 2.40  (0.84 ; 4.64) | 2.57  (1.08 ; 4.84) | 2.80  (1.22 ; 5.13) |
| Vegetables | 1.03  (0.56 ; 1.72) | 1.06  (0.61 ; 1.68) | 1.08  (0.66 ; 1.69) | 1.11  (0.67 ; 1.74) | 1.16  (0.70 ; 1.85) |
| Fresh red meat | 0.44  (0.11 ; 0.74) | 0.43  (0.13 ; 0.72) | 0.40  (0.11 ; 0.68) | 0.39  (0.11 ; 0.68) | 0.37  (0.10 ; 0.65) |
| Processed red meat | 1.77  (0.20 ; 4.74) | 1.57  (0.27 ; 4.40) | 1.36  (0.20 ; 3.97) | 1.28  (0.19 ; 3.84) | 1.17  (0.13 ; 3.58) |
| Fish | 0.05  (0.00 ; 0.13) | 0.05  (0.00 ; 0.13) | 0.05  (0.01 ; 0.13) | 0.06  (0.01; 0.13) | 0.06  (0.00 ; 0.14) |

Q: quintile. Median (80 % central range) unless otherwise indicated.

**Supplementary table 4. Participant Characteristics Across Quintiles of Whole-Fat Yoghurt Intake in the EPIC-NL Cohort.**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Quintiles of whole-fat yoghurt** | | | | |
|  | **Q1** | **Q2** | **Q3** | **Q4** | **Q5** |
| Total stroke (n) | 197 | 188 | 194 | 137 | 168 |
| Sex, men (%) | 30.3 | 28.0 | 23.2 | 25.6 | 19.8 |
| Age (years) | 51.0  (31.8 ; 62.8) | 50.9  (29.2 ; 62.8) | 51.9  (30.9 ; 64.3) | 50.5  (28.6 ; 62.5) | 52.7  (33.1 ; 64.8) |
| Body mass index (kg/m2) | 25.5  (21.3 ; 31.4) | 25.5  (21.4 ; 31.2) | 25.3  (21.3 ; 30.9) | 24.8  (21.0 ; 30.3) | 24.7  (20.9 ; 29.9) |
| Waist circumference (cm) |  |  |  |  |  |
| Men | 93.5  (79.8 ; 108.0) | 92.5  (79.7 ; 107.3) | 92.0  (79.0 ; 106.0) | 90.5  (78.3 ; 105.0) | 90.1  (78.5 ; 104.0) |
| Women | 82.0  (70.0 ; 98.0) | 82.0  (70.3 ; 98.0) | 82.0  (70.3 ; 97.0) | 80.8  (70.0 ; 95.5) | 81.0  (71.0 ; 96.0) |
| Low educational attainment (%) | 62.8 | 60.4 | 58.9 | 52.0 | 55.3 |
| Current smoker (%) | 42.9 | 32.9 | 26.9 | 27.4 | 21.5 |
| Physically inactive | 11.6 | 8.0 | 6.8 | 5.4 | 5.2 |
| Alcohol consumption (g/day) | 7.5  (0.01 ; 40.9) | 4.8  (0.02 ; 31.0) | 4.5  (0.02 ; 27.9) | 5.2  (0.04 ; 26.0) | 4.1  (0.02 ; 23.5) |
| Hypertension (%) | 39.5 | 37.8 | 36.9 | 34.8 | 37.2 |
| Hypercholesterolemia (%) | 10.4 | 9.0 | 8.2 | 7.9 | 6.7 |
| Diabetes (%) | 2.0 | 1.1 | 1.6 | 1.0 | 1.6 |
| Prevalent myocardial infarction (%) | 2.0 | 1.3 | 1.2 | 1.0 | 1.0 |
| **Habitual food consumption (servings/day)** |  |  |  |  |  |
| Total dairy | 3.25  (1.20 ; 6.53) | 3.70  (1.70 ; 6.79) | 4.04  (2.03 ; 7.02) | 4.27  (2.26 ; 7.33) | 4.72  (2.66 ; 7.87) |
| Low-fat milk | 0.24  (0.00 ; 1.55) | 0.42  (0.04 ; 1.67) | 0.52  (0.06 ; 1.73) | 0.60  (0.10 ; 1.80) | 0.57  (0.08 ; 1.81) |
| Whole-fat milk | 0.10  (0.00 ; 0.52) | 0.15  (0.01 ; 0.55) | 0.16  (0.01 ; 0.54) | 0.18  (0.02 ; 0.62) | 0.18  (0.02 ; 0.68) |
| Buttermilk | 0.00  (0.00 ; 1.00) | 0.00  (0.00 ; 1.00) | 0.00  (0.00 ; 1.00) | 0.03  (0.00 ; 1.00) | 0.03  (0.00 ; 2.00) |
| Low-fat yoghurt | 0.01  (0.00 ; 0.15) | 0.13  (0.03 ; 0.49) | 0.26  (0.04 ; 0.72) | 0.22  (0.06 ; 0.82) | 0.21  (0.07 ; 1.03) |
| Whole-fat yoghurt | 0.00  (0.00 ; 0.01) | 0.02  (0.02 ; 0.03) | 0.05  (0.04 ; 0.07) | 0.12  (0.09 ; 0.17) | 0.28  (0.20 ; 0.48) |
| Cheese | 1.29  (0.21 ; 3.45) | 1.43  (0.36 ; 3.29) | 1.50  (0.41 ; 3.33) | 1.52  (0.43 ; 3.38) | 1.71  (0.51 ; 3.49) |
| Butter | 0.44  (0.10 ; 2.15) | 0.46  (0.12 ; 2.13) | 0.44  (0.11 ; 1.83) | 0.48  (0.13 ; 2.03) | 0.47  (0.14 ; 2.13) |
| Fruit | 1.85  (0.39 ; 4.54) | 2.20  (0.68 ; 4.60) | 2.47  (0.90 ; 4.77) | 2.51  (0.95 ; 4.80) | 2.67  (1.18 ; 5.01) |
| Vegetables | 1.04  (0.56 ; 1.77) | 1.05  (0.61 ; 1.70) | 1.10  (0.65 ; 1.73) | 1.10  (0.67 ; 1.72) | 1.14  (0.71 ; 1.77) |
| Fresh red meat | 0.44  (0.10 ; 0.75) | 0.42  (0.13 ; 0.71) | 0.40  (0.11 ; 0.68) | 0.40  (0.11 ; 0.68) | 0.37  (0.10 ; 0.65) |
| Processed red meat | 1.65  (0.18 ; 4.67) | 1.51  (0.27 ; 4.31) | 1.32  (0.19 ; 3.96) | 1.37  (0.21 ; 3.99) | 1.18  (0.15 ; 3.58) |
| Fish | 0.05  (0.00 ; 0.13) | 0.05  (0.00 ; 0.13) | 0.06  (0.00 ; 0.13) | 0.06  (0.01 ; 0.13) | 0.06  (0.01 ; 0.13) |

