

**Table 14-3. Concentration (mg/kg) of food additives by food category for youth (15-19 year olds).**

For undetected samples, the detection limit or the determination limit was applied in estimation.

|   |                               |
|---|-------------------------------|
|   | : Detection limit is used.    |
| * | : Quantitation limit is used. |

| Compound                            | Group A/B * | 15-19 year olds             |             |                                 |                             |                                     |                                    |                                       | Maximum intake |
|-------------------------------------|-------------|-----------------------------|-------------|---------------------------------|-----------------------------|-------------------------------------|------------------------------------|---------------------------------------|----------------|
|                                     |             | I. Seasonings and beverages | II. Cereals | III. Potatoes, legumes and nuts | IV. Fish/shellfish and meat | V. Fats/oils and milk/milk products | VI. Sugar and confections/savories | VII. Fruits, vegetables, and seaweeds |                |
| <b>Food Intake (g)</b>              |             | 186.84                      | 293.71      | 126.83                          | 256.59                      | 186.95                              | 43.36                              | 359.08                                |                |
| Aspartame                           | A           | 1.93068                     | 0.29371     | 0.12683                         | 0.25659                     | 0.18695                             | 0.708213333                        | 0.35908                               | 3.86           |
| Xylitol                             | B           | 1.8684                      | 2.9371      | 1.2683                          | 2.5659                      | 1.8695                              | 6.9376                             | 3.5908                                | 21             |
| Glycyrrhizine                       | B           | 0.317628                    | 0.0146855   | * 0.063415                      | * 0.128295                  | 0.0093475                           | 0.0372896                          | * 0.17954                             | 0.75           |
| Sodium saccharin                    | A           | 0.018684                    | 0.058742    | 0.025366                        | 0.2                         | 0.03739                             | 0.008672                           | 0.071816                              | 0.421          |
| D-Sorbitol                          | B           | 57.9204                     | 93.9872     | 43.1222                         | 254.0241                    | 3.739                               | 186.0144                           | 186.7216                              | 826            |
| D-Mannitol                          | B           | 24.2892                     | 1013.2995   | 105.2689                        | 12.8295                     | 1.8695                              | 3.9024                             | 150.8136                              | 1312           |
| Amaranth                            | A           | 0.00037368                  | 0.0005874   | 0.00025366                      | 0.00051318                  | 0.0003739                           | 0.00008672                         | 0.00071816                            | 0.00291        |
| Erythrosine                         | A           | 0.00037368                  | 0.0005874   | 0.00025366                      | 0.00128295                  | 0.0003739                           | 0.00008672                         | 0.00071816                            | 0.00368        |
| Allura red AC                       | A           | 0.00037368                  | 0.0005874   | 0.00025366                      | 0.00051318                  | 0.0003739                           | 0.00008672                         | 0.00071816                            | 0.00291        |
| New coccine                         | A           | 0.00037368                  | 0.0005874   | 0.00025366                      | 0.00076977                  | 0.0003739                           | 0.00008672                         | 0.00502712                            | 0.00747        |
| Phloxine                            | A           | 0.00037368                  | 0.0005874   | 0.00025366                      | 0.00051318                  | 0.0003739                           | 0.00008672                         | 0.00071816                            | 0.00291        |
| Rose bengale                        | A           | 0.00037368                  | 0.0005874   | 0.00025366                      | 0.00051318                  | 0.0003739                           | 0.00008672                         | 0.00071816                            | 0.00291        |
| Acid red                            | A           | 0.00037368                  | 0.0005874   | 0.00025366                      | 0.00051318                  | 0.0003739                           | 0.00008672                         | 0.00071816                            | 0.00291        |
| Tartrazine                          | A           | 0.00037368                  | 0.0005874   | 0.00025366                      | 0.00051318                  | 0.0003739                           | 0.00052032                         | 0.00071816                            | 0.00334        |
| Sunset yellow FCF                   | A           | 0.00037368                  | 0.0005874   | 0.00025366                      | 0.00051318                  | 0.0003739                           | 0.00008672                         | 0.00071816                            | 0.00291        |
| Fast green FCF                      | A           | 0.00037368                  | 0.0005874   | 0.00025366                      | 0.00051318                  | 0.0003739                           | 0.00008672                         | 0.00071816                            | 0.00291        |
| Brilliant blue FCF                  | A           | 0.00037368                  | 0.0005874   | 0.00025366                      | 0.00051318                  | 0.0003739                           | 0.00008672                         | 0.00071816                            | 0.00291        |
