Optimizing school food supply: integrating environmental, health, economic, and cultural dimensions of diet sustainability with linear programming

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**Supplementary Table S1.** Nutrient constraints applied during all linear optimization procedures. Values apply to a one-day supply of a standard pupil. Values were standardised for age and sex of the pupils visiting the schools included in this study.

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| --- | --- | --- |
|  | Lower limit | Upper limit |
| Energy (kcal)1 | 604 | 604 |
| Carbohydrates (E%)2 | 45 | 60 |
| Fat (E%)2 | 22 | 40 |
| Protein (E%)2 | 10 | 20 |
| Fiber (E%)3 | 2 | — |
| Saturated fatty acids (E%)2 | — | 10 |
| Mono unsaturated fatty acids (E%)2 | 10 | 20 |
| Poly unsaturated fatty acids (E%)2 | 5 | 10 |
| Vitamin A (µg)3 | 168 | — |
| Vitamin D (µg)3 | 3 | 30 |
| Vitamin E (mg)3 | 2.2 | 90 |
| Thiamine (mg)3 | 0.3 | — |
| Riboflavin (mg)3 | 0.4 | — |
| Vitamin C (mg)3 | 15.3 | 300 |
| Niacin (mg)3 | 4.2 | 270 |
| Vitamin B6 (mg)3 | 0.4 | 7.5 |
| Vitamin B12 (µg)3 | 0.5 | — |
| Folate (µg)3 | 57.6 | 300 |
| Phosphor (mg)3 | 190.8 | 900 |
| Iodine (µg)3 | 41.4 | 180 |
| Iron (mg)3 | 3.3 | 7.5 |
| Calcium (mg)3 | 246 | 750 |
| Potassium (mg)3 | 810 | — |
| Magnesium (mg)3 | 76.5 | — |
| Salt (g)4 | — | 3.6 |
| Selenium (µg)3 | 11.7 | 90 |
| Zink (mg) 3 | 2.7 | 7.5 |
| Omega-3 fatty acids (E%)3 | 3.3 | — |

1 Lower and upper limits based on 30% of daily estimated energy requirement (EER), averaged values over 10 grades (preparatory class to ninth grade) and both sexes.

2 Lower and upper limits based on 30% of daily recommended intake ranges, averaged values over 10 grades (preparatory class to ninth grade) and both sexes.

3 Lower limit based on 30% of daily recommended intakes (RIs) and potential upper limit based on 30% of daily estimated Upper intake levels (ULs), averaged values over 10 grades (preparatory class to ninth grade) and both sexes.

4 Upper limit based on 30% of daily recommended intake (RIs).

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