# Supplemental Materials

## Effects of replacing dietary monounsaturated fat with carbohydrate on HDL protein metabolism and proteome composition in humans

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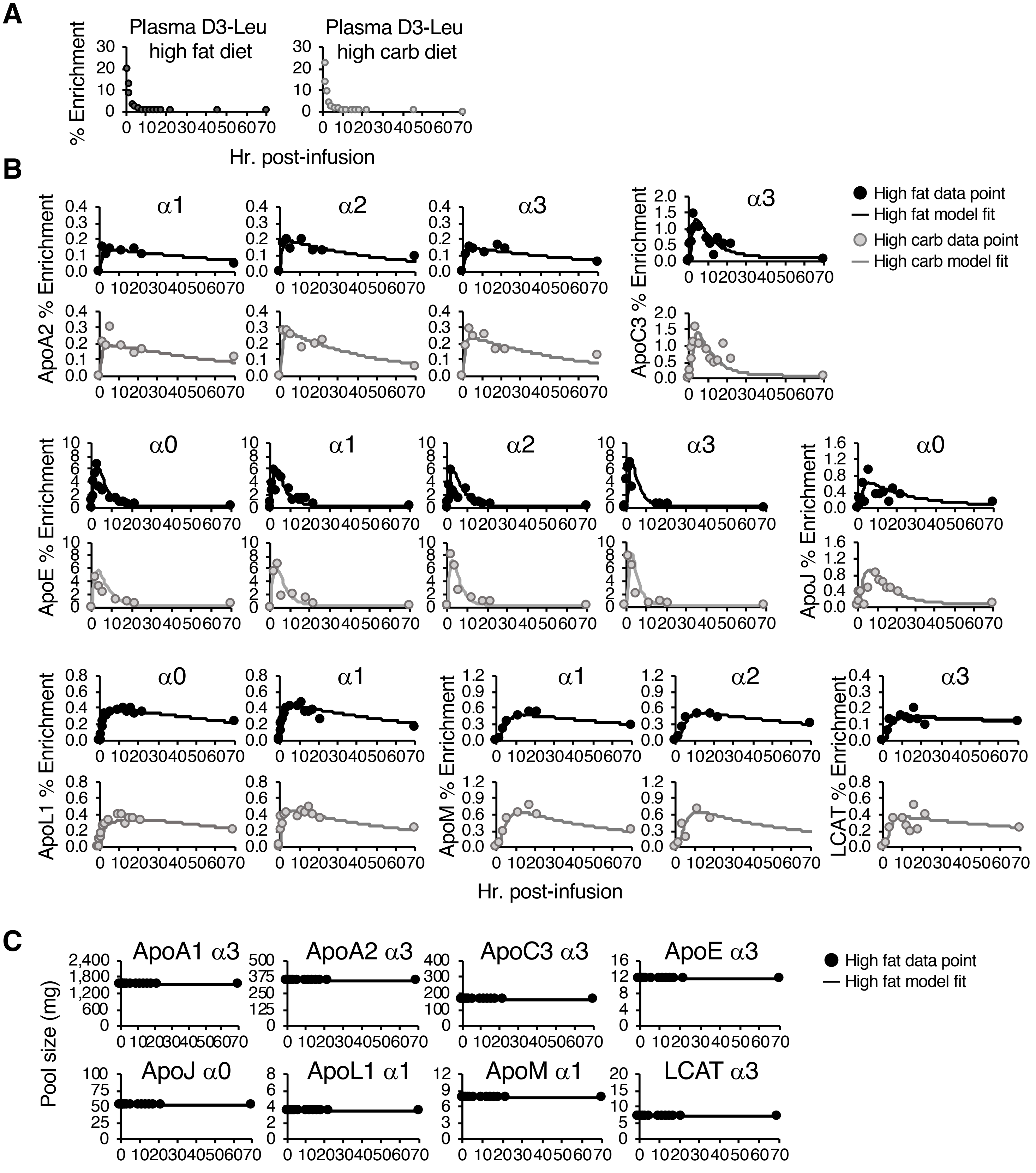
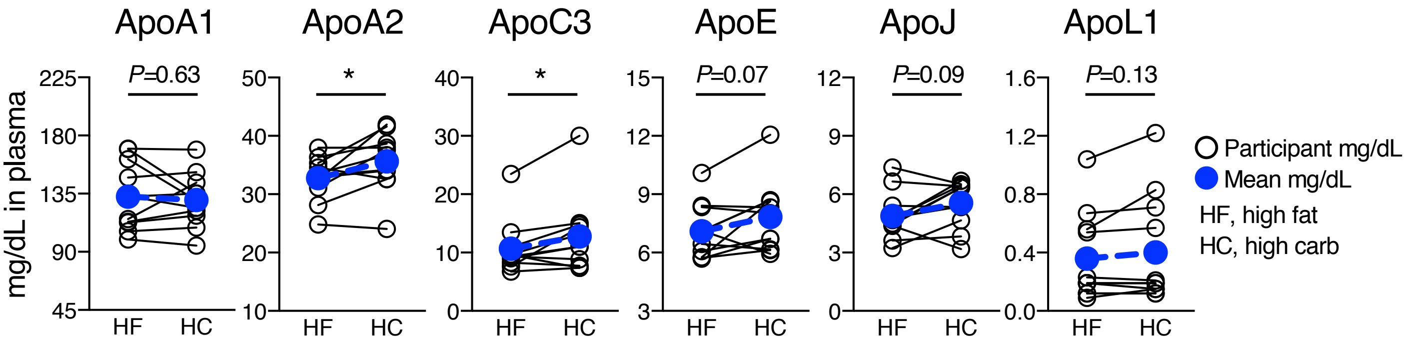
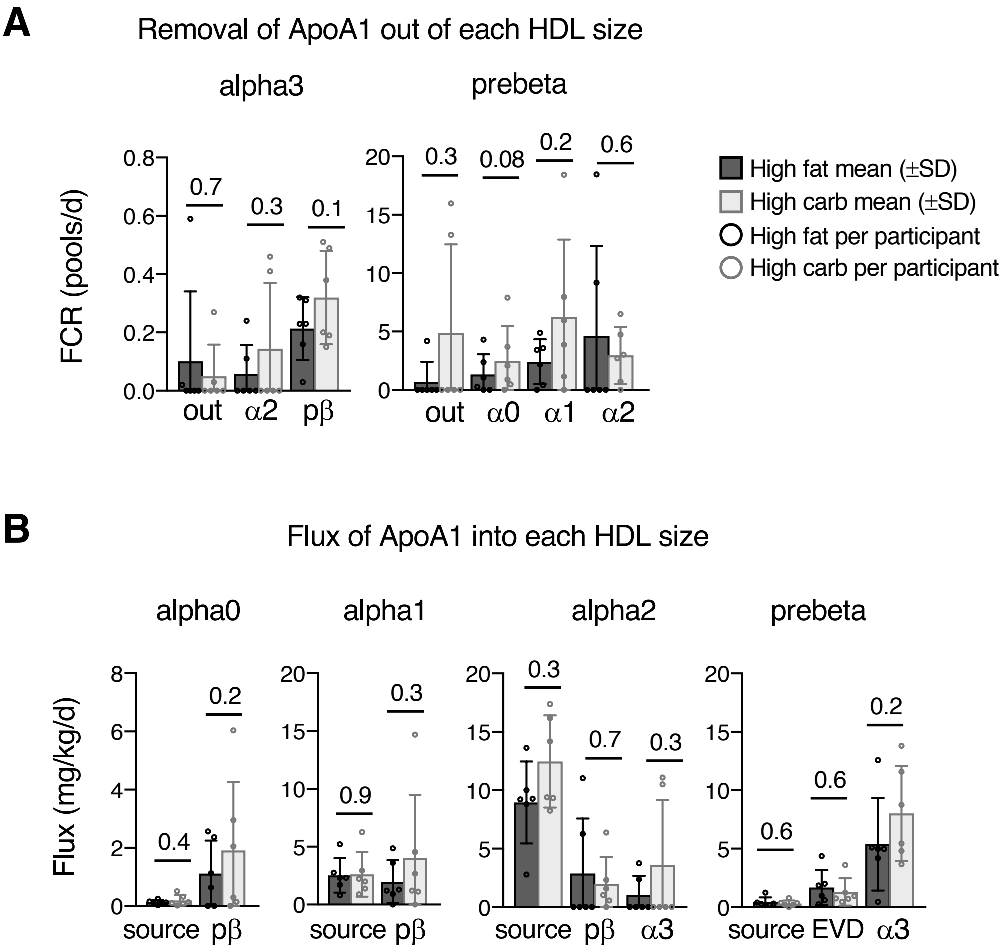


