Table 3. Dispensable amino acids of plants and produce items

Amino Acid, mg/g DM\*

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Alanine | Aspartate | Cystine | Glutamate | Glycine | Proline | Serine | Tyrosine |
| Land cress, *Barbarea verna* | 15.6 | 30.05 | 0.00 | 43.62 | 13.73 | 13.09 | 12.00 | 7.87 |
| Purple kale, *Brassica oleracea* | 10.98 | 19.39 | 0.77 | 89.95 | 5.41 | 3.27 | 8.02 | 3.72 |
| Dandelion, *Taraxacum officinale* | 13.44 | 21.33 | 1.15 | 27.31 | 11.47 | 13.53 | 10.63 | 8.96 |
| Red chard, *Beta vulgaris v. cicla* | 11.35 | 16.40 | 0.42 | 29.13 | 101.25 | 9.17 | 9.39 | 8.61 |
| Okra, *Abelmoschus esculentus* | 6.68 | 14.53 | 1.15 | 29.83 | 5.38 | 4.02 | 6.16 | 3.94 |
| Acai berry puree, *Euterpe oleracea* | 5.24 | 7.20 | 1.13 | 8.63 | 4.27 | 4.36 | 5.16 | 3.94 |
| Prickly pear, *Opuntia ficus-indica* (fruits) | 1.60 | 3.00 | 0.61 | 5.16 | 1.51 | 3.15 | 2.17 | 1.39 |
| Pomegranate, *Punica granatum* | 2.45 | 3.35 | 0.91 | 11.35 | 3.60 | 1.96 | 2.74 | 1.84 |
| Blueberry, *Vaccinium cyanococcus* | 1.66 | 2.28 | 0.92 | 4.71 | 1.33 | 0.63 | 1.58 | 1.10 |
| White sapote, *Casimiroa edulis* | 2.06 | 2.46 | 0.23 | 3.81 | 1.70 | 1.16 | 1.77 | 1.37 |
| Plum, *Prunus* spp. | 4.47 | 10.23 | 0.00 | 3.99 | 0.68 | 1.54 | 1.99 | 0.90 |
| Beet greens, *Beta vulgaris v. conditiva* | 9.44 | 11.46 | 0.34 | 26.20 | 9.02 | 6.42 | 7.98 | 6.54 |
| Beetroot, *Beta vulgaris v. conditiva* | 4.33 | 6.67 | 0.00 | 45.82 | 3.23 | 1.41 | 4.31 | 2.85 |
| Cherimoya, *Annona cherimola* | 4.71 | 3.69 | 0.22 | 7.37 | 2.56 | 14.39 | 2.48 | 1.96 |
| Jalepeno pepper, *Capsicum annum* | 6.70 | 21.11 | 1.49 | 21.53 | 6.07 | 5.11 | 6.93 | 4.88 |
| Eggplant, *Solanum melongena* | 5.86 | 12.44 | 0.66 | 24.14 | 4.61 | 3.95 | 4.82 | 3.82 |
| Taro root, *Colocasia esculenta* | 3.57 | 9.85 | 1.34 | 7.21 | 3.97 | 2.84 | 4.56 | 3.97 |
| Brewer's yeast, *Saccharomyces cerevisiae* | 32.97 | 44.00 | 2.72 | 83.77 | 24.55 | 22.00 | 25.14 | 19.51 |
| Duckweed, *Lemna* spp. | 11.55 | 13.30 | 1.11 | 16.78 | 10.21 | 7.88 | 8.67 | 8.01 |
| Cactus fruit, *Ferocactus* spp. | 4.18 | 5.71 | 2.48 | 18.16 | 8.10 | 5.11 | 4.09 | 4.73 |

DM, Dry matter

\*Sample for each amino acid determination analyzed in duplicate and reported as a mean value

