**Effects of a Six-Day, Whole-Diet Sweet Taste Intervention on Pleasantness, Desire for, and Intakes of Sweet Foods: A Randomised Controlled Trial**

**Supplementary materials**

**Methods:** Intervention instructions for the increased sweet food consumption, decreased sweet food consumption and no diet change (control conditions).







**Table SM1:** Amount served of each of the foods provided in the taste test (taste, texture, weight and energy provided)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Foods1 | Taste | Texture | Weight provided (grams) | Energy provided (kj) | Energy provided (kcal) |
| Apple Juice  | Sweet | Liquid | 12 | 25 | 6 |
| Madeleine Cake  | Sweet | Solid | 4 | 77 | 18 |
| Tinned Peaches  | Sweet  | Soft-solid | 12 | 20 | 5 |
| Low Fat Natural Yoghurt | Non-sweet | Soft-solid | 10 | 33 | 8 |
| Cucumber | Non-sweet | Solid | 10 | 6 | 1.5 |
| Medium Cheddar Cheese  | Non-sweet | Solid | 5 | 87 | 21 |
| Total |  |  | **53** | **248** | **59.5** |

1 All foods were manufactured for *Sainsbury’s Supermarkets Ltd., London, UK,* with the exception of the Madeleine Cakes, which were manufactured by *Bon Maman, Contres, France*.

**Table SM2:** Amount served of each of the foods provided in the buffet meal (taste, weight and energy provided)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Foods1 | Taste | Weight provided (grams) | Energy provided (kJ) | Energy provided (kcal) |
| Bread  | Non-sweet | 250 (6 slices) | 2478 | 592 |
| Butter | Non-sweet | 1 pot2 (150-240g) | 3630 – 7260 | 867 – 1734 |
| Strawberry Jam  | Sweet | 1 pot2 (250-440g) | 2403 – 4806 | 574 – 1148 |
| Honey | Sweet | 1 pot2 (160-330g) | 2377 – 4753 | 568 – 1136 |
| Peanut Butter  | Non-sweet | 1 pot2 (250-440g) | 6014 - 12028 | 1437 - 2874 |
| Madeleine Cake  | Sweet | 100 (4 cakes) | 1916 | 458 |
| Tinned Peaches (Drained)  | Sweet | 240 | 487 | 116 |
| Cucumber | Non-sweet | 120 | 74 | 18 |
| Medium Cheddar Cheese  | Non-sweet | 100 | 1725 | 412 |
| Low Fat Natural Yoghurt  | Non-sweet | 250 | 483 | 115 |
| Apple Juice  | Sweet | 500 | 2500 | 597 |
| Water | Non-sweet | 1000 | 0 | 0 |
| Total |  |  | **24087 - 38510** | **5754 – 9200** |

1 All foods were manufactured for *Sainsbury’s Supermarkets Ltd., London, UK,* with the exception of the Bread, which was manufactured by *KingsMill 50/50, Allied Bakeries, Maidenhead, UK;* the Butter, which was manufactured by *Lurpak spreadable, Arla Foods, Denmark;* the Peanut Butter, which was manufactured by *Whole Earth, Kallo Foods Ltd., Surrey, UK;* and the Madeleine cakes, which were manufactured by *Bon Maman, Contres, France*.

2 Variable amounts provided in standard manufacturer’s jars that ranged from half-full to almost complete

**Table SM3.** Ratings of adherence to the allocated diet (*n* 104)

|  |  |  |  |
| --- | --- | --- | --- |
| Exposure group | Increase sweet food consumption(*n* 40) | Decrease sweet food consumption(*n* 43) | No diet change(*n* 21) |
| Mean | SD | Mean | SD | Mean | SD |
| How well did you adhere to the allocated diet? (0 – 100) | 72 | 18 | 66 | 21 | 91 | 11 |
| How difficult did you find it to adhere to the allocated diet? (0 – 100) | 40 | 28 | 54 | 24 | 20 | 32 |
| How different was your allocated diet to your usual diet? (0 – 100) | 55 | 22 | 48 | 22 | 9 | 16 |