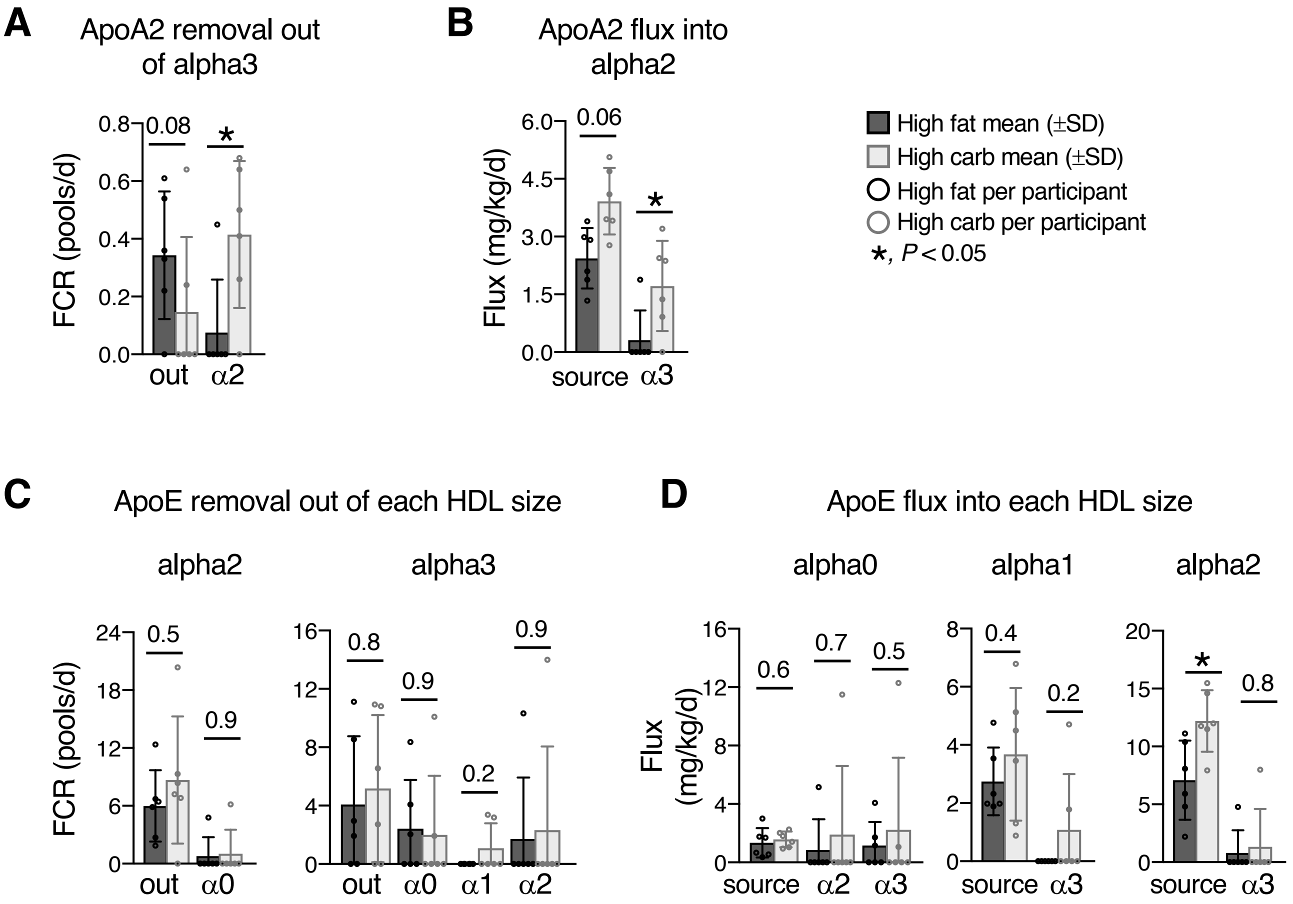
**Supplemental Figure I. Tracer enrichment and pool size model fits for HDL proteins.** (**A**) Representative plasma D3-Leu tracer enrichment curves. Plasma D3-Leu enrichment was the input for each kinetic model and describes the behavior of the amino acid precursor pool (D3-Leu tracer enrichment in plasma). The same plasma D3-Leu enrichment curve was used for all 8 protein models per participant per diet. Representative enrichment curve (**B**) and pool size (**C**) model fits for ApoA2, ApoC3, ApoE, ApoJ, ApoL1, ApoM, and LCAT. ApoA1 enrichment curve model fits are shown in **Figure 4A**. Fits were generated using the kinetic models shown in **Figures 4-6**. Model fits are from one representative participant (#6), with the exception of ApoA2 and ApoM in which participant #1 and 3 were used, respectively.