| Indigo carmine                      | A           | 0.00037368                  | 0.0005874   | 0.00025366                      | 0.00051318                  | 0.0003739                           | 0.00008672                         | 0.00071816                            | 0.00291        |
| Titanium dioxide                    | B           | 0.00037368                  | 0.0005874   | 0.00025366                      | 0.00051318                  | 0.0003739                           | 0.00008672                         | 0.00071816                            | 0.00291        |
| $\beta$ -Carotene                   | B           | 0.137016                    | 0.0205597   | 0.003382133                     | 0.0136848                   | 0.017448667                         | 0.0125744                          | 1.7164024                             | 1.92           |
| Norbixine                           | A           | 0.09342                     | 0.146855    | 0.063415                        | 0.128295                    | 0.093475                            | 0.02168                            | 0.17954                               | 0.727          |
| Sulfurous acid                      | B           | 0.009342                    | 0.29371     | 0.12683                         | 0.25659                     | 0.093475                            | 0.04336                            | 0.35908                               | 1.18           |
| Benzoic acid                        | A           | 0.74225304                  | 0.0578609   | 0.05301494                      | 0.06055524                  | 0.35427025                          | 0.020451467                        | 0.041892667                           | 1.33           |
| Sorbic acid                         | A           | 0.009342                    | 2.73        | 0.86                            | 17.31                       | 0.0093475                           | 0.57                               | 0.64                                  | 22.1           |
| Dehydroacetic acid                  | A           | 0.028026                    | 0.0440565   | 0.0190245                       | 0.0384885                   | 0.0280425                           | 0.006504                           | 0.053862                              | 0.218          |
| Isobutyl <i>p</i> -hydroxybenzoate  | A           | 0.009342                    | 0.029371    | 0.012683                        | 0.025659                    | 0.0093475                           | 0.004336                           | 0.035908                              | 0.127          |
| Isopropyl <i>p</i> -hydroxybenzoate | A           | 0.009342                    | 0.029371    | 0.012683                        | 0.025659                    | 0.0093475                           | 0.004336                           | 0.035908                              | 0.127          |
| Ethyl <i>p</i> -hydroxybenzoate     | A           | 0.112104                    | 0.029371    | 0.012683                        | 0.025659                    | 0.0093475                           | 0.004336                           | 0.035908                              | 0.229          |
| Butyl <i>p</i> -hydroxybenzoate     | A           | 0.448416                    | 0.029371    | 0.012683                        | 0.025659                    | 0.0093475                           | 0.004336                           | 0.035908                              | 0.566          |
| Propyl <i>p</i> -hydroxybenzoate    | A           | 0.009342                    | 0.029371    | 0.012683                        | 0.025659                    | 0.0093475                           | 0.004336                           | 0.035908                              | 0.127          |
| Propionic acid                      | B           | 0.52938                     | * 0.58742   | 0.321302667                     | 0.795429                    | * 0.18695                           | * 0.08672                          | * 0.71816                             | 3.23           |
| EDTA                                | A           | 0.09342                     | 0.29371     | 0.12683                         | 0.25659                     | 0.18695                             | 0.04336                            | 0.35908                               | 1.36           |
| Erythorbic acid                     | A           | 0.018684                    | 0.029371    | 0.012683                        | 0.2488923                   | 0.018695                            | 0.004336                           | 0.035908                              | 0.369          |
| Isopropyl citrate                   | A           | 0.09342                     | 0.146855    | 0.063415                        | 0.128295                    | 0.093475                            | 0.02168                            | 0.17954                               | 0.727          |

| Compound                       | Group A/B * | 15-19 year olds             |             |                                 |                             |                                     |                                    |                                       | Maximum intake |
|--------------------------------|-------------|-----------------------------|-------------|---------------------------------|-----------------------------|-------------------------------------|------------------------------------|---------------------------------------|----------------|
|                                |             | I. Seasonings and beverages | II. Cereals | III. Potatoes, legumes and nuts | IV. Fish/shellfish and meat | V. Fats/oils and milk/milk products | VI. Sugar and confections/savories | VII. Fruits, vegetables, and seaweeds |                |
| L-Cysteine hydrochloride       | B           | 19.05768                    | 5.1         | 17.12205                        | 7.44111                     | 4.67375                             | 0.4                                | 17.7                                  | 71.5           |
| Butylated hydroxytoluene (BHT) | A           | 0.004671                    | 0.0146855   | * 0.012683                      | 0.0128295                   | 0.00467375                          | * 0.004336                         | * 0.035908                            | 0.0898         |