Q: quintile. Median (80 % central range) unless otherwise indicated.

**Supplementary table 5. Participant Characteristics Across Quintiles of Cheese Intake in the EPIC-NL Cohort.**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Quintiles of cheese** | | | | |
|  | **Q1** | **Q2** | **Q3** | **Q4** | **Q5** |
| Total stroke (n) | 187 | 188 | 170 | 160 | 179 |
| Sex, men (%) | 29.8 | 22.4 | 22.9 | 21.5 | 30.3 |
| Age (years) | 49.8  (26.6 ; 62.7) | 52.1  (31.7 ; 64.7) | 51.7  (32.3 ; 63.1) | 52.6  (33.8 ; 64.6) | 50.8  (32.0 ; 61.9) |
| Body mass index (kg/m2) | 25.1  (21.0 ; 30.7) | 25.3  (21.3 ; 30.9) | 25.2  (21.3 ; 30.7) | 25.2  (21.2 ; 30.7) | 25.0  (21.1 ; 30.8) |
| Waist circumference (cm) |  |  |  |  |  |
| Men | 91.3  (78.0 ; 106.0) | 92.0  (79.5 ; 105.5) | 92.8  (80.0 ; 106.0) | 92.0  (79.3 ; 106.8) | 92.0  (79.0 ; 106.7) |
| Women | 80.8  (70.0 ; 96.5) | 82.0  (70.8 ; 97.0) | 81.5  (70.5 ; 97.0) | 82.0  (71.0 ; 97.0) | 80.9  (70.0 ; 97.0) |
| Low educational attainment (%) | 60.8 | 62.9 | 56.9 | 57.8 | 51.1 |
| Current smoker (%) | 34.4 | 29.3 | 29.9 | 26.8 | 31.2 |
| Physically inactive | 9.7 | 8.4 | 6.7 | 6.4 | 5.8 |
| Alcohol consumption (g/day) | 3.0  (0.01 ; 29.8) | 3.6  (0.01 ; 28.0) | 6.2  (0.04 ; 30.9) | 5.0  (0.02 ; 28.7) | 7.5  (0.03 ; 33.2) |
| Hypertension (%) | 35.4 | 39.4 | 36.9 | 39.8 | 34.8 |
| Hypercholesterolemia (%) | 9.5 | 9.2 | 8.3 | 7.8 | 7.4 |
| Diabetes (%) | 1.3 | 1.5 | 1.6 | 1.7 | 1.3 |
| Prevalent myocardial infarction (%) | 1.6 | 1.5 | 1.0 | 1.3 | 1.0 |
| **Habitual food consumption (servings/day)** |  |  |  |  |  |
| Total dairy | 2.33  (0.91 ; 4.76) | 3.19  (1.83 ; 5.46) | 3.78  (2.38 ; 6.12) | 4.63  (3.14 ; 6.99) | 6.17  (4.20 ; 9.66) |
| Low-fat milk | 0.41  (0.04 ; 1.70) | 0.50  (0.05 ; 1.71) | 0.47  (0.05 ; 1.69) | 0.51  (0.05 ; 1.71) | 0.42  (0.04 ; 1.74) |
| Whole-fat milk | 0.15  (0.01 ; 0.63) | 0.16  (0.01 ; 0.57) | 0.15  (0.01 ; 0.58) | 0.16  (0.01 ; 0.55) | 0.15  (0.00 ; 0.63) |
| Buttermilk | 0.00  (0.00 ; 1.00) | 0.00  (0.00 ; 1.00) | 0.01  (0.00 ; 1.00) | 0.03  (0.00 ; 1.50) | 0.00  (0.00 ; 1.00) |
| Low-fat yoghurt | 0.11  (0.01 ; 1.60) | 0.15  (0.01 ; 0.63) | 0.16  (0.01 ; 0.68) | 0.18  (0.02 ; 0.76) | 0.14  (0.01 ; 0.73) |
| Whole-fat yoghurt | 0.04  (0.00 ; 0.24) | 0.05  (0.00 ; 0.27) | 0.06  (0.01 ; 0.28) | 0.06  (0.01 ; 0.31) | 0.05  (0.00 ; 0.29) |
| Cheese | 0.36  (0.00 ; 0.64) | 1.02  (0.79 ; 1.14) | 1.5  (1.21 ; 1.93) | 2.16  (2.01 ; 2.5) | 3.38  (2.90 ; 5.49) |
| Butter | 0.41  (0.10 ; 1.81) | 0.43  (0.12 ; 1.85) | 0.46  (0.12 ; 2.06) | 0.46  (0.13 ; 2.02) | 0.53  (0.11 ; 2.48) |
| Fruit | 1.98  (0.54 ; 4.55) | 2.35  (0.79 ; 4.56) | 2.47  (0.85 ; 4.76) | 2.54  (0.96 ; 4.87) | 2.49  (0.82 ; 4.97) |
| Vegetables | 1.03  (0.57 ; 1.71) | 1.07  (0.63 ; 1.70) | 1.09  (0.66 ; 1.73) | 1.11  (0.68 ; 1.77) | 1.12  (0.66 ; 1.78) |
| Fresh red meat | 0.43  (0.11 ; 0.74) | 0.41  (0.14 ; 0.68) | 0.41  (0.11 ; 0.69) | 0.39  (0.11 ; 0.66) | 0.39  (0.08 ; 0.71) |
| Processed red meat | 1.41  (0.20 ; 4.42) | 1.30  (0.28 ; 3.83) | 1.54  (0.27 ; 4.00) | 1.29  (0.17 ; 3.74) | 1.33  (0.11 ; 4.49) |
| Fish | 0.05  (0.00 ; 0.13) | 0.05  (0.00 ; 0.13) | 0.06  (0.01 ; 0.13) | 0.06  (0.00 ; 0.13) | 0.06  (0.00 ; 0.13) |

Q: quintile. Median (80 % central range) unless otherwise indicated.

