**Supplementary table 1.** Baseline values (median, IQR) and change from baseline to end of study (median, IQR) for IDL and LDL subclass particles and lipid concentrations (n=54).

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Lipid measure (mmol/L) | HOSO  |   | Oxidized FO |   | High quality FO | Difference between groups\* |
| Baseline |   | change |   | Baseline |   | change |   | Baseline |   | change |
| median | IQR |   | median | IQR |   | median | IQR |   | median | IQR |   | median | IQR |   | median | IQR | P-value (ANOVA) |
| IDL-P | 8.8E-5 | 2.7E-5 |  | 3.5E-6 | 2.1E-5 |  | 8.6E-5 | 3.3E-5 |  | 9.8E-6 | 1.3E-5 |  | 8.3E-5 | 2.6E-5 |  | -3.0E-6 | 2.0E-5 | 0.023† |
| IDL-L | 0.866 | 0.27 |  | 0.036 | 0.23 |  | 0.866 | 0.33 |  | 0.098 | 0.13 |  | 0.847 | 0.28 |  | -0.036 | 0.2 | 0.023 † |
| IDL-PL | 0.241 | 0.07 |  | 0.008 | 0.07 |  | 0.234 | 0.08 |  | 0.027 | 0.03 |  | 0.239 | 0.07 |  | -0.009 | 0.05 | 0.021 † |
| IDL-C | 0.544 | 0.20 |  | 0.032 | 0.18 |  | 0.550 | 0.21 |  | 0.070 | 0.1 |  | 0.541 | 0.23 |  | -0.022 | 0.13 | 0.016 † |
| IDL-CE | 0.406 | 0.13 |  | 0.028 | 0.12 |  | 0.408 | 0.15 |  | 0.038 | 0.08 |  | 0.383 | 0.18 |  | -0.021 | 0.09 | 0.013 † |
| IDL-FC | 0.154 | 0.06 |  | 0.006 | 0.05 |  | 0.152 | 0.05 |  | 0.024 | 0.03 |  | 0.155 | 0.05 |  | -0.004 | 0.03 | 0.027 ‡ |
| IDL-TG | 0.077 | 0.03 |  | 0.002 | 0.02 |  | 0.074 | 0.03 |  | 0.006 | 0.02 |  | 0.072 | 0.03 |  | 0.003 | 0.02 | 0.243 |
| L-LDL-P | 1.4E-4 | 4.6E-5 |  | 7.6E-6 | 4.2E-5 |  | 1.4E-4 | 5.6E-5 |  | 1.7E-5 | 2.2E-5 |  | 1.3E-4 | 5.0E-5 |  | -5.1E-6 | 3.7E-5 | 0.018 † |
| L-LDL-L | 1.009 | 0.32 |  | 0.052 | 0.3 |  | 1.026 | 0.39 |  | 0.117 | 0.16 |  | 0.961 | 0.37 |  | -0.033 | 0.26 | 0.017 † |
| L-LDL-PL | 0.265 | 0.07 |  | 0.012 | 0.07 |  | 0.270 | 0.08 |  | 0.018 | 0.04 |  | 0.261 | 0.08 |  | -0.010 | 0.06 | 0.012 † |
| L-LDL-C | 0.686 | 0.22 |  | 0.044 | 0.22 |  | 0.693 | 0.27 |  | 0.079 | 0.13 |  | 0.643 | 0.31 |  | -0.024 | 0.19 | 0.015 † |
| L-LDL-CE | 0.484 | 0.16 |  | 0.033 | 0.16 |  | 0.505 | 0.21 |  | 0.051 | 0.11 |  | 0.443 | 0.23 |  | -0.021 | 0.15 | 0.014 † |
| L-LDL-FC | 0.201 | 0.07 |  | 0.011 | 0.06 |  | 0.193 | 0.06 |  | 0.027 | 0.03 |  | 0.200 | 0.07 |  | -0.005 | 0.04 | 0.020 ‡ |
