**Table A: Total population and ethnic-specific plasma amino acid concentrations (µmol/L) within each trimester and comparison of median values between trimesters**

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | **Total Population (N=160)** | | **Hispanic Subjects (N=68)** | | **Non-Hispanic Subjects (N=91)** | | **Within-trimester Comparison†** | **Between-trimester Comparison‡** | | | |
| **Amino acid** | **Trimester** | **Median** | **IQR** | **Median** | **IQR** | **Median** | **IQR** | **P-value** | **Pair** | **Total population P-value** | **Hispanic subjects P-value** | **Non-Hispanic subjects P-value** |
| Alanine | T1 | 252.00 | 80.00 | 250.00 | 90.00 | 253.00 | 83.00 | 0.507 | T2-T1 | 0.325 | 0.666 | 0.066 |
|  | T2 | 263.00 | 76.50 | 262.00 | 81.00 | 265.00 | 76.00 | 0.355 | T3-T2 | 0.031 | 0.249 | 0.049 |
|  | T3 | 261.50 | 73.25 | 263.00 | 65.00 | 262.00 | 86.50 | 0.422 | T3-T1 | 0.090 | 0.884 | 0.024 |
| Arginine | T1 | 27.00 | 11.45 | 26.30 | 11.50 | 27.65 | 10.83 | 0.841 | T2-T1 | 2.000E-06 | 0.021 | 1.300E-05 |
|  | T2 | 24.10 | 9.10 | 25.40 | 9.70 | 23.20 | 9.00 | 0.057 | T3-T2 | 0.001 | 0.051 | 0.008 |
|  | T3 | 23.35 | 10.88 | 23.70 | 10.40 | 22.10 | 11.50 | 0.209 | T3-T1 | 2.543E-10 | 9.900E-05 | 4.204E-07 |
| Asparagine | T1 | 33.10 | 7.90 | 31.10 | 8.40 | 34.20 | 7.90 | 0.003 | T2-T1 | 1.000E-06 | 2.160E-04 | 0.001 |
|  | T2 | 36.00 | 9.70 | 34.00 | 8.55 | 37.60 | 7.80 | 0.008 | T3-T2 | 0.001 | 0.008 | 0.041 |
|  | T3 | 33.85 | 8.53 | 32.10 | 8.60 | 34.95 | 9.95 | 0.002 | T3-T1 | 0.222 | 0.418 | 0.289 |
| Aspartic acid | T1 | 7.37 | 2.44 | 6.79 | 2.30 | 7.58 | 2.41 | 0.008 | T2-T1 | 0.034 | 0.072 | 0.193 |
|  | T2 | 7.39 | 2.39 | 7.10 | 2.41 | 7.51 | 2.62 | 0.062 | T3-T2 | 0.090 | 0.289 | 0.199 |
|  | T3 | 7.64 | 2.67 | 7.29 | 2.20 | 7.83 | 3.15 | 0.015 | T3-T1 | 0.002 | 0.093 | 0.009 |
| Citrulline | T1 | 12.40 | 4.60 | 11.50 | 4.77 | 13.10 | 4.45 | 0.002 | T2-T1 | 0.026 | 0.291 | 0.064 |
|  | T2 | 12.40 | 3.85 | 11.40 | 3.35 | 13.00 | 4.80 | 0.013 | T3-T2 | 0.332 | 0.861 | 0.244 |
|  | T3 | 12.15 | 4.03 | 11.00 | 4.57 | 12.80 | 3.43 | 0.008 | T3-T1 | 0.011 | 0.473 | 0.005 |
| Glutamine | T1 | 397.00 | 81.00 | 378.00 | 74.50 | 413.00 | 86.50 | 0.011 | T2-T1 | 0.954 | 0.639 | 0.517 |
|  | T2 | 398.00 | 80.00 | 380.00 | 71.50 | 408.00 | 70.00 | 0.001 | T3-T2 | 0.001 | 0.028 | 0.028 |
|  | T3 | 388.50 | 88.00 | 367.00 | 66.00 | 402.00 | 98.25 | 0.001 | T3-T1 | 0.008 | 0.004 | 0.436 |
| Glutamic acid | T1 | 54.90 | 14.95 | 54.70 | 14.45 | 54.90 | 14.93 | 0.590 | T2-T1 | 0.898 | 0.344 | 0.268 |
|  | T2 | 53.40 | 15.80 | 53.50 | 16.50 | 53.20 | 14.50 | 0.735 | T3-T2 | 1.096E-08 | 0.002 | 1.000E-06 |
|  | T3 | 60.15 | 19.03 | 60.20 | 19.20 | 59.95 | 18.05 | 0.504 | T3-T1 | 3.018E-08 | 1.540E-04 | 5.400E-05 |
| Glycine | T1 | 120.00 | 44.75 | 115.00 | 38.60 | 131.00 | 43.50 | 0.001 | T2-T1 | 1.310E-04 | 0.181 | 1.810E-04 |
|  | T2 | 116.00 | 39.50 | 106.50 | 36.58 | 123.00 | 37.00 | 0.002 | T3-T2 | 8.000E-05 | 0.065 | 0.001 |
|  | T3 | 112.00 | 40.95 | 103.00 | 33.40 | 117.00 | 45.93 | 0.012 | T3-T1 | 3.772E-09 | 4.960E-04 | 5.000E-06 |
| Isoleucine | T1 | 37.70 | 9.83 | 36.40 | 7.625 | 38.00 | 10.10 | 0.337 | T2-T1 | 0.106 | 0.274 | 0.275 |
|  | T2 | 36.30 | 9.60 | 35.90 | 8.50 | 37.90 | 10.50 | 0.191 | T3-T2 | 0.074 | 0.740 | 0.046 |
|  | T3 | 35.10 | 11.20 | 34.50 | 11.40 | 35.50 | 10.65 | 0.645 | T3-T1 | 0.002 | 0.176 | 0.006 |
| Leucine | T1 | 78.80 | 20.03 | 76.65 | 23.83 | 80.80 | 19.30 | 0.302 | T2-T1 | 6.700E-05 | 0.181 | 1.120E-04 |