**Supplementary table 6. Participant Characteristics Across Quintiles of Butter Intake in the EPIC-NL Cohort.**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Quintiles of butter** | | | | |
|  | **Q1** | **Q2** | **Q3** | **Q4** | **Q5** |
| Total stroke (n) | 156 | 181 | 201 | 171 | 175 |
| Sex, men (%) | 14.8 | 17.7 | 27.3 | 35.7 | 31.4 |
| Age (years) | 51.2  (27.7 ; 63.1) | 51.7  (29.8 ; 64.2) | 51.6  (31.9 ; 64.1) | 50.7  (31.4 ; 62.8) | 52.0  (33.1 ; 63.3) |
| Body mass index (kg/m2) | 25.2  (21.3 ; 31.1) | 25.3  (21.3 ; 31.0) | 25.2  (21.3 ; 30.8) | 25.1  (21.2 ; 30.7) | 24.7  (20.9 ; 30.3) |
| Waist circumference (cm) |  |  |  |  |  |
| Men | 91.8  (78.3 ; 106.0) | 92.3  (80.0 ; 106.0) | 92.3  (79.0 ; 106.8) | 92.0  (79.5 ; 106.0) | 91.3  (79.0 ; 106.3) |
| Women | 81.0  (70.0 ; 96.5) | 82.0  (71.0 ; 97.0) | 82.0  (71.0 ; 98.0) | 81.0  (70.3 ; 96.5) | 80.0  (70.0 ; 96.0) |
| Low educational attainment (%) | 56.1 | 61.3 | 63.6 | 57.1 | 51.3 |
| Current smoker (%) | 25.1 | 25.9 | 29.8 | 33.7 | 37.1 |
| Physically inactive | 6.9 | 6.9 | 7.5 | 7.6 | 8.1 |
| Alcohol consumption (g/day) | 4.1  (0.01 ; 26.3) | 3.5  (0.01 ; 26.2) | 4.1  (0.01 ; 28.7) | 5.9  (0.03 ; 32.2) | 8.5  (0.1 ; 35.8) |
| Hypertension (%) | 37.6 | 39.8 | 39.2 | 35.4 | 34.1 |
| Hypercholesterolemia (%) | 9.0 | 9.2 | 9.4 | 8.8 | 5.9 |
| Diabetes (%) | 1.4 | 1.9 | 1.7 | 1.4 | 1.0 |
| Prevalent myocardial infarction (%) | 1.5 | 1.3 | 1.5 | 1.3 | 0.8 |
| **Habitual food consumption (servings/day)** |  |  |  |  |  |
| Total dairy | 3.31  (1.34 ; 5.97) | 3.49  (1.60 ; 5.93) | 3.73  (1.79 ; 6.32) | 4.13  (2.14 ; 6.85) | 5.78  (3.36 ; 9.37) |
| Low-fat milk | 0.39  (0.03 ; 1.71) | 0.50  (0.05 ; 1.71) | 0.54  (0.06 ; 1.74) | 0.48  (0.06 ; 1.73) | 0.40  (0.05 ; 1.64) |
| Whole-fat milk | 0.13  (0.00 ; 0.46) | 0.15  (0.01 ; 0.49) | 0.16  (0.01 ; 0.56) | 0.16  (0.01 ; 0.65) | 0.17  (0.01 ; 0.81) |
| Buttermilk | 0.00  (0.00 ; 1.00) | 0.00  (0.00 ; 1.00) | 0.00  (0.00 ; 1.00) | 0.00  (0.00 ; 1.00) | 0.00  (0.00 ; 1.00) |
| Low-fat yoghurt | 0.19  (0.01 ; 0.85) | 0.17  (0.01 ; 0.74) | 0.14  (0.01 ; 0.65) | 0.13  (0.01 ; 0.59) | 0.11  (0.01 ; 0.55) |
| Whole-fat yoghurt | 0.05  (0.00 ; 0.26) | 0.05  (0.00 ; 0.29) | 0.05  (0.00 ; 0.29) | 0.05  (0.00 ; 0.27) | 0.06  (0.00 ; 0.28) |
| Cheese | 1.37  (0.30 ; 3.29) | 1.34  (0.35 ; 3.15) | 1.50  (0.35 ; 3.29) | 1.58  (0.41 ; 3.50) | 1.66  (0.44 ; 3.78) |
| Butter | 0.12  (0.03 ; 0.19) | 0.28  (0.22 ; 0.35) | 0.46  (0.38 ; 0.55) | 0.77  (0.61 ; 1.04) | 2.06  (1.26 ; 4.39) |
| Fruit | 2.59  (0.96 ; 5.02) | 2.48  (0.86 ; 4.83) | 2.34  (0.71 ; 4.58) | 2.23  (0.65 ; 4.59) | 2.22  (0.74 ; 4.66) |
| Vegetables | 1.09  (0.61 ; 1.83) | 1.07  (0.61 ; 1.72) | 1.08  (0.64 ; 1.69) | 1.08  (0.65 ; 1.72) | 1.12  (0.66 ; 1.75) |
| Fresh red meat | 0.32  (0.07 ; 0.63) | 0.38  (0.12 ; 0.65) | 0.43  (0.13 ; 0.70) | 0.46  (0.14 ; 0.74) | 0.43  (0.12 ; 0.73) |
| Processed red meat | 1.02  (0.07 ; 3.23) | 1.18  (0.18 ; 3.37) | 1.51  (0.27 ; 4.00) | 1.88  (0.31 ; 4.67) | 1.77  (0.25 ; 4.73) |
| Fish | 0.06  (0.00 ; 0.14) | 0.05  (0.00 ; 0.13) | 0.05  (0.00 ; 0.13) | 0.05  (0.00 ; 0.13) | 0.06  (0.01 ; 0.13) |

Q: quintile. Median (80 % central range) unless otherwise indicated.