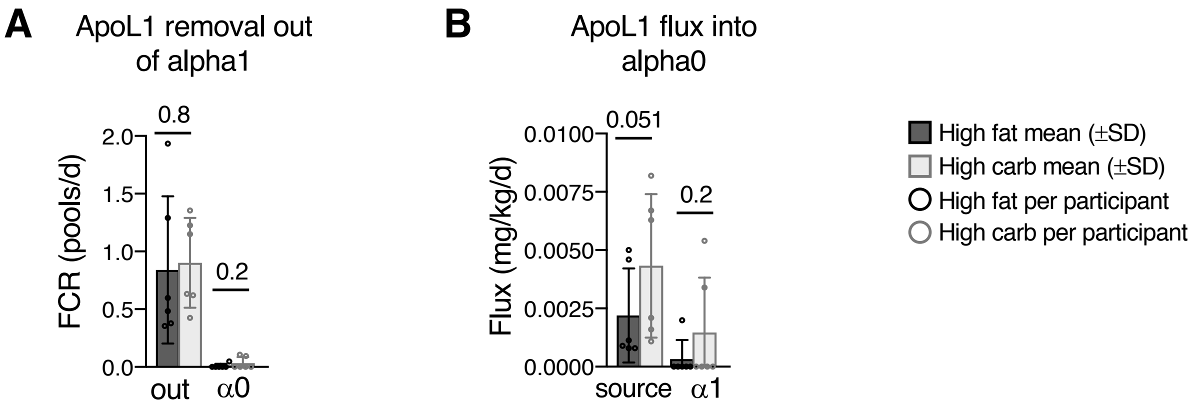
**Supplemental Figure II. Plasma protein concentrations on the high fat and high carbohydrate diets.** Fasting plasma protein concentrations after 4 weeks on the high fat (HF) and high carbohydrate (HC) diets (n=11, participants #1, 3-12). Values on each diet were compared by two-tailed, paired *t*-test. Significant differences between diets are highlighted (*, $P < 0.05$), and non-significant *P*-values are shown.



**Supplemental Figure III. ApoA1 metabolic pathways out of and into each HDL size.**
(**A**) Rate of ApoA1 removal out of alpha3 and prebeta HDL by each removal pathway (pools/day). (**B**) Flux of ApoA1 into alpha0, alpha1, alpha2, and prebeta HDL by each flux pathway (mg/kg/day). (**A-B**) Mean (±SD) values from participants #1-6 on both diets are shown. Values between diets were compared by two-tailed, paired *t*-test, and *P*-values are shown above each size fraction. Out, removal pathway out of the HDL system; EVD, extravascular delay compartment (see ApoA1 model, **Figure 4B**).



**Supplemental Figure IV. ApoA2 and ApoE metabolic pathways out of and into each HDL size.** (**A**) Rate of ApoA2 removal out of alpha3 HDL by each removal pathway (pools/day). (**B**) Flux of ApoA2 into alpha2 HDL by each flux pathway (mg/kg/day). (**C**) Rate of ApoE removal out of alpha2 and alpha3 by each removal pathway. (**D**) Flux of ApoE into alpha0, alpha1, and alpha2 by each flux pathway. (**A-D**) Mean (SD) values from participants #1-6 on both diets are shown. Values between diets were compared by two-tailed, paired *t*-test. *P*-values are shown above each size fraction. *, $P < 0.05$; out, removal pathway out of the modeled HDL system.