|  | T2 | 74.20 | 20.25 | 75.75 | 18.80 | 74.00 | 20.80 | 0.883 | T3-T2 | 2.930E-04 | 0.078 | 0.001 |
|  | T3 | 71.75 | 19.83 | 73.20 | 20.00 | 70.45 | 19.45 | 0.431 | T3-T1 | 2.388E-09 | 0.002 | 4.092E-07 |
| Methionine | T1 | 15.00 | 3.45 | 14.95 | 2.38 | 15.05 | 4.23 | 0.593 | T2-T1 | 0.006 | 0.586 | 0.005 |
|  | T2 | 14.70 | 3.40 | 14.70 | 2.53 | 14.65 | 3.78 | 0.911 | T3-T2 | 0.893 | 0.347 | 0.428 |
|  | T3 | 14.60 | 3.50 | 14.80 | 3.00 | 14.50 | 3.73 | 0.381 | T3-T1 | 0.001 | 0.373 | 0.001 |
| Ornithine | T1 | 33.20 | 14.60 | 32.10 | 16.40 | 35.40 | 13.95 | 0.099 | T2-T1 | 0.013 | 0.052 | 0.135 |
|  | T2 | 30.60 | 11.35 | 29.00 | 9.33 | 32.00 | 14.20 | 0.002 | T3-T2 | 0.231 | 0.434 | 0.277 |
|  | T3 | 31.74 | 10.25 | 28.35 | 10.50 | 32.05 | 11.65 | 0.003 | T3-T1 | 4.720E-04 | 0.005 | 0.021 |
| Phenylalanine | T1 | 42.15 | 9.88 | 40.75 | 9.17 | 42.30 | 10.95 | 0.159 | T2-T1 | 1.890E-04 | 0.564 | 5.000E-05 |
|  | T2 | 39.90 | 8.80 | 39.60 | 8.85 | 40.50 | 8.40 | 0.893 | T3-T2 | 0.521 | 0.457 | 0.136 |
|  | T3 | 39.40 | 7.85 | 41.00 | 9.20 | 38.50 | 6.45 | 0.255 | T3-T1 | 1.030E-04 | 0.547 | 2.400E-05 |
| Proline | T1 | 118.00 | 50.20 | 123.00 | 45.70 | 112.00 | 53.15 | 0.405 | T2-T1 | 0.463 | 0.614 | 0.278 |
|  | T2 | 115.00 | 46.00 | 119.00 | 49.00 | 114.00 | 44.00 | 0.149 | T3-T2 | 0.064 | 0.093 | 0.432 |
|  | T3 | 119.50 | 41.93 | 123.00 | 39.00 | 114.00 | 44.33 | 0.030 | T3-T1 | 0.915 | 0.582 | 0.608 |
| Tryptophan | T1 | 44.55 | 8.85 | 43.30 | 8.00 | 45.60 | 9.53 | 0.322 | T2-T1 | 1.083E-08 | 0.003 | 9.762E-07 |
|  | T2 | 40.20 | 8.90 | 40.50 | 8.55 | 40.10 | 9.70 | 0.715 | T3-T2 | 3.555E-10 | 7.500E-05 | 2.000E-06 |
|  | T3 | 36.25 | 6.80 | 36.80 | 7.00 | 35.95 | 6.65 | 0.597 | T3-T1 | 4.840E-19 | 2.661E-08 | 4.995E-12 |
| Serine | T1 | 61.10 | 20.80 | 60.20 | 25.45 | 61.80 | 20.15 | 0.887 | T2-T1 | 2.498E-09 | 6.800E-05 | 9.000E-06 |
|  | T2 | 54.70 | 15.00 | 52.45 | 15.25 | 55.70 | 12.75 | 0.232 | T3-T2 | 0.481 | 0.271 | 0.043 |
|  | T3 | 52.60 | 15.35 | 51.80 | 16.60 | 52.60 | 15.35 | 0.902 | T3-T1 | 6.650E-12 | 4.600E-05 | 4.678E-08 |
| Threonine | T1 | 106.00 | 38.20 | 106.00 | 46.15 | 106.00 | 34.35 | 0.586 | T2-T1 | 5.143E-14 | 3.000E-06 | 6.819E-10 |
|  | T2 | 124.00 | 50.50 | 119.00 | 52.00 | 131.50 | 48.45 | 0.450 | T3-T2 | 5.000E-06 | 0.002 | 0.001 |
|  | T3 | 136.50 | 56.75 | 141.00 | 55.00 | 136.00 | 55.00 | 0.748 | T3-T1 | 3.910E-18 | 2.481E-09 | 1.766E-10 |
| Tyrosine | T1 | 35.40 | 9.60 | 35.80 | 8.10 | 35.00 | 10.60 | 0.781 | T2-T1 | 3.729E-08 | 0.004 | 3.000E-06 |
|  | T2 | 33.25 | 6.75 | 33.85 | 6.68 | 32.50 | 6.80 | 0.729 | T3-T2 | 0.315 | 0.044 | 0.754 |
|  | T3 | 33.10 | 7.75 | 34.50 | 7.20 | 32.20 | 7.63 | 0.039 | T3-T1 | 2.000E-06 | 0.076 | 8.000E-06 |
| Valine | T1 | 141.00 | 31.75 | 138.00 | 34.50 | 141.00 | 29.00 | 0.229 | T2-T1 | 0.003 | 0.426 | 0.003 |
|  | T2 | 137.00 | 28.50 | 136.00 | 25.50 | 138.00 | 34.00 | 0.689 | T3-T2 | 3.487E-08 | 1.200E-05 | 2.690E-04 |
|  | T3 | 127.00 | 28.25 | 127.00 | 29.00 | 126.00 | 24.50 | 0.665 | T3-T1 | 9.859E-13 | 1.000E-05 | 4.577E-08 |
| Cysteine | T1 | 14.10 | 8.56 | 14.50 | 6.91 | 13.90 | 8.85 | 0.950 | T2-T1 | 1.200E-05 | 0.017 | 8.400E-05 |
|  | T2 | 12.70 | 7.81 | 13.40 | 7.02 | 11.60 | 7.14 | 0.316 | T3-T2 | 0.149 | 0.236 | 0.424 |
|  | T3 | 13.35 | 7.59 | 13.70 | 6.46 | 13.15 | 9.66 | 0.864 | T3-T1 | 9.460E-07 | 0.001 | 2.710E-04 |
| Taurine | T1 | 1.56 | 0.59 | 1.68 | 0.77 | 1.50 | 0.57 | 0.092 | T2-T1 | 5.041E-10 | 2.000E-06 | 5.500E-05 |