**Table SM4.** Outcome measures for all taste ratings on day 0 and day 7 by intervention group (*n* 104)

|  |  |  |  |
| --- | --- | --- | --- |
| Exposure group  | Increased sweet food consumption(*n* 40) | Decreased sweet food consumption(*n* 43) | No diet change(*n* 21) |
| Mean | SD | Mean | SD | Mean | SD |
| Ratings for sweet foods (100 mm VAS) |
| Pleasantness (0 – 100)  |  |  |  |  |  |  |
| Day 0 | 71 | 16 | 68 | 17 | 71 | 15 |
| Day 7  | 66 | 16 | 63 | 20 | 68 | 18 |
| ∆ Day 0 – Day 7 | -5 | 16 | -5 | 15 | -3 | 13 |
| Desire to eat (0 – 100) |  |  |  |  |  |  |
| Day 0  | 65 | 18 | 59 | 23 | 62 | 18 |
| Day 7  | 63 | 16 | 56 | 23 | 58 | 24 |
| ∆ Day 0 – Day 7 | -2 | 19 | -3 | 20 | -5 | 13 |
| Sweet taste intensity (0 – 100) |  |  |  |  |  |  |
| Day 0  | 76 | 11 | 74 | 14 | 75 | 11 |
| Day 7 | 71 | 15 | 77 | 15 | 73 | 12 |
| ∆ Day 0 – Day 7 | -5 | 15 | 3 | 15 | -1 | 12 |
| Ratings for non-sweet foods (100 mm VAS) |
| Pleasantness (0 – 100) |  |  |  |  |  |  |
| Day 0  | 57 | 19 | 57 | 16 | 56 | 13 |
| Day 7 | 49 | 17 | 55 | 17 | 54 | 17 |
| ∆ Day 0 – Day 7 | -8 | 18 | -1 | 19 | -2 | 12 |
| Desire to eat (0 – 100) |  |  |  |  |  |  |
| Day 0  | 53 | 22 | 54 | 18 | 45 | 15 |
| Day 7 | 45 | 17 | 50 | 17 | 47 | 17 |
| ∆ Day 0 – Day 7 | -7 | 20 | -4 | 18 | 2 | 14 |
| Sweet taste intensity (0 – 100) |  |  |  |  |  |  |
| Day 0  | 26 | 17 | 25 | 17 | 21 | 12 |
| Day 7  | 29 | 18 | 34 | 20 | 24 | 16 |
| ∆ Day 0 – Day 7 | 4 | 18 | 9 | 18 | 2 | 11 |

**Table SM5.** Outcome measures for all sweet food and beverage intake outcomes on day 0 and day 7 (*n* 104)

|  |  |  |  |
| --- | --- | --- | --- |
| Exposure group  | Increased sweet food consumption(*n* 40) | Decreased sweet food consumption(*n* 43) | No diet change(*n* 21) |
| Mean | SD | Mean | SD | Mean | SD |
| Intake at breakfast |  |  |  |  |  |  |
| Percent food and beverage weight consumed from sweet foods and beverages (%) |
| Day 0 | 30.7 | 19.8 | 29.6 | 19.6 | 32.0 | 21.5 |
| Day 7 | 36.0 | 21.9 | 24.5 | 18.3 | 27.2 | 20.0 |
| ∆ Day 0 – Day 7 | 5.3 | 22.7 | -5.1 | 20.4 | -4.8 | 27.2 |
| Percent food weight consumed from sweet foods (%) |
| Day 0 | 34.7 | 22.9 | 31.0 | 27.2 | 35.2 | 26.8 |
| Day 7 | 36.1 | 26.0 | 30.8 | 25.8 | 32.6 | 29.9 |
| ∆ Day 0 – Day 7 | 1.4 | 25.0 | -0.2 | 23.8 | -2.6 | 21.7 |
| Percent food and beverage energy consumed from sweet foods and beverages (%en) |
| Day 0 | 37.1 | 24.5 | 38.9 | 27.1 | 36.2 | 20.8 |
| Day 7 | 38.5 | 24.5 | 35.0 | 27.1 | 37.6 | 28.0 |
| ∆ Day 0 – Day 7 | 1.4 | 25.0 | -3.9 | 27.3 | 1.4 | 23.2 |
| Percent food energy consumed from sweet foods (%en) |
| Day 0 | 32.2 | 25.1 | 27.4 | 25.4 | 29.6 | 22.5 |
| Day 7 | 28.4 | 19.0 | 24.6 | 23.1 | 27.4 | 27.3 |
| ∆ Day 0 – Day 7 | -3.7 | 25.2 | -2.8 | 24.2 | -2.3 | 22.1 |
| Sugars consumed (g) |  |  |  |  |  |  |
| Day 0  | 29.6 | 18.2 | 25.4 | 15.9 | 22.3 | 15.1 |
| Day 7 | 31.4 | 20.4 | 28.1 | 22.4 | 21.4 | 22.2 |
| ∆ Day 0 – Day 7 | 1.8 | 14.5 | 2.7 | 18.6 | -0.8 | 23.8 |
| Sugars consumed from foods only(g) |  |  |  |  |  |  |
| Day 0  | 20.4 | 13.0 | 16.1 | 13.7 | 14.4 | 9.5 |
| Day 7 | 20.3 | 13.2 | 17.7 | 13.7 | 13.2 | 20.2 |
| ∆ Day 0 – Day 7 | -0.1 | 7.9 | 1.6 | 13.1 | -1.2 | 17.6 |
| Percentage energy consumed from sugars (%en) |
| Day 0 | 19.5 | 11.2 | 24.2 | 19.9 | 21.9 | 9.4 |
| Day 7  | 21.2 | 13.2 | 20.4 | 15.4 | 23.1 | 14.5 |
| ∆ Day 0 – Day 7 | 1.7 | 10.0 | -3.8 | 17.8 | 1.2 | 11.9 |
| Percentage energy consumed from sugars from foods only (%en) |
| Day 0 | 14.0 | 6.9 | 14.3 | 15.3 | 16.2 | 8.3 |
| Day 7  | 13.1 | 7.7 | 12.0 | 8.0 | 14.5 | 13.5 |
| ∆ Day 0 – Day 7 | -0.9 | 6.5 | -2.3 | 13.2 | -1.7 | 11.5 |