**Supplementary table 7. Associations for 1 Serving/Day Substitutions Between Dairy Products and Risk of Total Stroke in the EPIC-NL Cohort.**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Substitution** | **Model 1** | | **Model 2** | | **Model 3** | | | **Model 4** | | |
|  | **HR** | **95 % CI** | **HR** | **95 % CI** | | **HR** | **95 % CI** | | **HR** | **95 % CI** | |
| **Low-fat yoghurt for** |  |  |  |  | |  |  | |  |  | |
| Whole-fat yoghurt | 1.97 | 1.08,3.59 | 1.53 | 0.85,2.76 | | 1.43 | 0.80,2.58 | | 1.32 | 0.73,2.36 | |
| Low-fat milk | 0.86 | 0.70,1.06 | 0.90 | 0.74,1.10 | | 0.91 | 0.75,1.11 | | 0.91 | 0.75,1.11 | |
| Whole-fat milk | 0.80 | 0.63,1.03 | 0.93 | 0.72,1.19 | | 0.94 | 0.74,1.21 | | 0.90 | 0.70,1.16 | |
| Buttermilk | 0.90 | 0.73,1.11 | 0.93 | 0.76,1.14 | | 0.94 | 0.76,1.15 | | 0.93 | 0.76,1.14 | |
| Cheese | 0.88 | 0.73,1.06 | 0.92 | 0.76,1.10 | | 0.93 | 0.77,1.12 | | 0.91 | 0.76,1.10 | |
| Butter | 0.86 | 0.71,1.04 | 0.93 | 0.77,1.11 | | 0.95 | 0.79,1.13 | | 0.91 | 0.76,1.10 | |
| **Whole-fat yoghurt for** |  |  |  |  | |  |  | |  |  | |
| Low-fat milk | 0.44 | 0.25,0.77 | 0.59 | 0.34,1.02 | | 0.64 | 0.37,1.11 | | 0.69 | 0.40,1.20 | |
| Whole-fat milk | 0.41 | 0.23,0.73 | 0.60 | 0.34,1.08 | | 0.66 | 0.37,1.18 | | 0.68 | 0.39,1.22 | |
| Buttermilk | 0.45 | 0.26,0.80 | 0.61 | 0.35,1.06 | | 0.65 | 0.37,1.14 | | 0.70 | 0.41,1.22 | |
| Cheese | 0.45 | 0.26,0.78 | 0.60 | 0.35,1.03 | | 0.65 | 0.38,1.12 | | 0.69 | 0.40,1.19 | |
| Butter | 0.44 | 0.25,0.76 | 0.60 | 0.35,1.04 | | 0.66 | 0.38,1.14 | | 0.69 | 0.40,1.19 | |
| **Low-fat milk for** |  |  |  |  | |  |  | |  |  | |
| Whole-fat milk | 0.94 | 0.74,1.18 | 1.03 | 0.81,1.30 | | 1.04 | 0.82,1.31 | | 0.99 | 0.78,1.25 | |
| Buttermilk | 1.04 | 0.92,1.18 | 1.03 | 0.91,1.17 | | 1.03 | 0.90,1.17 | | 1.02 | 0.90,1.16 | |
| Cheese | 1.02 | 0.92,1.14 | 1.02 | 0.92,1.13 | | 1.02 | 0.92,1.14 | | 1.00 | 0.90,1.12 | |
| Butter | 1.00 | 0.90,1.11 | 1.03 | 0.93,1.14 | | 1.04 | 0.93,1.15 | | 1.00 | 0.90,1.11 | |
| **Whole-fat milk for** |  |  |  |  | |  |  | |  |  | |
| Buttermilk | 1.11 | 0.91,1.36 | 1.00 | 0.82,1.23 | | 0.99 | 0.81,1.21 | | 1.03 | 0.84,1.26 | |
| Cheese | 1.09 | 0.91,1.32 | 0.99 | 0.82,1.20 | | 0.99 | 0.81,1.19 | | 1.01 | 0.84,1.23 | |
| Butter | 1.07 | 0.88,1.30 | 1.00 | 0.82,1.23 | | 1.00 | 0.82,1.22 | | 1.01 | 0.83,1.24 | |
| **Buttermilk for** |  |  |  |  | |  |  | |  |  | |
| Cheese | 0.98 | 0.88,1.10 | 0.99 | 0.88,1.10 | | 1.00 | 0.89,1.11 | | 0.99 | 0.88,1.10 | |
| Butter | 0.96 | 0.86,1.08 | 1.00 | 0.89,1.11 | | 1.01 | 0.90,1.13 | | 0.98 | 0.88,1.10 | |
| **Cheese for** |  |  |  |  | |  |  | |  |  | |
| Butter | 0.98 | 0.90,1.06 | 1.01 | 0.93,1.10 | | 1.02 | 0.94,1.10 | | 1.00 | 0.92,1.08 | |

CI: Confidence interval; HR: Hazard ratio. Model 1was adjusted for energy intake and cohort (stratum variable). Model 2 was additionally adjusted for educationa, BMI-adjusted waist circumference, smoking, physical activity and alcohol. Model 3 was additionally adjusted for the Dutch Health Diet index 2015. Model 4 additionally adjusted for baseline hypertension, hypercholesterolemia, diabetes mellitus and myocardial infarction.