|  | T2 | 1.32 | 0.14 | 1.32 | 0.33 | 38.35 | 0.40 | 0.550 | T3-T2 | 0.007 | 0.302 | 0.010 |
|  | T3 | 1.23 | 0.34 | 1.27 | 0.34 | 1.21 | 0.37 | 0.357 | T3-T1 | 2.359E-09 | 7.500E-05 | 1.200E-05 |
| Sum of essential AA excluding BCAA | T1 | 205.70 | 45.55 | 204.90 | 43.75 | 206.20 | 46.78 | 0.859 | T2-T1 | 4.000E-06 | 0.003 | 2.170E-04 |
|  | T2 | 213.50 | 64.50 | 210.65 | 66.78 | 220.15 | 65.75 | 0.488 | T3-T2 | 0.008 | 0.023 | 0.166 |
|  | T3 | 227.00 | 66.23 | 230.30 | 70.70 | 221.80 | 65.28 | 0.977 | T3-T1 | 4.448E-10 | 3.000E-06 | 1.000E-05 |
| Sum of essential AA including BCAA | T1 | 472.50 | 81.65 | 468.40 | 87.53 | 472.60 | 122.40 | 0.554 | T2-T1 | 0.743 | 0.952 | 0.952 |
|  | T2 | 473.90 | 101.20 | 456.85 | 97.15 | 484.50 | 109.13 | 0.632 | T3-T2 | 0.141 | 0.128 | 0.128 |
|  | T3 | 464.60 | 95.28 | 469.00 | 116.70 | 463.05 | 92.88 | 0.750 | T3-T1 | 0.292 | 0.189 | 0.189 |
| Sum of non-essential AA | T1 | 1192.86 | 209.98 | 1169.25 | 247.43 | 1199.30 | 219.04 | 0.336 | T2-T1 | 0.060 | 0.224 | 0.238 |
|  | T2 | 1168.90 | 193.37 | 1127.18 | 179.68 | 1198.54 | 210.94 | 0.016 | T3-T2 | 0.562 | 0.426 | 0.853 |
|  | T3 | 1156.40 | 221.39 | 1129.50 | 176.71 | 1190.63 | 243.28 | 0.056 | T3-T1 | 0.151 | 0.148 | 0.613 |
| Sum of BCAA | T1 | 256.50 | 59.48 | 250.05 | 65.53 | 259.60 | 55.20 | 0.202 | T2-T1 | 4.590E-04 | 0.217 | 0.001 |
|  | T2 | 249.05 | 51.33 | 245.85 | 55.38 | 250.10 | 50.90 | 0.860 | T3-T2 | 3.000E-06 | 0.002 | 4.420E-04 |
|  | T3 | 233.55 | 53.38 | 238.70 | 50.20 | 232.25 | 51.43 | 0.617 | T3-T1 | 4.901E-11 | 1.200E-04 | 1.546E-07 |
| AA, amino acids; BCAA, branched-chain amino acids; IQR, inter-quartile range. †P-values represent difference in median metabolite values within a given trimester between ethnic groups, calculated by Mann-Whitney U test. ‡P-values represent difference in median metabolite values between paired trimesters, calculated by Wilcoxon Rank test separately for total population, Hispanic subjects and non-Hispanic subjects. Significance set at p<0.05. Bonferroni correction for multiple comparisons (N=97\*3 timepoints =291) implies values are statistically significant where p <0.00017 (1.7E-4). | | | | | | | | | | | | |

**Table B:** **Total population and ethnic-specific plasma NEFA concentrations (µmol/L) within each trimester and comparison of median values between trimesters**

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | **Total Population (N=160)** | | **Hispanic Subjects (N=68)** | | **Non-Hispanic Subjects (N=91)** | | **Within-trimester Comparison†** | **Between-trimester Comparison‡** | | | |
| **NEFA** | **Trimester** | **Median** | **IQR** | **Median** | **IQR** | **Median** | **IQR** | **P-value** | **Pair** | **Total population P-value** | **Hispanic subjects P-value** | **Non-Hispanic subjects P-value** |
| C11:0 | T1 | 0.01 | 0.02 | 0.01 | 0.02 | 0.01 | 0.02 | 0.540 | T2-T1 | 0.353 | 0.158 | 1.000 |
|  | T2 | 0.00 | 0.02 | 0.00 | 0.01 | 0.01 | 0.03 | 0.014 | T3-T2 | 0.593 | 0.896 | 0.343 |
|  | T3 | 0.00 | 0.02 | 0.00 | 0.01 | 0.01 | 0.02 | 0.050 | T3-T1 | 0.082 | 0.110 | 0.223 |
| C12:0 | T1 | 1.59 | 1.03 | 1.66 | 0.80 | 1.53 | 1.15 | 0.910 | T2-T1 | 0.226 | 0.913 | 0.078 |
|  | T2 | 1.41 | 0.94 | 1.39 | 0.85 | 1.49 | 1.01 | 0.860 | T3-T2 | 0.028 | 0.405 | 0.046 |
|  | T3 | 1.58 | 1.23 | 1.43 | 1.25 | 1.66 | 1.09 | 0.126 | T3-T1 | 0.107 | 0.550 | 0.189 |
| C14:0 | T1 | 5.09 | 4.02 | 5.43 | 3.51 | 4.77 | 4.19 | 0.258 | T2-T1 | 0.088 | 0.118 | 0.250 |