| d- $\alpha$ -Tocopherol        | B           | 0.924858                    | 0.7665831   | 0.2194159                       | 2.1989763                   | 4.29985                             | 0.724112                           | 0.5601648                             | 9.69           |
| d- $\beta$ -Tocopherol         | B           | 0.0336312                   | 0.0939872   | 0.0481954                       | 0.0153954                   | 0.108431                            | 0.0481296                          | * 0.0035908                           | 0.351          |
| d- $\gamma$ -Tocopherol        | B           | 0.5063364                   | 0.6725959   | 1.839035                        | 0.4644279                   | 6.99193                             | 0.810832                           | 0.053862                              | 11.3           |
| d- $\delta$ -Tocopherol        | B           | 0.7361496                   | 0.2555277   | 1.0095668                       | 0.0692793                   | 0.773973                            | 0.2046592                          | * 0.0035908                           | 3.05           |
| Butylated hydroxyanisole (BHA) | A           | 0.004671                    | * 0.029371  | * 0.012683                      | 0.0128295                   | 0.004336                            | * 0.035908                         | * 0.017954                            | 0.118          |
| Propyl gallate                 | A           | 0.09342                     | 0.29371     | 0.12683                         | 0.25659                     | 0.093475                            | 0.04336                            | * 0.71816                             | 1.63           |
| Nitrite                        | B           | 0.18684                     | 0.0146855   | 0.202928                        | * 0.025659                  | 0.0093475                           | 0.002168                           | 0.017954                              | 0.46           |
| Nitrate                        | B           | 2.05524                     | 0.499307    | 0.583418                        | 1.077678                    | 0.392595                            | 0.806496                           | 233.76108                             | 239            |
| Imazaryl                       | A           | 0.00018684                  | 0.0005874   | 0.00025366                      | 0.00051318                  | 0.00018695                          | 0.00008672                         | 0.00071816                            | 0.00253        |
| o-Phenylphenol (OPP)           | A           | 0.00037368                  | 0.0005874   | 0.00025366                      | 0.00051318                  | 0.0003739                           | 0.00008672                         | 0.00071816                            | 0.00291        |
| Diphenyl                       | A           | 0.00037368                  | 0.0005874   | 0.00025366                      | 0.00051318                  | 0.0003739                           | 0.00008672                         | 0.00071816                            | 0.00291        |
| Thiabendazole                  | A           | 0.000037368                 | 0.0001175   | 0.000050732                     | 0.000102636                 | 0.00003739                          | 0.000017344                        | 0.000718                              | 0.00108        |
| L-Aspartic acid                | B           | 89.49636                    | 36.71375    | 59.10278                        | 58.75911                    | 1.1217                              | 6.80752                            | 84.02472                              | 336            |
| DL-Alanine                     | B           | 127.61172                   | 6.6         | 32.08799                        | 223.74648                   | 1.68255                             | 1.60432                            | 103.41504                             | 497            |
| Disodium 5'-inosinate          | B           | 25.41024                    | 0.117484    | 0.050732                        | 0.846747                    | 0.03739                             | 0.017344                           | 0.143632                              | 26.6           |
| Disodium 5'-uridyate           | B           | 1.12104                     | 0.117484    | 0.050732                        | 0.128295                    | 0.056085                            | 0.073712                           | 0.143632                              | 1.69           |
| Disodium 5'-guanylate          | B           | 2.783916                    | 0.117484    | 0.050732                        | 0.102636                    | 0.03739                             | 0.082384                           | 0.143632                              | 3.32           |
| Glycine                        | B           | 50.82048                    | 25.25906    | 13.19032                        | 162.16488                   | 0.243035                            | 2.8184                             | 24                                    | 278            |
| L-Glutamic acid                | B           | 1150                        | 80.47654    | 105.64939                       | 279.6831                    | 2.3                                 | 20.29248                           | 128.55064                             | 1767           |
| Disodium 5'-cytidylate         | B           | 0.09342                     | 0.117484    | 0.050732                        | 0.102636                    | 0.03739                             | 0.052032                           | 0.143632                              | 0.597          |
| L-Theanine                     | B           | 7.9                         | * 0.58742   | 1.3                             | 1.28295                     | 0.093475                            | 0.04336                            | 1.07724                               | 12.3           |
| L-Isoleucine                   | B           | 70.81236                    | 0.58742     | 25.23917                        | 63.89091                    | 1                                   | * 0.08672                          | 27.64916                              | 189            |