**Supplemental Figure V. ApoL1 metabolic pathways out of and into each HDL size.** (**A**) Rate of ApoL1 removal out of alpha1 HDL by each removal pathways (pools/day). (**B**) Flux of ApoL1 into alpha0 HDL by each flux pathway (mg/kg/day). (**A-B**) Mean (SD) values from participants #1-6 on both diets are shown. Values between diets were compared by two-tailed, paired *t*-test, and *P*-values are shown above each size fraction. Out, removal pathway out of the modeled HDL system.

| Participant ID# | Gender | Race | Age | Height (m) | Weight (kg) | BMI (kg/m$^2$) | Glucose (mg/dl) | TG (mg/dl) | Total-C (mg/dl) | LDL-C (mg/dl) | HDL-C (mg/dl) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1* | female | black | 33 | 1.70 | 85.8 | 29.6 | 86 | 50 | 142 | 95 | 37 |
| 2* | male | white | 39 | 1.85 | 110.3 | 32.1 | 92 | 138 | 176 | 103 | 45 |
| 3* | male | white | 49 | 1.73 | 94.2 | 31.5 | 78 | 262 | 158 | 82 | 24 |
| 4* | male | black | 48 | 1.75 | 91.7 | 29.8 | 84 | 64 | 171 | 116 | 42 |
| 5* | female | white | 25 | 1.69 | 75.6 | 26.5 | 84 | 54 | 132 | 73 | 48 |
| 6* | female | white | 40 | 1.68 | 86.1 | 30.6 | 91 | 139 | 219 | 147 | 44 |
| 7 | female | black | 25 | 1.58 | 87.2 | 35.1 | 92 | 62 | 145 | 85 | 48 |
| 8 | female | white | 23 | 1.58 | 68.8 | 27.7 | 84 | 87 | 123 | 59 | 47 |
| 9 | female | white | 70 | 1.65 | 85.5 | 31.3 | 99 | 72 | 193 | 125 | 54 |
| 10 | female | white | 62 | 1.60 | 90.5 | 35.3 | 96 | 76 | 175 | 105 | 55 |
| 11 | female | white | 33 | 1.61 | 80.8 | 31.0 | 80 | 88 | 193 | 122 | 53 |
| 12 | male | white | 59 | 1.83 | 92.8 | 27.7 | 86 | 59 | 144 | 96 | 36 |
| Mean<br>(SD) | 8 female<br>4 male | 9 white<br>3 black | 42<br>(16) | 1.69<br>(0.09) | 87.4<br>(10.3) | 30.7<br>(2.7) | 87.7<br>(6.4) | 95.9<br>(60.1) | 164<br>(29) | 101<br>(25) | 44.4<br>(8.8) |

**Supplemental Table I. Clinical data at baseline.** BMI, body mass index; TG, triglyceride; total-C, total cholesterol; LDL-C, LDL cholesterol; HDL-C, HDL cholesterol; *, participants included in the HDL protein metabolism analysis.

| Protein | Peptide Sequence | M0 *m/z* | M3 *m/z* | Isolation *m/z* | *z* | Ion type | RT (min) |
|---|---|---|---|---|---|---|---|
| ApoA1 | ATEHLSTLSEK | 405.8787 | 407.8913 | 406.8850 | 3 | precursor | 10-14 |
| | LSEK | 476.2715 | 479.2903 | | 1 | y4 | |
| | TLSEK | 577.3192 | 580.3380 | | 1 | y5 | |
| | THLAPYSDELR | 434.5543 | 436.5669 | 435.5606 | 3 | precursor | 17.5-19.5 |
| | THL | 352.1979 | 355.2168 | | 1 | b3 | |
| | THLA | 423.2350 | 426.2539 | | 1 | b4 | |
| | THLAP | 520.2878 | 523.3066 | | 1 | b5 | |
| | ELR | 417.2456 | 420.2644 | | 1 | y3 | |
| | DELR | 532.2726 | 535.2914 | | 1 | y4 | |
| | VKDLATVYVDVLK | 488.2887 | 490.3013 | 489.2950 | 3 | precursor | 25-29 |
| | VLK | 359.2653 | 362.2841 | | 1 | y3 | |
| | DVLK | 474.2922 | 477.3111 | | 1 | y4 | |
| | VDVLK | 573.3606 | 576.3795 | | 1 | y5 | |
| ApoA2 | SKEQLTPLIK | 578.8504 | 581.8693 | 580.3599 | 2 | precursor | 16.5-18.5 |
| | PLIK | 470.3337 | 473.3525 | | 1 | y4 | |
| | TPLIK | 571.3814 | 574.4002 | | 1 | y5 | |
| ApoC3 | DALSSVQESQVAQQAR | 858.9292 | 860.4386 | 859.6839 | 2 | precursor | 20.5-22.5 |
| | DAL | 300.1554 | 303.1742 | | 1 | b3 | |
| | DALS | 387.1874 | 390.2063 | | 1 | b4 | |
| | DALSS | 474.2195 | 477.2383 | | 1 | b5 | |
| ApoE | LGPLVEQGR | 484.7798 | 487.7986 | 486.2892 | 2 | precursor | 17-19 |
| | LGP | 268.1656 | 271.1844 | | 1 | b3 | |
| | LGPL | 381.2496 | 384.2685 | | 1 | b4 | |
| | LGPLV | 480.3180 | 483.3369 | | 1 | b5 | |
| ApoJ | ELDESLQVAER | 644.8226 | 647.8414 | 646.3320 | 2 | precursor | 20-22 |
| | EL | 243.1339 | 246.1527 | | 1 | b2 | |
| | ELD | 358.1609 | 361.1797 | | 1 | b3 | |
| | ELDE | 487.2035 | 490.2223 | | 1 | b4 | |
| ApoL1 | ALDNLAR | 386.7192 | 389.7381 | 388.2287 | 2 | precursor | 14.5-17 |
| | NLAR | 473.2831 | 476.3019 | | 1 | y4 | |
| | DNLAR | 588.3100 | 591.3288 | | 1 | y5 | |
| ApoM | FLLYNR | 413.2345 | 416.2533 | 414.7439 | 2 | precursor | 21-23 |
| | FL | 261.1598 | 264.1786 | | 1 | b2 | |
| | LYNR | 565.3093 | 568.3281 | | 1 | y4 | |
| | LLYNR | 678.3933 | 681.4122 | | 1 | y5 | |
| LCAT | SSGLVSNAPGVQIR | 692.8808 | 694.3992 | 693.6400 | 2 | precursor | 20-22 |
| | SSGL | 317.1819 | 320.2007 | | 1 | a4 | |
| | SSGLV | 416.2504 | 419.2692 | | 1 | a5 | |
| | SSGL | 345.1769 | 348.1957 | | 1 | b4 | |
| | SSGLV | 444.2453 | 447.2641 | | 1 | b5 | |