|  | T2 | 4.96 | 3.30 | 4.62 | 2.69 | 5.09 | 4.03 | 0.771 | T3-T2 | 0.009 | 0.380 | 0.010 |
|  | T3 | 5.96 | 3.95 | 5.25 | 3.40 | 6.68 | 4.02 | 0.059 | T3-T1 | 0.227 | 0.452 | 0.043 |
| C14:1 | T1 | 0.88 | 0.77 | 0.96 | 0.75 | 0.78 | 0.79 | 0.210 | T2-T1 | 0.001 | 0.002 | 0.058 |
|  | T2 | 0.80 | 0.61 | 0.81 | 0.50 | 0.71 | 0.67 | 0.890 | T3-T2 | 0.539 | 0.618 | 0.252 |
|  | T3 | 0.87 | 0.71 | 0.76 | 0.53 | 0.98 | 0.79 | 0.035 | T3-T1 | 0.039 | 4.190E-04 | 0.916 |
| C15:0 | T1 | 0.93 | 0.56 | 0.99 | 0.46 | 0.86 | 0.61 | 0.340 | T2-T1 | 0.017 | 0.044 | 0.094 |
|  | T2 | 0.86 | 0.45 | 0.84 | 0.39 | 0.89 | 0.59 | 0.905 | T3-T2 | 0.036 | 0.546 | 0.038 |
|  | T3 | 0.93 | 0.59 | 0.88 | 0.50 | 1.03 | 0.66 | 0.101 | T3-T1 | 0.870 | 0.153 | 0.411 |
| C16:0 | T1 | 64.20 | 36.80 | 68.20 | 32.65 | 55.80 | 38.05 | 0.061 | T2-T1 | 0.019 | 0.039 | 0.154 |
|  | T2 | 58.85 | 26.93 | 60.00 | 25.93 | 53.90 | 29.50 | 0.186 | T3-T2 | 0.001 | 0.113 | 0.003 |
|  | T3 | 68.35 | 32.60 | 68.90 | 31.60 | 67.30 | 33.28 | 0.587 | T3-T1 | 0.331 | 0.344 | 0.054 |
| C16:1 | T1 | 8.20 | 7.34 | 9.61 | 7.53 | 7.65 | 6.78 | 0.042 | T2-T1 | 0.003 | 0.001 | 0.228 |
|  | T2 | 7.28 | 6.10 | 7.91 | 5.35 | 7.19 | 6.60 | 0.298 | T3-T2 | 0.034 | 0.292 | 0.053 |
|  | T3 | 8.69 | 6.83 | 8.32 | 7.13 | 9.47 | 6.89 | 0.391 | T3-T1 | 0.323 | 0.006 | 0.289 |
| C17:0 | T1 | 1.35 | 0.69 | 1.41 | 0.54 | 1.28 | 0.84 | 0.133 | T2-T1 | 0.019 | 0.065 | 0.091 |
|  | T2 | 1.27 | 0.57 | 7.91 | 0.50 | 1.24 | 0.60 | 0.340 | T3-T2 | 0.021 | 0.476 | 0.023 |
|  | T3 | 1.38 | 0.66 | 1.38 | 0.59 | 1.39 | 0.75 | 0.548 | T3-T1 | 0.945 | 0.153 | 0.324 |
| C17:1 | T1 | 0.67 | 0.50 | 0.74 | 0.40 | 0.58 | 0.55 | 0.035 | T2-T1 | 0.003 | 0.003 | 0.120 |
|  | T2 | 0.60 | 0.40 | 0.63 | 0.37 | 0.60 | 0.40 | 0.446 | T3-T2 | 0.064 | 0.642 | 0.060 |
|  | T3 | 0.67 | 0.47 | 0.65 | 0.45 | 0.68 | 0.50 | 0.365 | T3-T1 | 0.156 | 0.001 | 0.548 |
| C18:0 | T1 | 25.00 | 11.30 | 25.00 | 8.90 | 25.60 | 13.80 | 0.265 | T2-T1 | 0.243 | 0.368 | 0.346 |
|  | T2 | 24.35 | 11.25 | 25.35 | 9.10 | 23.40 | 12.30 | 0.194 | T3-T2 | 0.004 | 0.450 | 0.004 |
|  | T3 | 26.35 | 11.48 | 25.70 | 11.60 | 27.45 | 11.68 | 0.507 | T3-T1 | 0.061 | 0.770 | 0.043 |
| C18:1 | T1 | 93.80 | 59.60 | 101.00 | 48.20 | 86.70 | 65.40 | 0.101 | T2-T1 | 0.008 | 0.012 | 0.139 |
|  | T2 | 83.95 | 52.90 | 84.65 | 48.15 | 79.00 | 48.90 | 0.376 | T3-T2 | 0.011 | 0.203 | 0.022 |
|  | T3 | 97.50 | 53.80 | 93.40 | 57.50 | 100.50 | 52.68 | 0.360 | T3-T1 | 0.827 | 0.068 | 0.292 |
| C18:2 | T1 | 44.20 | 28.20 | 48.10 | 28.50 | 39.80 | 28.95 | 0.019 | T2-T1 | 0.002 | 0.012 | 0.032 |
|  | T2 | 38.75 | 23.25 | 41.00 | 18.05 | 35.20 | 24.60 | 0.056 | T3-T2 | 0.259 | 0.734 | 0.262 |
|  | T3 | 41.95 | 22.50 | 43.40 | 21.40 | 39.95 | 23.85 | 0.706 | T3-T1 | 0.112 | 0.017 | 0.801 |
| C18:3 | T1 | 4.19 | 2.85 | 4.52 | 2.89 | 3.79 | 2.41 | 0.095 | T2-T1 | 0.006 | 0.018 | 0.076 |
|  | T2 | 3.75 | 2.24 | 3.77 | 1.92 | 3.69 | 2.87 | 0.422 | T3-T2 | 0.332 | 0.679 | 0.351 |
|  | T3 | 4.13 | 2.41 | 4.06 | 2.20 | 4.30 | 2.67 | 0.518 | T3-T1 | 0.169 | 0.020 | 0.918 |
| C20:1 | T1 | 0.76 | 0.55 | 0.80 | 0.47 | 0.73 | 0.49 | 0.069 | T2-T1 | 0.090 | 0.021 | 0.634 |
|  | T2 | 0.74 | 0.45 | 0.79 | 0.42 | 0.72 | 0.50 | 0.410 | T3-T2 | 0.003 | 0.069 | 0.026 |
|  | T3 | 0.86 | 0.46 | 0.82 | 0.36 | 0.88 | 0.50 | 0.624 | T3-T1 | 0.228 | 0.527 | 0.063 |
| C20:2 | T1 | 0.74 | 0.45 | 0.86 | 0.46 | 0.66 | 0.42 | 0.003 | T2-T1 | 0.005 | 0.009 | 0.095 |
