

Supplementary

Table S1. Carry-over experiment for aspartame and its degradation products.

| | APM | Phe | DKP | Asp-Phe |
|----------------------|--------|------|------|---------|
| Mean sample low (L) | 226.6 | 1.9 | 0.0 | 24.8 |
| Mean sample high (H) | 1882.0 | 1.7 | 60.3 | 136.7 |
| Mean L-L | 226.8 | 1.9 | 0.0 | 24.7 |
| Mean L-H | 226.0 | 1.8 | 0.0 | 24.7 |
| 3*SD L-L | 23.80 | 0.63 | 0.00 | 1.21 |
| Difference L-L - L-H | 0.75 | 0.08 | 0.00 | 0.05 |
| Carry over | No | * | No | No |

Concentrations in $\mu\text{mol/L}$. APM; Aspartame, Phe; phenylalanine, DKP; diketopiperazine, Asp-Phe; aspartylphenylalanine The mean and standard deviation of sample low after sample low (L-L: L2, L5, L6 en L7) and sample low after sample high (L-H: L3, L4, L8, L9 en L10) were calculated. Carry-over was considered present when mean L-H – mean L-L $< 3^* \text{SD}$ of L-L. * Carry-over of Phe could not be calculated from these samples, as mean sample high was similar to mean sample low.

| | | | | | | | | |
|------------------------------|-------------------------|-------------------------------|------|------|------|-----|------|-----------|
| Group C | C | Sprite (low in sugar) | ES | 351 | 0.01 | 22 | 28 | 401 |
| | | Sprite Lemon Lime & Cactus | NL | 676 | 2 | 15 | 33 | 726 |
| | | Sprite Lemon Lime & Cranberry | NL | 716 | 2 | 19 | 34 | 770 |
| | | Sprite No Sugar | BE | 786 | 0 | 21 | 37 | 843 |
| | | Sprite No Sugar | DK | 773 | 0 | 27 | 43 | 842 |
| | | | | | | | | 716 (183) |
| | A | Coca Cola | TR | 0 | 0 | 0 | 0 | 0 |
| | | Coca Cola | FI | 0 | 0 | 0 | 0 | 0 |
| | | | | | | | | 0 (0) |
| | B | Coca Cola Light | BE | 792 | 0 | 20 | 47 | 858 |
| | | Coca Cola Light | NL | 740 | 2 | 14 | 50 | 805 |
| | | Coca Cola Light | SE | 726 | 0 | 19 | 54 | 799 |
| | | Coca Cola Light | DE | 235 | 3 | 20 | 90 | 348 |
| | | Coca Cola Light Exotic Mango | SE | 630 | 2 | 39 | 81 | 750 |
| | | Coca Cola Light Exotic Mango | DE | 506 | 7 | 45 | 129 | 687 |
| | | Coca Cola Light Exotic Mango | NL | 502 | 6 | 28 | 136 | 672 |
| | | Coca Cola Light Ginger Lime | NL | 630 | 4 | 21 | 115 | 770 |
| | | Coca Cola Light Ginger Lime | DE | 267 | 3 | 22 | 76 | 368 |
| | | | | | | | | |
| | C | Coca Cola Zero Sugar | BE | 1255 | 0.04 | 40 | 63 | 1359 |
| Coca Cola Zero Sugar | | FR | 1275 | 0 | 28 | 47 | 1350 | |
| Coca Cola Zero Sugar | | DK | 1180 | 0.7 | 30 | 104 | 1314 | |
| Coca Cola Zero Sugar | | GB | 1085 | 4 | 71 | 140 | 1300 | |
| Coca Cola Zero Sugar | | FI | 1018 | 4 | 63 | 102 | 1186 | |
| Coca Cola Zero Sugar | | NL | 1074 | 2 | 23 | 59 | 1157 | |
| Coca Cola Zero Sugar | | ES | 389 | 0 | 10 | 22 | 422 | |
| Coca Cola Zero Sugar | | DE | 151 | 12 | 47 | 100 | 310 | |
| Coca Cola Zero Sugar | | TR | 0 | 0 | 0 | 0 | 0 | |
| Coca Cola Zero Sugar Lemon | | BE | 739 | 0.2 | 29 | 53 | 821 | |
| Coca-Cola Zero Sugar Cherry | | NL | 730 | 0.9 | 7 | 27 | 766 | |
| Coca-Cola Zero Sugar Lemon | | NL | 786 | 0.8 | 8 | 28 | 823 | |
| Coca-Cola Zero Sugar Vanilla | | NL | 770 | 1 | 10 | 32 | 813 | |
| | | | | | | | | 894 (439) |
| D | | Pepsi Max Cherry No Sugar | FI | 1310 | 26 | 184 | 331 | 1850 |
| | Pepsi Max Lime No Sugar | FI | 1480 | 15 | 145 | 228 | 1867 | |
| | Pepsi Max No Sugar | GB | 1640 | 7 | 111 | 198 | 1955 | |
| | Pepsi Max No Sugar | SE | 1410 | 21 | 156 | 318 | 1905 | |
| | Pepsi Max No Sugar | FI | 1530 | 9 | 114 | 203 | 1856 | |