**Supplemental Table II. Peptides and their corresponding fragment ions used to quantify enrichment by parallel reaction monitoring (PRM).** *m/z*, mass-to-charge of the M0 (D0-Leu) and M3 (D3-Leu) fragment ions, and the average mass used for PRM isolation (10 Da isolation window). Typical retention time (RT) range used for a 30 minute reverse phase gradient, one representative participant (#6, high fat) is shown. Fragment ions with multiple leucines were measured as singly labeled since the probability of observing multiple D3-leucines is lower.

| Protein | Fraction | High Fat Mean (SD) | High Carb Mean (SD) | *t*-test *P*-value | Protein | High Fat Mean (SD) | High Carb Mean (SD) | *t*-test *P*-value |
|---|---|---|---|---|---|---|---|---|
| ApoA1 | α0 | 31 (10) | 26 (15) | 0.64 | ApoJ | 86 (44) | 122 (58) | 0.0070 |
| | α1 | 582 (246) | 366 (301) | 0.029 | | 46 (10) | 41 (20) | 0.55 |
| | α2 | 2100 (732) | 1969 (776) | 0.74 | | 31 (15) | 27 (11) | 0.69 |
| | α3 | 2085 (890) | 2227 (426) | 0.73 | | 26 (10) | 23 (5.6) | 0.38 |
| | preβ | 87 (59) | 54 (28) | 0.27 | | 3.6 (2.8) | 1.7 (1.7) | 0.27 |
| | total HDL | 4885 (1093) | 4642 (969) | 0.39 | | 192 (46) | 214 (85) | 0.29 |
| ApoA2 | α0 | 3.5 (2.7) | 4.0 (2.2) | 0.78 | ApoL1 | 0.49 (0.48) | 0.54 (0.27) | 0.75 |
| | α1 | 57 (34) | 95 (67) | 0.37 | | 4.2 (1.4) | 4.8 (1.9) | 0.089 |
| | α2 | 465 (152) | 647 (245) | 0.22 | | 0.86 (0.28) | 0.71 (0.19) | 0.11 |
| | α3 | 486 (373) | 387 (180) | 0.45 | | 0.14 (0.11) | 0.17 (0.10) | 0.52 |
| | preβ | 1.2 (1.1) | 1.5 (1.3) | 0.72 | | 0.0006 (0.0007) | 0.0005 (0.0004) | 0.67 |
| | total HDL | 1013 (366) | 1134 (370) | 0.012 | | 5.7 (1.6) | 6.3 (2.2) | 0.21 |
| ApoC3 | α0 | 13 (13) | 12 (5) | 0.93 | ApoM | 2.8 (2.0) | 2.1 (1.0) | 0.24 |
| | α1 | 31 (23) | 36 (25) | 0.79 | | 34 (40) | 19 (15) | 0.20 |
| | α2 | 68 (60) | 99 (64) | 0.45 | | 47 (70) | 26 (26) | 0.37 |
| | α3 | 174 (88) | 202 (84) | 0.19 | | 1.1 (0.9) | 1.0 (0.8) | 0.058 |
| | preβ | 48 (51) | 71 (116) | 0.52 | | 0.031 (0.043) | 0.018 (0.008) | 0.43 |
| | total HDL | 333 (111) | 419 (100) | 0.056 | | 85 (110) | 48 (38) | 0.29 |
| ApoE | α0 | 24 (16) | 34 (14) | 0.079 | LCAT | 0.64 (0.35) | 0.53 (0.32) | 0.59 |
| | α1 | 71 (20) | 82 (24) | 0.48 | | 0.73 (0.28) | 0.60 (0.28) | 0.39 |
| | α2 | 112 (46) | 131 (32) | 0.37 | | 1.7 (0.6) | 1.3 (0.4) | 0.46 |
| | α3 | 72 (65) | 71 (47) | 0.97 | | 8.9 (3.6) | 7.3 (1.9) | 0.45 |
| | preβ | 1.7 (1.1) | 1.7 (1.0) | 0.92 | | 1.4 (1.6) | 0.78 (0.38) | 0.33 |
| | total HDL | 280 (89) | 320 (81) | 0.14 | | 13 (4.8) | 11 (3) | 0.35 |

**Supplemental Table III. Pool sizes for 8 HDL proteins across 5 HDL sizes.** Protein pool size (mg of protein in a given plasma pool) was measured in participants #1-6 on both diets. Mean (SD) for each protein across the size fractions and on total HDL (sum of 5 HDL sizes) are shown. Values between diets were compared by two-tailed, paired *t*-test.