| L-Tryptophan                   | B           | 2.05524                     | 2.9371      | 13.19032                        | 1.4                         | 0.3739                              | 0.78048                            | 5.5                                   | 26.2           |
| L-Threonine                    | B           | 54.93096                    | 1.7         | 22.70257                        | 5.2                         | 0.3739                              | 0.34688                            | 33.5                                  | 118            |
| L-Valine                       | B           | 76.23072                    | 2.7         | 37.79534                        | 88.01037                    | 4.1129                              | 0.17344                            | 42.73052                              | 252            |
| L-Histidine hydrochloride      | B           | 33.44436                    | 2.9371      | 17.50254                        | 175.50756                   | 0.7478                              | 0.17344                            | 29.44456                              | 260            |
| L-Phenylalanine                | B           | 68.00976                    | 7.2         | 48.57589                        | 76.72041                    | 2.2434                              | 1.17072                            | 37.34432                              | 241            |
| DL-Methionine                  | B           | 19.05768                    | 2.4         | 16.4879                         | 54.91026                    | 0.7478                              | 0.04336                            | 7.54068                               | 101            |
| L-Lysine hydrochloride         | B           | 76.79124                    | 6.75533     | 69.88333                        | 73.38474                    | 2.9                                 | 0.08672                            | 48.11672                              | 278            |
| L-Ascorbic acid                | B           | 22.23396                    | 0.558049    | 9.360054                        | 11.495232                   | 1.04692                             | 9.36576                            | 53.862                                | 108            |
| L-Ascorbyl stearate            | A           | 0.074736                    | 0.117484    | 0.050732                        | 0.102636                    | 0.07478                             | 0.017344                           | 0.143632                              | 0.581          |
| L-Ascorbyl palmitate           | A           | 0.074736                    | 0.117484    | 0.050732                        | 0.102636                    | 0.07478                             | 0.017344                           | 0.143632                              | 0.581          |
| Thiamine hydrochloride         | B           | 0.0952884                   | 0.2672761   | 0.0989274                       | 0.0128295                   | 0.059824                            | 0.0203792                          | 0.161586                              | 0.716          |
| Riboflavin                     | B           | 0.1606824                   | 0.1527292   | 0.1217568                       | 0.641475                    | 0.3570745                           | 0.0416256                          | 0.17954                               | 1.65           |
| Glycerol                       | B           | 305.172                     | 183.07923   | 93.8542                         | 60.7263                     | * 18.695                            | 14.3088                            | * 71.816                              | 748            |
| Silicone resin                 | A           | 0.18684                     | 0.29371     | 0.38049                         | 0.25659                     | 0.18695                             | 0.04336                            | 0.35908                               | 1.71           |
| Propylene glycol               | A           | 8.22096                     | 4.99307     | 0.25366                         | * 2.5659                    | * 18.695                            | 0.177776                           | 0.71816                               | 35.6           |
| Adipic acid                    | B           | 0.09342                     | 0.4092359   | 0.063415                        | 0.128295                    | 0.093475                            | 0.02168                            | 0.602057467                           | 1.41           |
| Citric acid                    | B           | 648.3348                    | * 5.8742    | 504.7834                        | * 5.1318                    | 249.2666667                         | 85.13013333                        | 332.7474667                           | 1831           |

| Compound                  | Group A/B * | 15-19 year olds             |             |                                 |                             |                                     |                                    |                                       | Maximum intake |
|---------------------------|-------------|-----------------------------|-------------|---------------------------------|-----------------------------|-------------------------------------|------------------------------------|---------------------------------------|----------------|
|                           |             | I. Seasonings and beverages | II. Cereals | III. Potatoes, legumes and nuts | IV. Fish/shellfish and meat | V. Fats/oils and milk/milk products | VI. Sugar and confections/savories | VII. Fruits, vegetables, and seaweeds |                |
| Gluconic acid             | B           | 34.313166                   | 4.9271811   | 7.10286049                      | 19.71004638                 | 4.621840217                         | 3.554941867                        | 29.16794871                           | 103            |
| Succinic acid             | B           | 122.6916                    | 41.1194     | * 2.5366                        | 2.5659                      | 10.59383333                         | 0.4336                             | 3.5908                                | 184            |
| L-Tartaric acid           | B           | 1.8684                      | 14.6855     | 1.2683                          | 19.6719                     | 47.98383333                         | 12.5744                            | 3.5908                                | 102            |