|  | T2 | 0.68 | 0.45 | 0.71 | 0.44 | 0.60 | 0.46 | 0.010 | T3-T2 | 0.765 | 0.528 | 0.387 |
|  | T3 | 0.71 | 0.41 | 0.58 | 0.41 | 0.71 | 0.45 | 0.471 | T3-T1 | 0.045 | 0.009 | 0.678 |
| C20:3 | T1 | 0.68 | 0.41 | 0.81 | 0.41 | 0.63 | 0.41 | 0.019 | T2-T1 | 9.000E-06 | 4.910E-04 | 0.001 |
|  | T2 | 0.59 | 0.34 | 0.62 | 0.28 | 0.56 | 0.35 | 0.096 | T3-T2 | 0.777 | 0.392 | 0.774 |
|  | T3 | 0.59 | 0.32 | 0.58 | 0.27 | 0.60 | 0.34 | 0.953 | T3-T1 | 5.300E-05 | 3.140E-04 | 0.027 |
| C20:4 | T1 | 1.63 | 0.98 | 1.64 | 0.93 | 1.62 | 0.97 | 0.708 | T2-T1 | 1.186E-11 | 2.000E-06 | 4.341E-07 |
|  | T2 | 1.25 | 0.77 | 1.19 | 0.48 | 1.25 | 0.82 | 0.559 | T3-T2 | 0.214 | 0.268 | 0.484 |
|  | T3 | 1.21 | 0.75 | 1.14 | 0.55 | 1.35 | 0.88 | 0.067 | T3-T1 | 1.225E-11 | 1.000E-06 | 1.000E-06 |
| C20:5 | T1 | 0.11 | 0.10 | 0.10 | 0.08 | 0.14 | 0.13 | 0.031 | T2-T1 | 2.151E-08 | 1.100E-05 | 8.300E-05 |
|  | T2 | 0.10 | 0.08 | 0.08 | 0.06 | 0.11 | 0.09 | 0.003 | T3-T2 | 0.502 | 0.768 | 0.509 |
|  | T3 | 0.09 | 0.10 | 0.07 | 0.06 | 0.12 | 0.11 | 0.004 | T3-T1 | 2.000E-06 | 0.001 | 1.250E-04 |
| C22:4 | T1 | 0.39 | 0.23 | 0.42 | 0.23 | 0.34 | 0.23 | 0.032 | T2-T1 | 7.000E-06 | 2.430E-04 | 0.003 |
|  | T2 | 0.32 | 0.19 | 0.33 | 0.19 | 0.31 | 0.20 | 0.341 | T3-T2 | 0.753 | 0.310 | 0.642 |
|  | T3 | 0.32 | 0.19 | 0.31 | 0.13 | 0.34 | 0.23 | 0.370 | T3-T1 | 6.800E-05 | 7.700E-05 | 0.060 |
| C22:5 | T1 | 0.55 | 0.34 | 0.56 | 0.31 | 0.53 | 0.38 | 0.567 | T2-T1 | 2.000E-06 | 1.710E-04 | 0.001 |
|  | T2 | 0.45 | 0.27 | 0.45 | 0.22 | 0.43 | 0.35 | 0.643 | T3-T2 | 0.718 | 0.610 | 0.936 |
|  | T3 | 0.45 | 0.28 | 0.41 | 0.22 | 0.48 | 0.35 | 0.127 | T3-T1 | 5.200E-05 | 0.001 | 0.014 |
| C22:6 | T1 | 1.25 | 0.93 | 1.16 | 0.63 | 1.30 | 1.16 | 0.144 | T2-T1 | 0.001 | 0.002 | 0.042 |
|  | T2 | 1.15 | 0.62 | 1.01 | 0.47 | 1.30 | 0.86 | 0.005 | T3-T2 | 0.832 | 0.777 | 0.906 |
|  | T3 | 1.08 | 0.81 | 0.95 | 0.66 | 1.26 | 1.04 | 0.004 | T3-T1 | 0.002 | 0.007 | 0.055 |
| Sum of saturated NEFA | T1 | 99.43 | 51.00 | 103.31 | 46.31 | 89.16 | 58.49 | 0.105 | T2-T1 | 0.043 | 0.095 | 0.162 |
|  | T2 | 91.90 | 43.71 | 96.43 | 37.09 | 87.29 | 50.55 | 0.218 | T3-T2 | 0.002 | 0.170 | 0.004 |
|  | T3 | 106.16 | 50.94 | 106.01 | 47.08 | 106.14 | 51.54 | 0.440 | T3-T1 | 0.191 | 0.561 | 0.043 |
| Sum of monounsaturated NEFA | T1 | 103.82 | 66.25 | 112.55 | 54.28 | 94.35 | 70.52 | 0.068 | T2-T1 | 0.004 | 0.008 | 0.094 |
|  | T2 | 91.82 | 57.69 | 94.42 | 55.28 | 90.36 | 55.28 | 0.291 | T3-T2 | 0.011 | 0.287 | 0.015 |
|  | T3 | 108.17 | 62.57 | 102.96 | 60.62 | 114.25 | 61.98 | 0.285 | T3-T1 | 0.694 | 0.024 | 0.249 |
| Sum of polyunsaturated NEFA | T1 | 53.49 | 31.99 | 57.48 | 31.97 | 50.27 | 31.56 | 0.023 | T2-T1 | 0.001 | 0.008 | 0.011 |
|  | T2 | 47.00 | 28.15 | 49.39 | 21.20 | 43.17 | 29.29 | 0.082 | T3-T2 | 0.218 | 0.728 | 0.197 |
|  | T3 | 50.15 | 26.31 | 51.70 | 24.44 | 49.56 | 27.68 | 0.937 | T3-T1 | 0.075 | 0.010 | 0.804 |
| IQR, inter-quartile range; NEFA, non-esterified fatty acids. †P-values represent difference in median metabolite values within a given trimester between ethnic groups, calculated by Mann-Whitney U test. ‡P-values represent difference in median metabolite values between paired trimesters, calculated by Wilcoxon Rank test separately for total population, Hispanic subjects and non-Hispanic subjects. Significance set at p<0.05. Bonferroni correction for multiple comparisons (N=97\*3 timepoints =291) implies values are statistically significant where p <0.00017 (1.7E-4). | | | | | | | | | | | | |