|  |  |  | *FCR (pools/day)* |  | *Production rate (mg/kg/day)* |  | *Pool size (mg)* |  |
|---|---|---|---|---|---|---|---|---|
| *Protein* | *HDL Size* | *Participant #* | High Fat | High Carb | High Fat | High Carb | High Fat | High Carb |
| **ApoA1** | α0 | 1 | 1.86 | 2.93 | 0.88 | 0.40 | 42.43 | 11.96 |
|  |  | 2 | 6.90 | 11.42 | 2.48 | 3.09 | 39.48 | 29.15 |
|  |  | 3 | 0.36 | 3.23 | 0.11 | 0.17 | 28.50 | 4.61 |
|  |  | 4 | 7.07 | 15.69 | 2.73 | 6.55 | 33.97 | 37.35 |
|  |  | 5 | 0.13 | 0.17 | 0.03 | 0.09 | 14.42 | 37.50 |
|  |  | 6 | 4.07 | 5.32 | 1.25 | 2.38 | 25.71 | 37.52 |
|  |  | mean | 3.40 | 6.46 | 1.25 | 2.11 | 30.75 | 26.35 |
|  |  | (SD) | 3.11 | 5.89 | 1.15 | 2.51 | 10.20 | 14.54 |
|  |  | *P*-value | 0.063 |  | 0.23 |  | 0.63 |  |
|  | α1 | 1 | 0.89 | 1.90 | 6.16 | 4.93 | 618.62 | 225.60 |
|  |  | 2 | 1.35 | 6.40 | 6.58 | 16.07 | 534.35 | 270.46 |
|  |  | 3 | 0.73 | 2.86 | 3.55 | 2.09 | 442.37 | 65.73 |
|  |  | 4 | 0.69 | 1.89 | 2.10 | 6.55 | 267.08 | 310.28 |
|  |  | 5 | 0.17 | 0.48 | 2.32 | 6.28 | 1003.97 | 941.73 |
|  |  | 6 | 0.85 | 0.90 | 6.37 | 4.07 | 625.18 | 380.75 |
|  |  | mean | 0.78 | 2.41 | 4.51 | 6.66 | 581.93 | 365.76 |
|  |  | (SD) | 0.38 | 2.13 | 2.10 | 4.89 | 245.85 | 301.26 |
|  |  | *P*-value | 0.082 |  | 0.31 |  | 0.029 |  |
|  | α2 | 1 | 0.85 | 1.69 | 17.41 | 22.08 | 1821.00 | 1137.22 |
|  |  | 2 | 0.50 | 0.51 | 12.40 | 9.92 | 2712.38 | 2111.04 |
|  |  | 3 | 0.51 | 1.79 | 9.27 | 18.76 | 1644.87 | 943.60 |
|  |  | 4 | 1.17 | 0.67 | 13.81 | 18.50 | 1036.71 | 2481.62 |
|  |  | 5 | 0.37 | 0.50 | 15.07 | 15.26 | 3000.81 | 2206.70 |
|  |  | 6 | 0.32 | 0.68 | 9.22 | 23.79 | 2381.48 | 2934.03 |
|  |  | mean | 0.62 | 0.97 | 12.86 | 18.05 | 2099.54 | 1969.03 |
|  |  | (SD) | 0.33 | 0.60 | 3.25 | 4.98 | 732.29 | 776.41 |
|  |  | *P*-value | 0.23 |  | 0.095 |  | 0.74 |  |
|  | α3 | 1 | 0.57 | 0.62 | 8.76 | 14.76 | 1378.54 | 2081.78 |
|  |  | 2 | 0.33 | 0.52 | 7.37 | 14.80 | 2426.46 | 3050.72 |
|  |  | 3 | 0.62 | 0.60 | 8.66 | 15.32 | 1274.47 | 2302.64 |
|  |  | 4 | 0.31 | 0.51 | 12.59 | 11.60 | 3610.98 | 2051.38 |
|  |  | 5 | 0.19 | 0.47 | 5.85 | 12.72 | 2296.11 | 1956.53 |
|  |  | 6 | 0.23 | 0.38 | 4.20 | 8.77 | 1525.59 | 1913.03 |
|  |  | mean | 0.37 | 0.52 | 7.90 | 12.99 | 2085.36 | 2226.01 |
|  |  | (SD) | 0.18 | 0.09 | 2.88 | 2.52 | 889.80 | 426.12 |
|  |  | *P*-value | 0.024 |  | 0.011 |  | 0.73 |  |
|  | preβ | 1 | 4.91 | 13.59 | 10.61 | 4.58 | 192.23 | 29.37 |
|  |  | 2 | 7.28 | 22.87 | 7.23 | 18.21 | 109.13 | 85.83 |
|  |  | 3 | 3.59 | 20.34 | 1.21 | 6.28 | 30.83 | 27.81 |
|  |  | 4 | 24.93 | 16.90 | 14.89 | 12.91 | 52.46 | 68.36 |
|  |  | 5 | 9.21 | 16.00 | 6.26 | 6.23 | 49.74 | 28.29 |
|  |  | 6 | 4.52 | 9.75 | 4.74 | 9.59 | 87.73 | 82.55 |
|  |  | mean | 9.07 | 16.57 | 7.49 | 9.63 | 87.02 | 53.70 |
|  |  | (SD) | 8.04 | 4.68 | 4.76 | 5.15 | 58.82 | 28.24 |
|  |  | *P*-value | 0.095 |  | 0.43 |  | 0.27 |  |
|  | system | 1 | 0.74 | 0.68 | 33.50 | 27.41 | 4052.83 | 3485.92 |
|  |  | 2 | 0.41 | 0.58 | 21.46 | 30.06 | 5821.80 | 5547.20 |
|  |  | 3 | 0.56 | 0.70 | 21.14 | 25.95 | 3421.04 | 3344.39 |
|  |  | 4 | 0.33 | 0.57 | 18.65 | 31.59 | 5001.20 | 4948.99 |
|  |  | 5 | 0.21 | 0.48 | 18.17 | 34.07 | 6365.05 | 5170.75 |
|  |  | 6 | 0.30 | 0.47 | 16.83 | 30.23 | 4645.69 | 5347.87 |
|  |  | mean | 0.42 | 0.58 | 21.63 | 29.89 | 4884.60 | 4640.85 |
|  |  | (SD) | 0.19 | 0.10 | 6.08 | 2.90 | 1093.12 | 970.75 |
|  |  | *P*-value | 0.019 |  | 0.054 |  | 0.39 |  |