| Lactic acid               | B           | 166.9104                    | 832.17833   | 290.8634667                     | 610.6842                    | 117.1553333                         | 12.71893333                        | 198.6909333                           | 2229           |
| Acetic acid               | B           | 199.9188                    | 347.55683   | 58.97595                        | 91.26051                    | 33.21478333                         | 7.009866667                        | 68.46458667                           | 806            |
| Fumaric acid              | B           | 1.74384                     | 0.29371     | 3.720346667                     | 4.78968                     | * 0.7478                            | 1.82112                            | 21.30541333                           | 34.4           |
| DL-Malic acid             | B           | 743.6232                    | 53.846833   | 132.3259667                     | 50.4627                     | 1.8695                              | 38.5904                            | 354.2922667                           | 1375           |
| Calcium                   | B           | 51.81                       | 55.6        | 72.17                           | 89.5                        | 226.02                              | 23.31                              | 83.99                                 | 602            |
| Orthophosphoric acid      | A           | 141.9984                    | 323.081     | 152.196                         | 744.111                     | 336.51                              | 26.4496                            | 262.1284                              | 1986           |
| Aluminum                  | B           | 1.6118064                   | 0.8850461   | 0.236326567                     | 0.7090437                   | 0.054838667                         | 1.244432                           | 2.051543733                           | 6.79           |
| Iron                      | B           | 0.9883836                   | 1.2247707   | 1.3126905                       | 3.0200643                   | 0.168255                            | 0.433889067                        | 2.295718133                           | 9.44           |
| Magnesium                 | B           | 31.07                       | 74.84       | 58.47                           | 62.81                       | 21.03                               | 9.49                               | 59.61                                 | 317            |
| Nordihydroguaiaretic acid | B           | 0.9342                      | 1.46855     | 0.63415                         | 1.28295                     | 0.93475                             | 0.2168                             | 1.7954                                | 7.27           |
| Naringin                  | B           | 0.9342                      | 1.46855     | 0.63415                         | 1.28295                     | 0.93475                             | 0.2168                             | 1.7954                                | 7.27           |
| Hesperidine               | B           | 4.73844924                  | 1.46855     | 0.63415                         | 1.28295                     | 0.93475                             | 0.2168                             | 14.86938311                           | 24.1           |
| Kojic acid                | B           | 0.09342                     | 0.146855    | 0.063415                        | 0.128295                    | 0.093475                            | 0.02168                            | 0.17954                               | 0.727          |
| L-Asparagine              | B           | 7.84728                     | 1.17484     | 131.9032                        | 0.51318                     | 0.18695                             | 8.15168                            | 113.46928                             | 263            |
| L-Glutamine               | B           | 7.4736                      | 1.4         | 86.62489                        | 1.6                         | 0.18695                             | 0.17344                            | 535.0292                              | 632            |
| L-Arginine                | B           | 85.9464                     | 11.6        | 82.56633                        | 1.1                         | 0.093475                            | 3.9024                             | 118.4964                              | 303            |
| L-Cystine                 | B           | 0.09342                     | 0.29371     | 0.50732                         | 0.25659                     | 0.093475                            | 0.04336                            | 2                                     | 3.29           |
| L-Serine                  | B           | 83.1438                     | 6.46162     | 33.73678                        | 4                           | 0.56085                             | 1.21408                            | 58.88912                              | 188            |
| L-Hydroxyproline          | B           | 1                           | 0.58742     | 0.25366                         | 3.5                         | 0.3739                              | 0.099728                           | 0.71816                               | 6.53           |
| L-Tyrosine                | B           | 15.6                        | 7.2         | 37.54168                        | 3.9                         | 2.43035                             | 1.17072                            | 20.10848                              | 88             |
| L-Proline                 | B           | 89.12268                    | 5.2         | 26.6343                         | 44.39007                    | 4.6                                 | 2.2                                | 74.32956                              | 246            |
| L-Leucine                 | B           | 112.47768                   | 12.7        | 52.88811                        | 140.09814                   | 7.29105                             | 0.04336                            | 48.4758                               | 374            |

\* Group A/B: Food additives in Group A do not from naturally occur and those in Group B do.