**Table C: Total population and ethnic-specific metabolic ratios as indicators of BCAA and fatty acid metabolism within each trimester and comparison of median values between trimesters**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  | **Total Population (N=160)** | | **Hispanic Subjects (N=68)** | | **Non-Hispanic Subjects (N=91)** | | **Within-trimester Comparison†** | **Between-trimester Comparison‡** | | | |
| **Ratio** | **Interpretation** | **Trimester** | **Median** | **IQR** | **Median** | **IQR** | **Median** | **IQR** | **p-value** | **Pair** | **Total population P-value** | **Hispanic subjects P-value** | **Non-Hispanic subjects P-value** |
| Carn.a.C14/Carn | CPT-1 rate | T1 | 0.001 | 0.0008 | 0.001 | 0.0007 | 0.001 | 0.0008 | 0.943 | T2-T1 | 0.378 | 0.615 | 0.200 |
|  |  | T2 | 0.002 | 0.0002 | 0.002 | 0.0003 | 0.001 | 0.0008 | 0.546 | T3-T2 | 4.457E-07 | 1.260E-04 | 0.001 |
|  |  | T3 | 0.002 | 0.0010 | 0.002 | 0.0001 | 0.002 | 0.0010 | 0.407 | T3-T1 | 5.077E-07 | 0.001 | 3.700E-04 |
| Carn.a.C16/Carn | CPT-1 rate | T1 | 0.003 | 0.0001 | 0.003 | 0.0009 | 0.003 | 0.0012 | 0.597 | T2-T1 | 7.974E-08 | 1.700E-05 | 0.001 |
|  |  | T2 | 0.003 | 0.0012 | 0.003 | 0.0013 | 0.003 | 0.0012 | 0.221 | T3-T2 | 2.000E-06 | 0.013 | 4.200E-05 |
|  |  | T3 | 0.004 | 0.0018 | 0.004 | 0.0017 | 0.004 | 0.0019 | 0.402 | T3-T1 | 7.803E-14 | 1.500E-05 | 2.443E-09 |
| Carn.a.C18/Carn | CPT-1 rate | T1 | 0.001 | 0.0007 | 0.001 | 0.0007 | 0.001 | 0.0007 | 0.388 | T2-T1 | 5.818E-07 | 8.800E-05 | 0.002 |
|  |  | T2 | 0.001 | 0.0008 | 0.001 | 0.0008 | 0.005 | 0.0007 | 0.792 | T3-T2 | 0.058 | 0.277 | 0.167 |
|  |  | T3 | 0.002 | 0.0009 | 0.001 | 0.0007 | 0.006 | 0.0009 | 0.344 | T3-T1 | 1.210E-08 | 2.720E-04 | 2.100E-05 |
| Carn.a.C18.1/Carn | CPT-1 rate | T1 | 0.004 | 0.0022 | 0.004 | 0.0019 | 0.004 | 0.0023 | 0.959 | T2-T1 | 7.000E-06 | 0.011 | 3.710E-04 |
|  |  | T2 | 0.005 | 0.0021 | 0.005 | 0.0020 | 0.005 | 0.0020 | 0.321 | T3-T2 | 1.900E-05 | 0.006 | 0.001 |
|  |  | T3 | 0.006 | 0.0025 | 0.005 | 0.0020 | 0.006 | 0.0029 | 0.010 | T3-T1 | 1.967E-11 | 3.04E-04 | 3.574E-08 |
| Carn.a.C18.2/Carn | CPT-1 rate | T1 | 0.003 | 0.0017 | 0.003 | 0.0016 | 0.003 | 0.0018 | 0.654 | T2-T1 | 0.001 | 0.007 | 0.030 |
|  |  | T2 | 0.004 | 0.0019 | 0.004 | 0.019 | 0.004 | 0.0018 | 0.357 | T3-T2 | 0.005 | 0.361 | 0.004 |
|  |  | T3 | 0.004 | 0.0022 | 0.004 | 0.0019 | 0.004 | 0.0022 | 0.285 | T3-T1 | 2.245E-08 | 0.005 | 3.000E-06 |
| Carn.a.C2/Carn.a.C14 | β-Oxidation | T1 | 145.40 | 68.75 | 153.54 | 73.27 | 134.95 | 68.42 | 0.323 | T2-T1 | 0.429 | 0.546 | 0.136 |
|  |  | T2 | 137.43 | 63.14 | 145.15 | 72.48 | 134.30 | 65.58 | 0.126 | T3-T2 | 0.001 | 0.018 | 0.019 |
|  |  | T3 | 115.29 | 54.51 | 122.97 | 48.52 | 114.40 | 56.92 | 0.407 | T3-T1 | 3.200E-05 | 0.020 | 0.001 |
| Carn.a.C2/Carn.a.C16 | β-Oxidation | T1 | 74.80 | 28.92 | 74.24 | 28.28 | 74.84 | 28.33 | 0.744 | T2-T1 | 1.222E-07 | 6.700E-05 | 3.410E-04 |
|  |  | T2 | 61.79 | 25.27 | 64.38 | 23.05 | 60.86 | 28.23 | 0.656 | T3-T2 | 0.005 | 0.119 | 0.017 |
|  |  | T3 | 56.53 | 20.73 | 58.31 | 22.92 | 55.38 | 18.49 | 0.407 | T3-T1 | 2.703E-12 | 2.600E-05 | 4.059E-08 |
| Carn.a.C2/Carn.a.C18 | β-Oxidation | T1 | 186.50 | 110.20 | 195.52 | 117.19 | 181.21 | 95.52 | 0.094 | T2-T1 | 8.100E-05 | 0.002 | 0.015 |
|  |  | T2 | 161.88 | 85.21 | 166.67 | 85.42 | 156.50 | 78.93 | 0.402 | T3-T2 | 0.658 | 0.708 | 0.912 |
|  |  | T3 | 148.76 | 79.30 | 164.84 | 76.36 | 144.73 | 77.10 | 0.237 | T3-T1 | 2.200E-05 | 0.001 | 0.009 |