**Supplementary table 8. Associations for 1 Serving/Day Substitutions Between Dairy Products and Risk of Total Stroke in the EPIC-NL Cohort Excluding Participant With Hypertension, Hypercholesterolemia, Diabetes Mellitus or Myocardial Infarction at Baseline.**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Substitution** | **Model 1** | | **Model 2** | | **Model 3** | | |
|  | **HR** | **95 % CI** | **HR** | **95 % CI** | | **HR** | **95 % CI** | |
| **Low-fat yoghurt for** |  |  |  |  | |  |  | |
| Whole-fat yoghurt | 2.08 | 0.74,5.86 | 1.70 | 0.61,4.73 | | 1.66 | 0.59,4.61 | |
| Low-fat milk | 1.01 | 0.71,1.45 | 1.05 | 0.74,1.50 | | 1.06 | 0.74,1.50 | |
| Whole-fat milk | 0.93 | 0.60,1.43 | 1.07 | 0.69,1.65 | | 1.08 | 0.70,1.66 | |
| Buttermilk | 0.92 | 0.64,1.32 | 0.95 | 0.67,1.35 | | 0.95 | 0.67,1.35 | |
| Cheese | 0.91 | 0.66,1.26 | 0.95 | 0.70,1.30 | | 0.96 | 0.70,1.31 | |
| Butter | 0.90 | 0.66,1.24 | 0.98 | 0.72,1.33 | | 0.98 | 0.72,1.34 | |
| **Whole-fat yoghurt for** |  |  |  |  | |  |  | |
| Low-fat milk | 0.49 | 0.18,1.30 | 0.62 | 0.23,1.63 | | 0.64 | 0.24,1.69 | |
| Whole-fat milk | 0.45 | 0.16,1.23 | 0.63 | 0.23,1.72 | | 0.65 | 0.24,1.79 | |
| Buttermilk | 0.44 | 0.17,1.18 | 0.56 | 0.21,1.48 | | 0.58 | 0.22,1.53 | |
| Cheese | 0.44 | 0.17,1.15 | 0.56 | 0.22,1.45 | | 0.58 | 0.22,1.50 | |
| Butter | 0.43 | 0.17,1.13 | 0.58 | 0.22,1.49 | | 0.59 | 0.23,1.55 | |
| **Low-fat milk for** |  |  |  |  | |  |  | |
| Whole-fat milk | 0.92 | 0.61,1.38 | 1.02 | 0.67,1.54 | | 1.02 | 0.67,1.54 | |
| Buttermilk | 0.91 | 0.72,1.15 | 0.90 | 0.72,1.14 | | 0.90 | 0.72,1.13 | |
| Cheese | 0.90 | 0.74,1.10 | 0.91 | 0.74,1.10 | | 0.91 | 0.75,1.10 | |
| Butter | 0.89 | 0.74,1.08 | 0.93 | 0.77,1.13 | | 0.93 | 0.77,1.13 | |
| **Whole-fat milk for** |  |  |  |  | |  |  | |
| Buttermilk | 0.99 | 0.70,1.40 | 0.89 | 0.62,1.27 | | 0.88 | 0.62,1.26 | |
| Cheese | 0.98 | 0.71,1.36 | 0.89 | 0.64,1.25 | | 0.89 | 0.64,1.24 | |
| Butter | 0.97 | 0.69,1.37 | 0.92 | 0.64,1.30 | | 0.91 | 0.64,1.30 | |
| **Buttermilk for** |  |  |  |  | |  |  | |
| Cheese | 0.99 | 0.82,1.20 | 1.00 | 0.83,1.21 | | 1.00 | 0.83,1.21 | |
| Butter | 0.98 | 0.81,1.19 | 1.03 | 0.85,1.24 | | 1.03 | 0.85,1.25 | |
| **Cheese for** |  |  |  |  | |  |  | |
| Butter | 0.99 | 0.86,1.13 | 1.03 | 0.90,1.18 | | 1.03 | 0.90,1.18 | |

CI: Confidence interval; HR: Hazard ratio. Model 1was adjusted for energy intake and cohort (stratum variable). Model 2 was additionally adjusted for education, BMI-adjusted waist circumference, smoking, physical activity and alcohol. Model 3 was additionally adjusted for the Dutch Health Diet index 2015.