Table 4. Dispensable amino acids of selected marine macroalgae and insects

Amino Acid, mg/g DM\*

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Alanine | Aspartate | Cystine | Glutamate | Glycine | Proline | Serine | Tyrosine |
| Chlorophyta (green algae) |  |  |  |  |  |  |  |  |
| *Ulva* spp. | 21.87 | 25.80 | 4.60 | 28.90 | 15.53 | 10.94 | 14.02 | 10.66 |
| Phaeophyta (brown algae) |  |  |  |  |  |  |  |  |
| *Eisenia arborea* | 12.73 | 20.54 | 8.56 | 21.40 | 19.58 | 12.07 | 13.38 | 8.69 |
| *Hedophyllum sessile* | 13.27 | 15.07 | 3.25 | 19.18 | 8.10 | 6.04 | 7.42 | 5.25 |
| *Dictyoneurum californicum* | 14.36 | 15.20 | 5.93 | 17.88 | 9.23 | 7.20 | 9.45 | 5.89 |
| *Macrocystis* spp. | 7.92 | 6.91 | 0.17 | 9.57 | 4.19 | 3.32 | 3.50 | 2.90 |
| *Laminaria* spp. | 14.29 | 14.21 | 3.36 | 14.26 | 6.89 | 5.76 | 7.30 | 5.03 |
| *Fucus gardneri* | 6.70 | 10.35 | 1.72 | 15.19 | 5.60 | 3.70 | 4.78 | 4.43 |
| *Egregria menziessii* | 11.51 | 17.12 | 4.63 | 18.67 | 7.63 | 5.60 | 7.88 | 5.88 |
| *Pelvetropsis limitata* | 5.41 | 10.17 | 2.13 | 11.89 | 4.86 | 3.17 | 4.57 | 4.42 |
| *Lessoniopsis littoralis* | 7.60 | 16.88 | 5.74 | 15.15 | 7.04 | 5.10 | 7.98 | 5.74 |
| *Pterygophora californica* | 7.71 | 12.48 | 3.25 | 26.06 | 4.85 | 2.42 | 5.94 | 4.88 |
| Rhodophyta (red algae) |  |  |  |  |  |  |  |  |
| *Mazzaella* spp. | 10.43 | 12.57 | 1.50 | 16.25 | 8.29 | 6.61 | 6.83 | 5.12 |
| *Palmaria hecatensis* | 16.16 | 23.55 | 3.97 | 23.66 | 13.69 | 11.18 | 11.50 | 9.14 |
| *Neorhodomela larix* | 8.11 | 17.17 | 4.58 | 18.21 | 9.11 | 37.84 | 7.32 | 10.20 |
| *Porphyra* spp. | 5.57 | 6.99 | 1.16 | 8.56 | 4.36 | 3.63 | 3.58 | 2.85 |
| *Cryptopleura ruprechtiana* | 12.96 | 23.64 | 11.79 | 21.18 | 14.69 | 29.63 | 16.63 | 13.60 |
| *Chondracanthus* spp. | 9.09 | 12.40 | 2.61 | 17.56 | 7.56 | 7.26 | 8.00 | 5.76 |
| *Prionotis* spp. | 17.66 | 26.25 | 7.37 | 34.43 | 17.07 | 15.18 | 13.62 | 8.70 |
| Insects |  |  |  |  |  |  |  |  |
| American cockroach, *Periplaneta americana* | 42.89 | 35.29 | 4.07 | 61.06 | 42.34 | 36.13 | 22.12 | 31.19 |
| Flesh fly, larva, *Sarcophaga (Neobelliaria) bullata* | 38.67 | 53.71 | 3.77 | 86.15 | 34.30 | 31.29 | 27.72 | 58.89 |
| Western harvester ant, *Pogonomyrmex occidentalis* | 54.76 | 36.04 | 1.93 | 68.04 | 64.73 | 43.20 | 26.65 | 26.52 |
| Flesh fly, adult, *Sarcophaga (Neobelliaria) bullata* | 41.32 | 53.71 | 6.61 | 91.20 | 32.85 | 52.41 | 28.16 | 38.81 |
| Black soldier fly, larva, *Hermetia illucens* | 33.78 | 30.34 | 3.86 | 52.08 | 27.14 | 24.15 | 18.60 | 26.96 |

DM, Dry matter

\*Sample for each amino acid determination analyzed in duplicate and reported as a mean value