| Carn.a.C2/Carn.a.C18.1 | β-Oxidation | T1 | 48.44 | 18.82 | 50.73 | 18.32 | 47.43 | 21.78 | 0.339 | T2-T1 | 1.320E-07 | 0.010 | 4.000E-06 |
|  |  | T2 | 40.70 | 15.50 | 44.85 | 15.86 | 39.40 | 13.77 | 0.015 | T3-T2 | 0.014 | 0.084 | 0.101 |
|  |  | T3 | 38.81 | 18.50 | 41.26 | 15.00 | 35.91 | 20.10 | 0.014 | T3-T1 | 1.095E-09 | 0.001 | 2.292E-07 |
| Carn.a.C2/Carn.a.C18.2 | β-Oxidation | T1 | 62.19 | 28.84 | 64.61 | 21.73 | 58.36 | 33.00 | 0.262 | T2-T1 | 3.452E-04 | 0.013 | 0.021 |
|  |  | T2 | 53.92 | 30.26 | 56.89 | 26.14 | 52.92 | 31.30 | 0.933 | T3-T2 | 0.089 | 0.680 | 0.065 |
|  |  | T3 | 51.72 | 28.56 | 53.90 | 28.03 | 50.14 | 29.43 | 0.307 | T3-T1 | 2.300E-05 | 0.028 | 2.650E-04 |
| Carn, acylcarnitine; CPT, carnitine palmitoyl transferase; IQR, inter-quartile range. †P-values represent difference in median metabolite values within a given trimester between ethnic groups, calculated by Mann-Whitney U test. ‡P-values represent difference in median metabolite values between paired trimesters, calculated by Wilcoxon Rank test separately for total population, Hispanic subjects and non-Hispanic subjects. Significance set at p<0.05. Bonferroni correction for multiple comparisons (N=97\*3 timepoints =291) implies values are statistically significant where p <0.00017 (1.7E-4). | | | | | | | | | | | | | |

**Table D: Total population and ethnic-specific plasma concentrations (µmol/L) of metabolites generated through processes of ketogenesis and oxidation of glucose, amino acids and fatty acids, within each trimester and comparison of median values between trimesters**

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | **Total Population (N=160)** | | **Hispanic Subjects (N=68)** | | **Non-Hispanic Subjects (N=91)** | | **Within-trimester Comparison†** | **Between-trimester Comparison‡** | | | |
| **Metabolite** | **Trimester** | **Median** | **IQR** | **Median** | **IQR** | **Median** | **IQR** | **P-value** | **Pair** | **Total population P-value** | **Hispanic subjects P-value** | **Non-Hispanic subjects P-value** |
| Citric acid | T1 | 5.23 | 1.01 | 5.84 | 1.92 | 5.33 | 2.02 | 0.007 | T2-T1 | 2.700E-05 | 0.015 | 0.001 |
|  | T2 | 6.29 | 2.58 | 6.72 | 2.60 | 6.16 | 2.42 | 0.136 | T3-T2 | 4.850E-09 | 1.200E-05 | 8.400E-05 |
|  | T3 | 7.49 | 2.83 | 7.84 | 2.64 | 7.43 | 2.56 | 0.093 | T3-T1 | 8.395E-16 | 6.642E-07 | 4.711E-10 |
| Isocitric acid | T1 | 0.07 | 0.09 | 0.06 | 0.09 | 0.07 | 0.09 | 0.820 | T2-T1 | 0.332 | 0.192 | 0.821 |
|  | T2 | 0.08 | 0.08 | 0.10 | 0.09 | 0.07 | 0.08 | 0.104 | T3-T2 | 0.001 | 0.024 | 0.013 |
|  | T3 | 0.10 | 0.10 | 0.11 | 0.10 | 0.10 | 0.09 | 0.373 | T3-T1 | 1.180E-04 | 0.001 | 0.024 |
| Alpha-ketoglutaric acid | T1 | 1.87 | 0.56 | 1.94 | 0.61 | 1.80 | 0.53 | 0.477 | T2-T1 | 0.022 | 0.090 | 0.171 |
|  | T2 | 2.01 | 0.65 | 2.07 | 0.59 | 1.93 | 0.68 | 0.178 | T3-T2 | 0.115 | 0.870 | 0.042 |
|  | T3 | 2.03 | 0.53 | 2.07 | 0.92 | 2.02 | 0.55 | 0.896 | T3-T1 | 1.680E-04 | 0.050 | 0.002 |
| Succinic acid | T1 | 3.87 | 1.30 | 3.81 | 1.13 | 3.96 | 1.34 | 0.594 | T2-T1 | 0.002 | 0.003 | 0.122 |
|  | T2 | 3.63 | 1.24 | 3.41 | 1.58 | 3.74 | 1.14 | 0.049 | T3-T2 | 0.872 | 0.914 | 0.830 |
|  | T3 | 3.60 | 1.25 | 3.32 | 1.42 | 3.62 | 1.25 | 0.045 | T3-T1 | 0.035 | 0.014 | 0.557 |
| Fumaric acid | T1 | 0.17 | 0.06 | 0.17 | 0.05 | 0.17 | 0.08 | 0.888 | T2-T1 | 0.002 | 0.069 | 0.012 |
|  | T2 | 0.18 | 0.07 | 0.18 | 0.08 | 0.18 | 0.07 | 0.602 | T3-T2 | 2.530E-04 | 0.003 | 0.033 |