**Supplemental Table IV. Kinetic parameters of 8 HDL proteins across 5 HDL sizes (page 1/4).**

|  |  |  | *FCR (pools/day)* |  | *Production rate (mg/kg/day)* |  | *Pool size (mg)* |  |
|---|---|---|---|---|---|---|---|---|
| *Protein* | *HDL Size* | *Participant #* | High Fat | High Carb | High Fat | High Carb | High Fat | High Carb |
| **ApoA2** | α1 | 1 | 0.51 | 0.51 | 0.58 | 0.41 | 99.91 | 70.00 |
|  |  | 2 | 0.24 | 0.54 | 0.04 | 1.03 | 18.58 | 205.92 |
|  |  | 3 | 0.55 | 0.58 | 0.38 | 0.33 | 64.21 | 51.59 |
|  |  | 4 | 0.37 | 0.41 | 0.30 | 0.30 | 71.18 | 65.14 |
|  |  | 5 | 0.33 | 0.52 | 0.06 | 1.04 | 13.13 | 147.33 |
|  |  | 6 | 0.49 | 0.90 | 0.43 | 0.35 | 72.73 | 32.50 |
|  |  | mean | 0.41 | 0.58 | 0.30 | 0.58 | 56.62 | 95.41 |
|  |  | (SD) | 0.12 | 0.17 | 0.21 | 0.36 | 33.89 | 66.86 |
|  |  | *P*-value | 0.062 |  | 0.27 |  | 0.37 |  |
|  | α2 | 1 | 0.74 | 1.24 | 3.40 | 5.83 | 408.32 | 410.26 |
|  |  | 2 | 0.31 | 1.09 | 2.10 | 6.63 | 736.25 | 653.93 |
|  |  | 3 | 0.66 | 0.54 | 2.99 | 2.78 | 411.78 | 464.61 |
|  |  | 4 | 0.38 | 0.52 | 1.34 | 6.44 | 306.53 | 1099.48 |
|  |  | 5 | 0.40 | 0.54 | 2.92 | 5.02 | 538.39 | 675.77 |
|  |  | 6 | 0.80 | 1.04 | 3.76 | 7.13 | 390.06 | 575.56 |
|  |  | mean | 0.55 | 0.83 | 2.75 | 5.64 | 465.22 | 646.60 |
|  |  | (SD) | 0.21 | 0.33 | 0.89 | 1.58 | 152.14 | 244.96 |
|  |  | *P*-value | 0.083 |  | 0.014 |  | 0.22 |  |
|  | α3 | 1 | 0.54 | 0.64 | 1.46 | 2.37 | 241.56 | 322.57 |
|  |  | 2 | 0.22 | 0.50 | 1.30 | 3.21 | 647.01 | 689.67 |
|  |  | 3 | 0.61 | 0.64 | 2.23 | 2.63 | 331.31 | 368.09 |
|  |  | 4 | 0.33 | 0.50 | 4.36 | 2.64 | 1173.37 | 475.96 |
|  |  | 5 | 0.36 | 0.41 | 0.88 | 0.92 | 177.25 | 162.12 |
|  |  | 6 | 0.45 | 0.68 | 1.88 | 2.44 | 345.94 | 302.04 |
|  |  | mean | 0.42 | 0.56 | 2.02 | 2.37 | 486.07 | 386.74 |
|  |  | (SD) | 0.14 | 0.11 | 1.24 | 0.77 | 373.37 | 179.90 |
|  |  | *P*-value | 0.016 |  | 0.51 |  | 0.45 |  |
|  | system | 1 | 0.64 | 0.68 | 5.43 | 6.24 | 749.79 | 802.83 |
|  |  | 2 | 0.27 | 0.53 | 3.45 | 7.66 | 1401.84 | 1549.52 |
|  |  | 3 | 0.63 | 0.58 | 5.61 | 5.75 | 807.29 | 884.29 |
|  |  | 4 | 0.34 | 0.44 | 6.00 | 8.01 | 1551.07 | 1640.58 |
|  |  | 5 | 0.39 | 0.45 | 3.85 | 6.07 | 728.77 | 985.22 |
|  |  | 6 | 0.43 | 0.69 | 4.19 | 7.48 | 808.73 | 910.09 |
|  |  | mean | 0.45 | 0.56 | 4.75 | 6.87 | 1007.91 | 1128.75 |
|  |  | (SD) | 0.15 | 0.11 | 1.06 | 0.96 | 367.33 | 366.99 |
|  |  | *P*-value | 0.083 |  | 0.019 |  | 0.010 |  |
| **ApoC3** | α3 | 1 | 4.21 | 3.79 | 4.17 | 6.03 | 87.98 | 138.58 |
|  |  | 2 | 1.06 | 1.77 | 1.39 | 2.58 | 144.49 | 157.71 |
|  |  | 3 | 1.16 | 0.98 | 3.72 | 3.80 | 290.86 | 350.04 |
|  |  | 4 | 0.23 | 0.88 | 0.70 | 2.15 | 272.00 | 218.43 |
|  |  | 5 | 2.21 | 2.50 | 2.69 | 4.12 | 89.10 | 119.73 |
|  |  | 6 | 2.85 | 3.37 | 5.46 | 9.02 | 160.05 | 224.67 |
|  |  | mean | 1.95 | 2.21 | 3.02 | 4.62 | 174.08 | 201.53 |
|  |  | (SD) | 1.44 | 1.22 | 1.79 | 2.55 | 88.24 | 84.20 |
|  |  | *P*-value | 0.23 |  | 0.018 |  | 0.19 |  |
| **ApoE** | α0 | 1 | 22.50 | 6.36 | 8.17 | 2.25 | 32.31 | 30.77 |
|  |  | 2 | 3.82 | 4.43 | 0.67 | 1.05 | 19.35 | 25.44 |
|  |  | 3 | 6.75 | 4.09 | 3.43 | 2.02 | 46.15 | 44.33 |
|  |  | 4 | 15.54 | 39.96 | 5.84 | 25.83 | 33.00 | 57.85 |
|  |  | 5 | 4.05 | 5.68 | 0.37 | 1.81 | 6.63 | 23.15 |
|  |  | 6 | 16.74 | 5.54 | 1.72 | 1.41 | 8.56 | 21.30 |
|  |  | mean | 11.57 | 11.01 | 3.36 | 5.73 | 24.33 | 33.81 |
|  |  | (SD) | 7.77 | 14.21 | 3.10 | 9.86 | 15.50 | 14.41 |
|  |  | *P*-value | 0.93 |  | 0.55 |  | 0.079 |  |