**Supplementary table 9. Associations for 1 Serving/Day Substitutions Between Dairy Products and Risk of Ischemic Stroke in the EPIC-NL Cohort Excluding Participant With Hypertension, Hypercholesterolemia, Diabetes Mellitus or Myocardial Infarction at Baseline.**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Substitution** | **Model 1** | | **Model 2** | | | | **Model 3** | |
|  | **HR** | **95 % CI** | | **HR** | **95 % CI** | **HR** | | **95 % CI** |
| **Low-fat yoghurt for** |  |  | |  |  |  | |  |
| Whole-fat yoghurt | 2.75 | 0.58,12.98 | | 2.03 | 0.44,9.32 | 2.05 | | 0.44,9.49 |
| Low-fat milk | 0.83 | 0.48,1.44 | | 0.89 | 0.52,1.51 | 0.89 | | 0.52,1.51 |
| Whole-fat milk | 0.88 | 0.45,1.73 | | 1.05 | 0.53,2.05 | 1.04 | | 0.53,2.04 |
| Buttermilk | 0.82 | 0.47,1.42 | | 0.88 | 0.52,1.50 | 0.88 | | 0.51,1.50 |
| Cheese | 0.73 | 0.44,1.19 | | 0.79 | 0.49,1.27 | 0.79 | | 0.49,1.27 |
| Butter | 0.74 | 0.45,1.20 | | 0.83 | 0.52,1.34 | 0.83 | | 0.52,1.34 |
| **Whole-fat yoghurt for** |  |  | |  |  |  | |  |
| Low-fat milk | 0.30 | 0.07,1.29 | | 0.44 | 0.10,1.83 | 0.43 | | 0.10,1.82 |
| Whole-fat milk | 0.32 | 0.07,1.46 | | 0.51 | 0.12,2.30 | 0.51 | | 0.11,2.29 |
| Buttermilk | 0.30 | 0.07,1.27 | | 0.43 | 0.10,1.82 | 0.43 | | 0.10,1.81 |
| Cheese | 0.26 | 0.06,1.09 | | 0.39 | 0.10,1.57 | 0.38 | | 0.09,1.57 |
| Butter | 0.27 | 0.06,1.11 | | 0.41 | 0.10,1.67 | 0.40 | | 0.10,1.67 |
| **Low-fat milk for** |  |  | |  |  |  | |  |
| Whole-fat milk | 1.07 | 0.57,1.98 | | 1.18 | 0.63,2.21 | 1.17 | | 0.63,2.21 |
| Buttermilk | 0.98 | 0.71,1.37 | | 0.99 | 0.71,1.38 | 0.99 | | 0.71,1.38 |
| Cheese | 0.87 | 0.67,1.15 | | 0.89 | 0.68,1.16 | 0.89 | | 0.68,1.16 |
| Butter | 0.89 | 0.68,1.16 | | 0.94 | 0.72,1.23 | 0.94 | | 0.72,1.23 |
| **Whole-fat milk for** |  |  | |  |  |  | |  |
| Buttermilk | 0.30 | 0.07,1.27 | | 0.43 | 0.10,1.82 | 0.43 | | 0.10,1.81 |
| Cheese | 0.82 | 0.50,1.35 | | 0.75 | 0.45,1.26 | 0.75 | | 0.45,1.26 |
| Butter | 0.83 | 0.50,1.41 | | 0.80 | 0.47,1.36 | 0.80 | | 0.47,1.37 |
| **Buttermilk for** |  |  | |  |  |  | |  |
| Cheese | 0.89 | 0.68,1.16 | | 0.89 | 0.69,1.17 | 0.89 | | 0.68,1.17 |
| Butter | 0.90 | 0.69,1.19 | | 0.95 | 0.72,1.25 | 0.95 | | 0.72,1.24 |
| **Cheese for** |  |  | |  |  |  | |  |
| Butter | 1.02 | 0.85,1.21 | | 1.06 | 0.89,1.27 | 1.06 | | 0.88,1.27 |

CI: Confidence interval; HR: Hazard ratio. Model 1was adjusted for energy intake and cohort (stratum variable). Model 2 was additionally adjusted for education, BMI-adjusted waist circumference, smoking, physical activity and alcohol. Model 3 was additionally adjusted for the Dutch Health Diet index 2015.

**Supplementary table 10. Associations for 100 kcal Substitutions Between Dairy Products and Risk of Total Stroke in the EPIC-NL Cohort.**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Substitution** | **Model 1** | | **Model 2** | | **Model 3** | | **Model 4** | |
|  | **HR** | **95 % CI** | **HR** | **95 % CI** | **HR** | **95 % CI** | **HR** | **95 % CI** |
| **Low-fat yoghurt for** |  |  |  |  |  |  |  |  |
| Whole-fat yoghurt | 1.81 | 1.08,3.03 | 1.45 | 0.88,2.40 | 1.37 | 0.83,2.26 | 1.27 | 0.77,2.09 |
| Low-fat milk | 0.87 | 0.72,1.05 | 0.90 | 0.75,1.08 | 0.90 | 0.75,1.08 | 0.90 | 0.75,1.08 |
| Whole-fat milk | 0.83 | 0.68,1.01 | 0.93 | 0.76,1.13 | 0.94 | 0.77,1.14 | 0.91 | 0.75,1.11 |
| Buttermilk | 0.93 | 0.75,1.17 | 0.94 | 0.76,1.17 | 0.93 | 0.75,1.15 | 0.93 | 0.75,1.16 |
| Cheese | 0.92 | 0.77,1.09 | 0.93 | 0.79,1.10 | 0.94 | 0.79,1.11 | 0.92 | 0.78,1.09 |
| Butter | 0.87 | 0.71,1.06 | 0.93 | 0.76,1.14 | 0.95 | 0.78,1.16 | 0.90 | 0.74,1.09 |
| **Whole-fat yoghurt for** |  |  |  |  |  |  |  |  |
| Low-fat milk | 0.48 | 0.29,0.78 | 0.62 | 0.38,1.00 | 0.66 | 0.41,1.07 | 0.71 | 0.44,1.14 |
| Whole-fat milk | 0.46 | 0.28,0.75 | 0.64 | 0.39,1.03 | 0.69 | 0.42,1.12 | 0.72 | 0.44,1.16 |
| Buttermilk | 0.52 | 0.31,0.85 | 0.65 | 0.39,1.06 | 0.68 | 0.41,1.12 | 0.73 | 0.45,1.20 |
| Cheese | 0.51 | 0.31,0.82 | 0.64 | 0.40,1.03 | 0.69 | 0.43,1.10 | 0.72 | 0.45,1.16 |
| Butter | 0.48 | 0.29,0.78 | 0.64 | 0.40,1.04 | 0.69 | 0.43,1.12 | 0.71 | 0.44,1.14 |
| **Low-fat milk for** |  |  |  |  |  |  |  |  |
| Whole-fat milk | 0.95 | 0.79,1.15 | 1.03 | 0.85,1.25 | 1.04 | 0.86,1.26 | 1.01 | 0.83,1.22 |
| Buttermilk | 1.07 | 0.90,1.28 | 1.05 | 0.88,1.24 | 1.03 | 0.87,1.23 | 1.03 | 0.87,1.22 |
| Cheese | 1.05 | 0.93,1.20 | 1.04 | 0.92,1.18 | 1.04 | 0.92,1.18 | 1.02 | 0.90,1.16 |
| Butter | 1.00 | 0.85,1.17 | 1.04 | 0.89,1.22 | 1.05 | 0.90,1.23 | 0.99 | 0.85,1.17 |
| **Whole-fat milk for** |  |  |  |  |  |  |  |  |
| Buttermilk | 1.13 | 0.93,1.37 | 1.01 | 0.83,1.23 | 0.99 | 0.81,1.20 | 1.02 | 0.84,1.24 |
| Cheese | 1.11 | 0.95,1.28 | 1.01 | 0.86,1.17 | 1.00 | 0.86,1.16 | 1.01 | 0.87,1.18 |
| Butter | 1.05 | 0.86,1.28 | 1.01 | 0.82,1.24 | 1.01 | 0.82,1.23 | 0.99 | 0.81,1.21 |
| **Buttermilk for** |  |  |  |  |  |  |  |  |
| Cheese | 0.98 | 0.83,1.17 | 0.99 | 0.84,1.18 | 1.01 | 0.85,1.20 | 0.99 | 0.83,1.17 |
| Butter | 0.93 | 0.76,1.14 | 0.99 | 0.81,1.22 | 1.02 | 0.83,1.25 | 0.96 | 0.79,1.18 |
| **Cheese for** |  |  |  |  |  |  |  |  |
| Butter | 0.95 | 0.81,1.11 | 1.00 | 0.85,1.18 | 1.01 | 0.86,1.18 | 0.97 | 0.83,1.14 |