**Table SM6.** Results of the regression analyses on pleasantness, desire to eat and sweet taste intensity ratings (*n* 104)

|  |  |  |  |
| --- | --- | --- | --- |
| Outcome | Pleasantness | Desire to Eat |  Sweet taste intensity |
| Regression equation | R2= .44, F(11, 103)= 21.62, p< .01 | R2= .40, F(11, 103)= 15.16, p< .01 | R2= .75, F(11, 103)= 64.83, p< .01 |
|  | Co-efficient | p | Co-efficient  | p | Co-efficient | p |
| Group (decrease / no diet change / increase) | -1.525 | .25 | -1.089 | .46 | -2.565 | .04 |
| Adherence (0 – 100) | .116 | .06 | .151 | .02 | .013 | .84 |
| Difficulty (0 – 100) | -.025 | .54 | -.046 | .43 | .019 | .65 |
| Difference from usual diet (0 – 100) | -.006 | .89 | .034 | .57 | -.017 | .73 |
| Foods – sweet / non-sweet | -5.189 | .03 | -5.463 | .03 | -14.520 | <.01 |
| Variable, day 0  | .572 | <.01 | .562 | <.01 | .581 | <.01 |
| Gender (male / female) | -.756 | .76 | .354 | .90 | -4.170 | .10 |
| Age (years) | -.198 | .31 | -.165 | .41 | -.045 | .79 |
| Location (Bristol / Bournemouth) | 5.186 | .06 | .838 | .76 | 4.101 | .09 |
| Hunger, day 7 (0 - 100) | -.004 | .94 | .019 | .78 | -.073 | .14 |
| Thirst, day 7 (0 – 100) | .040 | .43 | .070 | .24 | -.002 | .96 |

**Results:** Repeated Analyses to investigate the effects of the intervention in the absence of the control group (increase vs decrease sweet food consumption)

***Pleasantness and desire to eat***

*Pleasantness*

Sweet foods were rated as more pleasant than non-sweet foods (*F*(1, 81) = 34.84, *p* < .001, np2 = .30; *Mdiff* = 13 mm, *SE* = 2). Pleasantness ratings for all foods also decreased from day 0 to day 7 (*F*(1, 81) = 12.91, *p* < .001, np2 = .14, *Mdiff* = 5 mm, *SE* = 1). No statistically significant dietary exposure group x time interactions (largest *F(2, 81)* = 2.02, *p* = .16, np2 = .02), or group x time x food type interactions (F(2, 101) = 2.36, p = .13, np2 = .03) were found.

*Desire to eat*

Desire to eat for sweet foods was higher than for non-sweet foods (*F*(1, 81) = 16.25, *p* < .001, np2 = .17; *Mdiff* = 10 mm, *SE* = 2), and desire to eat all foods decreased from day 0 to day 7 (*F*(1, 81) = 7.01, *p* = .01, np2 = .08, *Mdiff* = 4 mm, *SE* = 2). There were no statistically significant dietary exposure group x time interactions (largest *F*(2, 81)= 0.15, *p* = .70, np2 < .01) or group x time x food type interactions (*F*(2, 81)= 0.79, *p* = .38, np2 = .01).

***Sweet Food Intakes***

No statistically significant effects of time were observed either in foods only or in foods and beverages (largest *F* (1, 81) = 1.87, *p* = .18, np2 = .02). The significant dietary exposure x time interaction in % food and beverage weight consumed from sweet foods and beverages was found (*F* (1, 81) = 4.85, *p* = .03, np2 = .06), but no effects were found in % weight consumed from sweet foods only (*F* (1, 81) = .09, *p* = .76, np2 < .01). No other statistically significant dietary exposure x time interactions were observed either in foods only or in foods and beverages (largest *F* (1, 81) = 2.93, *p* = .09, np2 = .04).