|  | T3 | 0.21 | 0.09 | 0.21 | 0.09 | 0.21 | 0.09 | 0.736 | T3-T1 | 4.438E-07 | 0.002 | 1.270E-04 |
| Malic acid | T1 | 0.48 | 0.16 | 0.51 | 0.17 | 0.47 | 0.15 | 0.722 | T2-T1 | 0.150 | 0.676 | 0.147 |
|  | T2 | 0.49 | 0.14 | 0.49 | 0.17 | 0.51 | 0.13 | 0.306 | T3-T2 | 1.593E-08 | 2.200E-05 | 1.870E-05 |
|  | T3 | 0.56 | 0.21 | 0.57 | 0.21 | 0.56 | 0.21 | 0.725 | T3-T1 | 8.787E-09 | 3.820E-04 | 7.000E-06 |
| Pyruvic acid | T1 | 303.00 | 123.00 | 312.50 | 121.75 | 295.00 | 116.00 | 0.193 | T2-T1 | 0.511 | 0.496 | 0.186 |
|  | T2 | 293.50 | 118.50 | 292.00 | 116.50 | 294.00 | 120.00 | 0.897 | T3-T2 | 0.032 | 0.116 | 0.174 |
|  | T3 | 318.50 | 113.25 | 323.50 | 104.50 | 315.00 | 120.00 | 0.632 | T3-T1 | 0.001 | 0.154 | 0.004 |
| Lactic acid | T1 | 1690.00 | 605.00 | 1730.00 | 590.00 | 1680.00 | 635.00 | 0.766 | T2-T1 | 0.297 | 0.459 | 0.041 |
|  | T2 | 1675.00 | 645.00 | 1365.00 | 690.00 | 1700.00 | 630.00 | 0.320 | T3-T2 | 0.048 | 0.210 | 0.144 |
|  | T3 | 1820.00 | 652.50 | 1750.00 | 585.00 | 1890.00 | 700.00 | 0.522 | T3-T1 | 0.001 | 0.098 | 0.003 |
| Methyl malonic acid | T1 | 0.41 | 0.22 | 0.40 | 0.22 | 0.42 | 0.22 | 0.493 | T2-T1 | 0.308 | 0.178 | 0.828 |
|  | T2 | 0.39 | 0.11 | 0.37 | 0.28 | 0.39 | 0.21 | 0.440 | T3-T2 | 0.166 | 0.183 | 0.463 |
|  | T3 | 0.41 | 0.23 | 0.40 | 0.24 | 0.41 | 0.22 | 0.749 | T3-T1 | 0.750 | 0.664 | 0.589 |
| 3-methyl-2-oxobutanoic acid | T1 | 32.95 | 8.25 | 33.50 | 9.55 | 31.40 | 7.60 | 0.091 | T2-T1 | 0.003 | 0.011 | 0.045 |
|  | T2 | 30.00 | 8.30 | 30.45 | 8.28 | 29.75 | 8.43 | 0.311 | T3-T2 | 0.332 | 0.694 | 0.283 |
|  | T3 | 30.10 | 9.18 | 31.30 | 8.20 | 28.75 | 8.50 | 0.040 | T3-T1 | 0.006 | 0.099 | 0.012 |
| 3-methyl-2-oxovalveric acid | T1 | 41.60 | 10.55 | 38.80 | 13.60 | 41.90 | 8.88 | 0.929 | T2-T1 | 4.000E-06 | 0.001 | 0.002 |
|  | T2 | 38.50 | 11.70 | 38.50 | 9.35 | 38.35 | 11.88 | 0.548 | T3-T2 | 0.893 | 0.926 | 0.636 |
|  | T3 | 39.30 | 11.20 | 39.40 | 11.60 | 38.90 | 10.60 | 0.608 | T3-T1 | 0.001 | 0.079 | 0.001 |
| 4-methyl-2-oxovalveric acid | T1 | 67.10 | 15.30 | 64.50 | 17.00 | 69.00 | 14.80 | 0.445 | T2-T1 | 7.846E-09 | 2.330E-04 | 3.000E-06 |
|  | T2 | 59.30 | 14.70 | 57.35 | 12.93 | 60.30 | 15.45 | 0.372 | T3-T2 | 0.724 | 0.753 | 0.503 |
|  | T3 | 59.35 | 14.53 | 59.90 | 13.00 | 57.45 | 16.48 | 0.480 | T3-T1 | 4.499E-07 | 0.005 | 7.000E-06 |
| Alpha-aminoadipic acid | T1 | 0.17 | 0.03 | 0.18 | 0.07 | 0.17 | 0.07 | 0.121 | T2-T1 | 0.909 | 0.478 | 0.303 |
|  | T2 | 0.18 | 0.06 | 0.18 | 0.06 | 0.17 | 0.06 | 0.480 | T3-T2 | 0.283 | 0.717 | 0.313 |
|  | T3 | 0.18 | 0.07 | 0.19 | 0.06 | 0.18 | 0.07 | 0.747 | T3-T1 | 0.210 | 0.589 | 0.279 |
| Beta-hydroxybutyric acid | T1 | 47.85 | 53.50 | 47.50 | 56.10 | 48.85 | 50.48 | 0.224 | T2-T1 | 0.869 | 0.739 | 0.950 |
|  | T2 | 50.00 | 39.60 | 53.40 | 41.40 | 42.95 | 36.95 | 0.138 | T3-T2 | 3.000E-06 | 0.021 | 5.100E-05 |
|  | T3 | 66.80 | 68.33 | 65.65 | 48.73 | 66.20 | 72.15 | 0.838 | T3-T1 | 0.001 | 0.058 | 0.006 |
| IQR, inter-quartile range. †P-values represent difference in median metabolite values within a given trimester between ethnic groups, calculated by Mann-Whitney U test. ‡P-values represent difference in median metabolite values between paired trimesters, calculated by Wilcoxon Rank test separately for total population, Hispanic subjects and non-Hispanic subjects. Significance set at p<0.05. Bonferroni correction for multiple comparisons (N=97\*3 timepoints =291) implies values are statistically significant where p <0.00017 (1.7E-4). | | | | | | | | | | | | |