| L-LDL-TG | 0.068 | 0.03 |  | 0.001 | 0.02 |  | 0.057 | 0.03 |  | 0.008 | 0.02 |  | 0.058 | 0.02 |  | 0.006 | 0.02 | 0.157 |
| M-LDL-P | 1.1E-4 | 3.8E-5 |  | 5.4E-6 | 2.8E-5 |  | 1.2E-4 | 5.0E-5 |  | 1.5E-5 | 2.3E-5 |  | 1.0E-4 | 4.1E-5 |  | -3.6E-6 | 3.1E-5 | 0.020 ‡ |
| M-LDL-L | 0.586 | 0.20 |  | 0.025 | 0.14 |  | 0.605 | 0.24 |  | 0.076 | 0.12 |  | 0.537 | 0.22 |  | -0.018 | 0.16 | 0.018 ‡ |
| M-LDL-PL | 0.162 | 0.04 |  | 0.026 | 0.03 |  | 0.172 | 0.05 |  | 0.006 | 0.03 |  | 0.154 | 0.04 |  | -0.004 | 0.03 | 0.007 † |
| M-LDL-C | 0.395 | 0.17 |  | 0.009 | 0.1 |  | 0.400 | 0.17 |  | 0.058 | 0.08 |  | 0.352 | 0.18 |  | -0.014 | 0.12 | 0.022 ‡ |
| M-LDL-CE | 0.278 | 0.14 |  | 0.004 | 0.09 |  | 0.285 | 0.14 |  | 0.046 | 0.07 |  | 0.241 | 0.14 |  | -0.011 | 0.09 | 0.027 ‡ |
| M-LDL-FC | 0.115 | 0.03 |  | 0.005 | 0.02 |  | 0.116 | 0.03 |  | 0.011 | 0.02 |  | 0.113 | 0.03 |  | -0.004 | 0.02 | 0.010 † |
| M-LDL-TG | 0.035 | 0.01 |  | 0.000 | 0.01 |  | 0.029 | 0.02 |  | 0.003 | 0.01 |  | 0.030 | 0.01 |  | 0.002 | 0.01 | 0.145 |
| S-LDL-P | 1.3E-4 | 4.1E-5 |  | 8.4E-6 | 3.0E-5 |  | 1.4E-4 | 5.6E-5 |  | 1.5E-5 | 2.8E-5 |  | 1.2E-4 | 4.3E-5 |  | -3.1E-6 | 3.2E-5 | 0.018 ‡ |
| S-LDL-L | 0.374 | 0.11 |  | 0.022 | 0.08 |  | 0.391 | 0.15 |  | 0.045 | 0.08 |  | 0.353 | 0.13 |  | -0.009 | 0.09 | 0.016 ‡ |
| S-LDL-PL | 0.121 | 0.02 |  | 0.005 | 0.02 |  | 0.122 | 0.04 |  | 0.004 | 0.02 |  | 0.118 | 0.02 |  | -0.003 | 0.02 | 0.007 † |
| S-LDL-C | 0.240 | 0.11 |  | 0.003 | 0.07 |  | 0.238 | 0.10 |  | 0.039 | 0.05 |  | 0.219 | 0.11 |  | -0.010 | 0.07 | 0.023 ‡ |
| S-LDL-CE | 0.171 | 0.09 |  | 0.000 | 0.06 |  | 0.169 | 0.08 |  | 0.029 | 0.04 |  | 0.150 | 0.09 |  | -0.009 | 0.05 | 0.027 ‡ |
| S-LDL-FC | 0.067 | 0.01 |  | 0.004 | 0.01 |  | 0.070 | 0.02 |  | 0.008 | 0.01 |  | 0.067 | 0.02 |  | -0.002 | 0.01 | 0.013 ‡ |
| S-LDL-TG | 0.021 | 0.01 |  | -0.001 | 0.01 |  | 0.019 | 0.01 |  | 0.000 | 0.01 |  | 0.019 | 0.01 |  | 0.001 | 0.00 | 0.709 |

HOSO, high oleic sunflower oil, FO, fish oil, IQR, interquartile range, IDL, intermediate density lipoprotein, P, particle concentration, L, total lipids, PL, phospholipids, C, cholesterol CE, cholesteryl ester, FC, free cholesterol, TG, triglycerides, LDL, low density lipoprotein

\* P-value for between group differences determined with one-way ANOVA on log2-transformed variables.