| | | | | | | | 1887 (44) | |
|--|-------------------------------------|----------------------------|------|-----|-----|-----|------------|-----|
| E | Pepsi Max Zero Caffeine Zero Sugar | BE | 1500 | 13 | 112 | 222 | 1847 | |
| | Pepsi Max Zero Sugar | DE | 1790 | 3 | 64 | 156 | 2013 | |
| | Pepsi Max Zero Sugar | BE | 1670 | 4 | 64 | 159 | 1897 | |
| | Pepsi Max Zero Sugar | NL | 1635 | 7 | 86 | 164 | 1892 | |
| | Pepsi Max Zero Sugar Cherry | BE | 1270 | 30 | 166 | 319 | 1784 | |
| | Pepsi Max Zero Sugar Cherry Flavour | NL | 1760 | 6 | 65 | 161 | 1991 | |
| | Pepsi Max Zero Sugar Ginger Flavour | NL | 1580 | 12 | 107 | 221 | 1920 | |
| | Pepsi Max Zero Sugar Lemon | BE | 1260 | 2 | 46 | 80 | 1388 | |
| | Pepsi Max Zero Sugar Lemon Flavour | NL | 1180 | 7 | 68 | 114 | 1369 | |
| | | | | | | | 1789 (243) | |
| | A | Aquarius Zero Sugar Orange | ES | 130 | 0 | 4 | 15 | 148 |
| | | Bullit Sugar Free | NL | 557 | 2 | 29 | 30 | 618 |
| Bullit Sugar Free Citrus Splash | | NL | 385 | 5 | 45 | 52 | 486 | |
| Bullit Sugarfree Full Berry | | NL | 363 | 6 | 48 | 52 | 470 | |
| Diet Pepsi | | GB | 999 | 3 | 68 | 96 | 1166 | |
| Dr Pepper | | GB | 356 | 0 | 18 | 47 | 420 | |
| Dr Pepper | | FI | 0 | 0 | 0 | 0 | 0 | |
| Freeway Cola Zero | | FI | 280 | 5 | 40 | 93 | 418 | |
| Freeway Cola Zero Sugar | | NL | 405 | 1 | 2 | 26 | 434 | |
| Golden Power Energy Drink met Taurine Zero | | NL | 504 | 2 | 26 | 34 | 565 | |
| Hero Cassis Zero | | NL | 247 | 3 | 1 | 16 | 267 | |
| Highway Cassis | | NL | 451 | 4 | 20 | 39 | 514 | |
| Highway Cola | | NL | 101 | 2 | 0.2 | 33 | 136 | |
| Highway Cola Light | | NL | 596 | 14 | 74 | 141 | 825 | |
| Highway Lemon Lime | | NL | 116 | 0.9 | 5 | 16 | 137 | |
| Highway Orange | | NL | 226 | 2 | 16 | 26 | 271 | |
| Irn-Bru | | GB | 412 | 0 | 24 | 45 | 481 | |
| Jaffa Ananas Sokeriton | | FI | 1085 | 10 | 109 | 128 | 1332 | |
| Jaffa Appelsiini | | FI | 0 | 1 | 0 | 0 | 1 | |
| Jaffa Appelsiini | | FI | 0 | 1 | 0 | 0 | 1 | |
| Jaffa Appelsiini Sokeriton | | FI | 1340 | 4 | 49 | 61 | 1455 | |
| Jaffa Lime-Verigreippi Sokeriton | | FI | 302 | 2 | 18 | 27 | 349 | |
| Jaffa Vesimeloni-Vadelma Sokeriton | | FI | 725 | 0 | 23 | 37 | 784 | |

| | | | | | | |
|--|----|------|-----|-----|-----|-----------|
| Jumbo Cola Coconut Flavour 0% Sugar | NL | 667 | 4 | 34 | 57 | 762 |
| Jumbo Cola Light | NL | 405 | 24 | 94 | 146 | 667 |
| Jumbo Cola Zero Sugar | NL | 119 | 2 | 31 | 51 | 1269 |
| Jumbo Cola Zero Sugar Cherry Taste | NL | 456 | 6 | 32 | 77 | 570 |
| K Menu Cola Light | FI | 1525 | 12 | 123 | 272 | 1931 |
| Look Cola Zero | FR | 1630 | 3 | 60 | 119 | 1813 |
| Lucozade Energy | GB | 286 | 0 | 12 | 24 | 322 |
| Mountain Dew | FI | 0 | 0 | 0 | 0 | 0 |
| Nestea No Sugar Lemon | ES | 173 | 0 | 6 | 15 | 194 |
| Pepsi | FI | 0 | 0 | 0 | 0 | 0 |
| Red Bull Sugarfree | NL | 552 | 3 | 40 | 46 | 641 |
| Red Bull Sugarfree | ES | 549 | 1 | 48 | 36 | 634 |
| Red Bull Zero Callories | NL | 451 | 2 | 21 | 29 | 503 |
| Redbull Zero Sugar | SE | 423 | 0.1 | 32 | 42 | 497 |
| Ribena Light Blackcurrant | GB | 734 | 0.5 | 38 | 55 | 827 |
| River Cola Zero | NL | 1020 | 5 | 49 | 113 | 1187 |
| Royal Club Tonic with a Hint of Grapefruit | NL | 103 | 1 | 1 | 14 | 119 |
| | | | | | | 580 (484) |

APM; aspartame, Phe; phenylalanine, DKP; diketopiperazine, Asp-phe; aspartylphenylalanine, NL; Netherlands, BE; Belgium, FI; Finland, FR; France, TR; Turkey, DE; Germany, GB; England, ES; Spain, DK; Denmark, SE; Sweden.