CI: Confidence interval; HR: Hazard ratio. Model 1 was adjusted for energy intake and cohort (stratum variable). Model 2 was additionally adjusted for education, BMI-adjusted waist circumference, smoking, physical activity and alcohol. Model 3 was additionally adjusted for the Dutch Health Diet index 2015. Model 4 was additionally adjusted for baseline hypertension, Hypercholesterolemia, diabetes mellitus and myocardial infarction.

**Supplementary table 11. Associations for 100 kcal Substitutions Between Dairy Products and Risk of Ischemic Stroke in the EPIC-NL Cohort.**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Substitution** | **Model 1** | | **Model 2** | | **Model 3** | | **Model 4** | |
|  | **HR** | **95 % CI** | **HR** | **95 % CI** | **HR** | **95 % CI** | **HR** | **95 % CI** |
| **Low-fat yoghurt for** |  |  |  |  |  |  |  |  |
| Whole-fat yoghurt | 3.13 | 1.50,6.52 | 2.39 | 1.17,4.89 | 2.26 | 1.11,4.64 | 2.03 | 0.99,4.13 |
| Low-fat milk | 0.85 | 0.66,1.10 | 0.88 | 0.69,1.12 | 0.88 | 0.69,1.13 | 0.89 | 0.69,1.13 |
| Whole-fat milk | 0.76 | 0.59,0.99 | 0.85 | 0.66,1.10 | 0.86 | 0.67,1.11 | 0.83 | 0.64,1.07 |
| Buttermilk | 0.90 | 0.67,1.22 | 0.91 | 0.68,1.22 | 0.91 | 0.68,1.21 | 0.91 | 0.68,1.21 |
| Cheese | 0.91 | 0.72,1.16 | 0.93 | 0.74,1.17 | 0.94 | 0.74,1.18 | 0.91 | 0.72,1.15 |
| Butter | 0.87 | 0.66,1.15 | 0.94 | 0.72,1.24 | 0.96 | 0.73,1.25 | 0.89 | 0.68,1.16 |
| **Whole-fat yoghurt for** |  |  |  |  |  |  |  |  |
| Low-fat milk | 0.27 | 0.14,0.55 | 0.37 | 0.19,0.73 | 0.39 | 0.20,0.78 | 0.44 | 0.22,0.86 |
| Whole-fat milk | 0.24 | 0.12,0.49 | 0.36 | 0.18,0.71 | 0.38 | 0.19,0.76 | 0.41 | 0.21,0.81 |
| Buttermilk | 0.29 | 0.14,0.59 | 0.38 | 0.19,0.77 | 0.40 | 0.20,0.81 | 0.45 | 0.22,0.90 |
| Cheese | 0.29 | 0.15,0.58 | 0.39 | 0.20,0.76 | 0.41 | 0.21,0.81 | 0.45 | 0.23,0.88 |
| Butter | 0.28 | 0.14,0.56 | 0.39 | 0.20,0.79 | 0.42 | 0.21,0.84 | 0.44 | 0.22,0.87 |
| **Low-fat milk for** |  |  |  |  |  |  |  |  |
| Whole-fat milk | 0.89 | 0.70,1.13 | 0.97 | 0.76,1.23 | 0.97 | 0.77,1.24 | 0.93 | 0.73,1.19 |
| Buttermilk | 1.06 | 0.84,1.33 | 1.04 | 0.83,1.30 | 1.02 | 0.82,1.28 | 1.02 | 0.81,1.28 |
| Cheese | 1.07 | 0.90,1.27 | 1.06 | 0.89,1.25 | 1.06 | 0.90,1.25 | 1.03 | 0.87,1.21 |
| Butter | 1.02 | 0.83,1.27 | 1.07 | 0.86,1.33 | 1.08 | 0.87,1.34 | 1.00 | 0.81,1.24 |
| **Whole-fat milk for** |  |  |  |  |  |  |  |  |
| Buttermilk | 1.19 | 0.93,1.53 | 1.07 | 0.84,1.38 | 1.05 | 0.82,1.35 | 1.10 | 0.85,1.41 |
| Cheese | 1.20 | 0.99,1.45 | 1.09 | 0.90,1.33 | 1.09 | 0.90,1.32 | 1.10 | 0.91,1.34 |
| Butter | 1.15 | 0.88,1.49 | 1.11 | 0.85,1.45 | 1.11 | 0.85,1.45 | 1.07 | 0.82,1.39 |
| **Buttermilk for** |  |  |  |  |  |  |  |  |
| Cheese | 1.01 | 0.80,1.27 | 1.02 | 0.81,1.28 | 1.03 | 0.82,1.30 | 1.01 | 0.80,1.26 |
| Butter | 0.97 | 0.74,1.27 | 1.03 | 0.79,1.35 | 1.06 | 0.81,1.38 | 0.98 | 0.75,1.28 |
| **Cheese for** |  |  |  |  |  |  |  |  |
| Butter | 0.96 | 0.77,1.19 | 1.01 | 0.82,1.26 | 1.02 | 0.82,1.27 | 0.97 | 0.78,1.21 |

CI: Confidence interval; HR: Hazard ratio. Model 1 was adjusted for energy intake and cohort (stratum variable). Model 2 was additionally adjusted for education, BMI-adjusted waist circumference, smoking, physical activity and alcohol. Model 3 was additionally adjusted for the Dutch Health Diet index 2015. Model 4 was additionally adjusted for baseline hypertension, Hypercholesterolemia, diabetes mellitus and myocardial infarction.