† P<0.05 for change in high quality FO group compared to oxidized FO and HOSO groups (Tukey post hoc analyses).

‡ P<0.05 for change in high quality FO group compared to oxidized FO group (Tukey post hoc analyses).

**Supplementary table 2.** Baseline values (mean, SD) and change from baseline to end of study (mean, SD) for lipids measured with NMR (n=54).

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|   | HOSO |   | Oxidized FO |   | High quality FO  | Difference between groups |
| Baseline |   | Change |   | Baseline |   | Change |   | Baseline |   | Change |
| Mean  | SD |   | Mean | SD |   | Mean  | SD |   | Mean | SD |   | Mean  | SD |   | Mean | SD | P-value\* (ANOVA) |
| Total-C (mmol/L) | 3.73 | 0.81 |  | 0.33 | 0.61 |  | 3.64 | 0.76 |  | 0.41 | 0.48 |  | 3.64 | 0.67 |  | -0.09 | 0.39 | 0.011 † |
| Triglycerides (mmol/L) | 1.13 | 0.61 |  | -0.07 | 0.40 |  | 1.05 | 0.62 |  | -0.19 | 0.37 |  | 0.86 | 0.31 |  | -0.05 | 0.19 | 0.389 |
| ApoA1 (g/L) | 1.45 | 0.20 |  | 0.04 | 0.08 |  | 1.42 | 0.18 |  | 0.06 | 0.09 |  | 1.43 | 0.15 |  | 0.01 | 0.11 | 0.291 |
| ApoB (g/L) | 0.75 | 0.13 |  | 0.04 | 0.11 |  | 0.73 | 0.18 |  | 0.02 | 0.08 |  | 0.70 | 0.16 |  | -0.04 | 0.07 | 0.031 ‡ |
| VLDL-C (mmol/L) | 0.53 | 0.18 |  | 0.02 | 0.13 |  | 0.50 | 0.25 |  | -0.01 | 0.11 |  | 0.43 | 0.18 |  | -0.03 | 0.08 | 0.462 |
| Remnant-C (mmol/L) | 1.09 | 0.26 |  | 0.09 | 0.22 |  | 1.05 | 0.35 |  | 0.07 | 0.17 |  | 0.97 | 0.31 |  | -0.05 | 0.14 | 0.050 |
| LDL-C (mmol/L) | 1.25 | 0.44 |  | 0.19 | 0.45 |  | 1.25 | 0.39 |  | 0.23 | 0.33 |  | 1.27 | 0.40 |  | -0.08 | 0.21 | 0.019§ |
| HDL-C (mmol/L) | 1.38 | 0.33 |  | 0.05 | 0.10 |  | 1.34 | 0.32 |  | 0.11 | 0.13 |  | 1.40 | 0.27 |  | 0.05 | 0.16 | 0.273 |
| non-HDL-C (mmol/L) | 2.35 | 0.63 |  | 0.28 | 0.63 |  | 2.30 | 0.70 |  | 0.30 | 0.46 |  | 2.25 | 0.70 |  | -0.14 | 0.33 | 0.018 † |

HOSO, high oleic sunflower oil, FO, fish oil, C, cholesterol, Apo, apolipoprotein, VLDL, very low density lipoprotein, LDL, low density lipoprotein, HDL, high-density lipoprotein

**\*** P-value determined with one-way ANOVA.

† P<0.05 for change in high quality FO group compared to both oxidized FO and HOSO groups (Tukey post hoc analyses).

‡ P<0.05 for the change in high quality FO group compared to HOSO group (Tukey post hoc analyses).

§ P<0.05 for change in high quality FO group compared to oxidized FO group (Tukey post hoc analyses).