***Sweet Taste Intensity***

Sweet foods were rated as sweeter than non-sweet foods (*F*(1, 81) = 677.74, *p* < .001, np2 = .89; *Mdiff* = 46 mm, *SE* = 2), and there was a significant food type x time interaction (*F*(1, 81) = 8.22, *p* = .01, np2 = .09), where non-sweet foods were rated as sweeter on day 7 compared to day 0 (*t*(82) = 3.26, p < .01), but there was no change in sweet taste intensity for the sweet foods (*t*(82) = 0.55, p = .58). A significant dietary exposure group x time interaction was also found (*F*(1, 81) = 7.00, *p* = .01, np2 = .08). Participants in the decrease sweet food consumption group reported all foods as more sweet on day 7 compared to day 0 (t(42) = 3.36, p < .01, *Mdiff* = 6 mm, *SE* = 2), but no changes were found in the increase sweet food consumption group (largest t(39) = .38, p = .70, *Mdiff* = 1 mm, *SE* = 2). Sweet taste intensity also increased for all foods over time (*F*(1, 81) = 4.44, *p* = .04, np2 = .05; *Mdiff* = 3 mm, *SE* = 2),

***Appetite***

Hunger, fullness and thirst ratings did not change over time (largest *F*(1, 81) = 2.26, *p* = .14, np2 = .03), and no statistically significant dietary exposure group x time interactions were detected for any of these measures (largest *F*(2, 81) = 2.36, *p* = .13, np2 = .03).

**Table SM7.** Results of the regression analyses on all sweet food intake outcomes (*n* 104)

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Outcome | %weight sweet foods and beverages | %weight sweet foods | % energy sweet foods and beverages | % energy sweet foods | Sugars from foods and beverages | Sugars from foods only | % energy from sugars (foods and beverages) | % energy from sugars (foods only) |
| Regression equation | R2= .28,Adj R2 = .20 F(10, 103)= 3.65, p< .01 | R2= .41,Adj R2 = .35, F(10, 103)= 6.50, p< .01 | R2= .33,Adj R2 = .26 F(10, 103)= 4.54, p< .01 | R2= .33,Adj R2 = .26, F(10, 103)= 4.56, p< .01 | R2= .37,Adj R2 = .31 F(10, 103)= 5.53, p< .01 | R2= .41,Adj R2= .34, F(10, 103)= 6.37, p< .01 | R2= .34,Adj R2 = .27 F(10, 103)= 4.73, p< .01 | R2= .35,Adj R2 = .29, F(10, 103)= 5.15, p< .01 |
|  | Co-efficient | p | Co-efficient | p | Co-efficient | p | Co-efficient | p | Co-efficient | p | Co-efficient | p | Co-efficient | p | Co-efficient | p |
| Group (decrease / no diet change / increase | 4.292 | .06 | .492 | .85 | 1.063 | .70 | -.045 | .99 | -1.348 | .55 | -1.070 | .48 | .576 | .71 | -.292 | .76 |
| Adherence (0 – 100) | .014 | .91 | .194 | .16 | .172 | .24 | .155 | .22 | .025 | .83 | .040 | .61 | .093 | .24 | .080 | .11 |
| Difficulty (0 – 100) | -.029 | .70 | -.009 | .92 | .002 | .99 | -.011 | .90 | -.100 | .18 | -.060 | .24 | -.062 | .23 | -.055 | .09 |
| Difference from usual diet (0 – 100) | .157 | .08 | .144 | .16 | .177 | .10 | .119 | .20 | .139 | .11 | .054 | .36 | .093 | .12 | .037 | .31 |
| Variable, day 0  | .313 | <.01 | .544 | <.01 | .460 | <.01 | .357 | <.01 | .698 | <.01 | .674 | <.01 | .519 | <.01 | .311 | <.01 |
| Gender (male / female) | 7.084 | .10 | -7.865 | .12 | 2.764 | .60 | -3.452 | .45 | 3.936 | .35 | -2.164 | .45 | 1.876 | .52 | -3.951 | .04 |
| Age (years) | -.552 | .10 | -.684 | .09 | -1.015 | .02 | -.957 | .01 | -.172 | .59 | -.085 | .70 | -.125 | .59 | -.112 | .44 |
| Location (Bristol / Bournemouth) | -4.104 | .41 | 1.713 | .77 | 3.466 | .57 | 1.175 | .82 | -3.163 | .54 | -2.905 | .40 | -1.664 | .62 | -2.975 | .16 |
| Hunger, day 7 (0 - 100) | -.024 | .81 | -.092 | .41 | -.098 | .42 | -.116 | .26 | -.080 | .40 | -.032 | .62 | .028 | .67 | .022 | .59 |
| Thirst, day 7 (0 – 100) | -.007 | .93 | -.092 | .37 | -.045 | .67 | -.095 | .30 | .003 | .98 | -.050 | .40 | -.036 | .53 | -.080 | .04 |