**Supplementary table 12. Associations for 100 kcal Substitutions Between Dairy Products and Risk of Hemorrhagic Stroke in the EPIC-NL Cohort.**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Substitution** | **Model 1** | | **Model 2** | | **Model 3** | | **Model 4** | |
|  | **HR** | **95 % CI** | **HR** | **95 % CI** | **HR** | **95 % CI** | **HR** | **95 % CI** |
| **Low-fat yoghurt for** |  |  |  |  |  |  |  |  |
| Whole-fat yoghurt | 1.06 | 0.43,2.61 | 0.84 | 0.35,2.03 | 0.78 | 0.32,1.88 | 0.73 | 0.30,1.75 |
| Low-fat milk | 0.84 | 0.59,1.18 | 0.85 | 0.61,1.18 | 0.85 | 0.61,1.19 | 0.85 | 0.61,1.19 |
| Whole-fat milk | 1.03 | 0.69,1.52 | 1.12 | 0.75,1.66 | 1.14 | 0.77,1.69 | 1.10 | 0.74,1.63 |
| Buttermilk | 1.02 | 0.67,1.56 | 1.00 | 0.67,1.52 | 0.99 | 0.66,1.49 | 0.99 | 0.66,1.49 |
| Cheese | 0.89 | 0.65,1.22 | 0.90 | 0.66,1.23 | 0.91 | 0.67,1.23 | 0.89 | 0.66,1.22 |
| Butter | 0.71 | 0.50,1.00 | 0.76 | 0.54,1.08 | 0.77 | 0.55,1.09 | 0.74 | 0.53,1.05 |
| **Whole-fat yoghurt for** |  |  |  |  |  |  |  |  |
| Low-fat milk | 0.79 | 0.34,1.85 | 1.01 | 0.44,2.34 | 1.10 | 0.47,2.53 | 1.16 | 0.51,2.67 |
| Whole-fat milk | 0.97 | 0.40,2.33 | 1.34 | 0.56,3.18 | 1.46 | 0.61,3.48 | 1.51 | 0.64,3.56 |
| Buttermilk | 0.97 | 0.40,2.36 | 1.20 | 0.50,2.89 | 1.28 | 0.53,3.06 | 1.36 | 0.57,3.23 |
| Cheese | 0.84 | 0.36,1.94 | 1.08 | 0.47,2.44 | 1.17 | 0.51,2.65 | 1.22 | 0.54,2.76 |
| Butter | 0.67 | 0.29,1.56 | 0.91 | 0.40,2.10 | 1.00 | 0.43,2.29 | 1.02 | 0.45,2.32 |
| **Low-fat milk for** |  |  |  |  |  |  |  |  |
| Whole-fat milk | 1.23 | 0.82,1.83 | 1.32 | 0.88,1.98 | 1.33 | 0.89,2.00 | 1.30 | 0.86,1.94 |
| Buttermilk | 1.22 | 0.87,1.72 | 1.19 | 0.85,1.66 | 1.16 | 0.83,1.63 | 1.16 | 0.83,1.63 |
| Cheese | 1.06 | 0.84,1.34 | 1.06 | 0.84,1.34 | 1.07 | 0.85,1.34 | 1.05 | 0.83,1.33 |
| Butter | 0.85 | 0.65,1.11 | 0.90 | 0.69,1.18 | 0.91 | 0.69,1.19 | 0.87 | 0.67,1.14 |
| **Whole-fat milk for** |  |  |  |  |  |  |  |  |
| Buttermilk | 1.00 | 0.67,1.49 | 0.90 | 0.60,1.35 | 0.87 | 0.58,1.31 | 0.90 | 0.60,1.35 |
| Cheese | 0.87 | 0.63,1.19 | 0.81 | 0.58,1.11 | 0.80 | 0.58,1.10 | 0.81 | 0.59,1.12 |
| Butter | 0.69 | 0.47,1.01 | 0.68 | 0.46,1.01 | 0.68 | 0.46,1.01 | 0.67 | 0.46,0.99 |
| **Buttermilk for** |  |  |  |  |  |  |  |  |
| Cheese | 0.87 | 0.62,1.21 | 0.90 | 0.65,1.24 | 0.92 | 0.66,1.27 | 0.90 | 0.65,1.25 |
| Butter | 0.69 | 0.48,1.00 | 0.76 | 0.53,1.09 | 0.78 | 0.54,1.12 | 0.75 | 0.52,1.08 |
| **Cheese for** |  |  |  |  |  |  |  |  |
| Butter | 0.80 | 0.61,1.04 | 0.85 | 0.65,1.11 | 0.85 | 0.65,1.11 | 0.83 | 0.64,1.08 |

CI: Confidence interval; HR: Hazard ratio. Model 1 was adjusted for energy intake and cohort (stratum variable). Model 2 was additionally adjusted for education, BMI-adjusted waist circumference, smoking, physical activity and alcohol. Model 3 was additionally adjusted for the Dutch Health Diet index 2015. Model 4 was additionally adjusted for baseline hypertension, Hypercholesterolemia, diabetes mellitus and myocardial infarction.

**Invited**

Prospect: 50313 MORGEN: 50766

**Accepted invitation**

Prospect: 17357 MORGEN: 22654

**Included in the EPIC-NL cohort**

40,011

**Excluded**

Did not permit register linkage: 1.763

Self-reported previous stroke: 453

Poor diet reporters: 352

Missing exposure or covariate information: 557

**Analysed participants**

36,886

**Supplementary figure 1. Participant flowchart**