**Supplemental Table IV. Kinetic parameters of 8 HDL proteins across 5 HDL sizes (page 2/4).**

|  |  |  | *FCR (pools/day)* |  | *Production rate (mg/kg/day)* |  | *Pool size (mg)* |  |
|---|---|---|---|---|---|---|---|---|
| *Protein* | *HDL Size* | *Participant #* | High Fat | High Carb | High Fat | High Carb | High Fat | High Carb |
|  | α1 | 1 | 4.79 | 4.66 | 4.76 | 3.45 | 88.50 | 64.52 |
|  |  | 2 | 3.29 | 7.23 | 2.32 | 5.59 | 77.53 | 83.33 |
|  |  | 3 | 1.89 | 4.20 | 1.99 | 3.09 | 95.65 | 66.17 |
|  |  | 4 | 3.36 | 5.50 | 1.89 | 6.79 | 49.25 | 110.43 |
|  |  | 5 | 2.23 | 3.35 | 1.98 | 5.13 | 65.12 | 111.34 |
|  |  | 6 | 6.00 | 6.50 | 3.53 | 4.49 | 49.17 | 58.00 |
|  |  | mean | 3.59 | 5.24 | 2.74 | 4.76 | 70.87 | 82.30 |
|  |  | (SD) | 1.56 | 1.46 | 1.16 | 1.38 | 19.70 | 23.67 |
|  |  | *P*-value | 0.040 |  | 0.075 |  | 0.48 |  |
|  | α2 | 1 | 7.51 | 20.38 | 8.07 | 22.60 | 95.73 | 96.56 |
|  |  | 2 | 6.70 | 6.84 | 11.12 | 7.94 | 182.30 | 125.18 |
|  |  | 3 | 1.89 | 7.21 | 2.22 | 12.01 | 106.86 | 149.86 |
|  |  | 4 | 6.43 | 6.16 | 5.94 | 11.51 | 81.09 | 167.22 |
|  |  | 5 | 12.36 | 9.33 | 9.60 | 11.77 | 56.81 | 91.64 |
|  |  | 6 | 5.87 | 8.36 | 10.38 | 15.47 | 147.65 | 155.42 |
|  |  | mean | 6.79 | 9.71 | 7.89 | 13.55 | 111.74 | 130.98 |
|  |  | (SD) | 3.36 | 5.35 | 3.33 | 5.03 | 45.84 | 31.73 |
|  |  | *P*-value | 0.26 |  | 0.072 |  | 0.37 |  |
|  | α3 | 1 | 11.12 | 14.01 | 4.97 | 8.00 | 39.78 | 49.75 |
|  |  | 2 | 8.56 | 9.95 | 10.17 | 13.81 | 130.59 | 149.61 |
|  |  | 3 | 7.04 | 7.84 | 2.98 | 4.37 | 38.51 | 50.13 |
|  |  | 4 | 3.97 | 10.09 | 7.91 | 12.29 | 175.15 | 108.98 |
|  |  | 5 | 10.33 | 10.93 | 4.79 | 4.74 | 33.93 | 31.51 |
|  |  | 6 | 8.36 | 10.82 | 1.16 | 4.68 | 11.58 | 36.32 |
|  |  | mean | 8.23 | 10.61 | 5.33 | 7.98 | 71.59 | 71.05 |
|  |  | (SD) | 2.55 | 2.00 | 3.27 | 4.17 | 65.32 | 47.48 |
|  |  | *P*-value | 0.036 |  | 0.011 |  | 0.97 |  |
|  | system | 1 | 7.23 | 10.20 | 20.82 | 28.30 | 256.31 | 241.59 |
|  |  | 2 | 6.51 | 6.65 | 24.27 | 23.68 | 409.77 | 383.56 |
|  |  | 3 | 2.81 | 5.40 | 8.88 | 18.62 | 287.17 | 310.50 |
|  |  | 4 | 4.54 | 6.57 | 17.49 | 32.62 | 338.49 | 444.48 |
|  |  | 5 | 5.38 | 6.61 | 11.95 | 23.45 | 162.49 | 257.64 |
|  |  | 6 | 6.02 | 8.07 | 15.63 | 26.05 | 216.96 | 271.05 |
|  |  | mean | 5.41 | 7.25 | 16.51 | 25.45 | 278.53 | 318.14 |
|  |  | (SD) | 1.57 | 1.68 | 5.65 | 4.77 | 87.91 | 80.05 |
|  |  | *P*-value | 0.0069 |  | 0.0091 |  | 0.14 |  |
| **ApoJ** | α0 | 1 | 2.03 | 1.96 | 1.63 | 2.34 | 71.36 | 104.02 |
|  |  | 2 | 1.75 | 1.83 | 1.30 | 1.87 | 81.61 | 110.01 |
|  |  | 3 | 1.97 | 2.17 | 1.86 | 2.35 | 85.53 | 97.36 |
|  |  | 4 | 0.31 | 1.08 | 0.60 | 2.87 | 171.10 | 237.50 |
|  |  | 5 | 1.47 | 1.52 | 1.06 | 2.15 | 52.57 | 103.12 |
|  |  | 6 | 1.36 | 2.35 | 0.86 | 2.15 | 52.38 | 76.92 |
|  |  | mean | 1.48 | 1.82 | 1.22 | 2.29 | 85.76 | 121.49 |
|  |  | (SD) | 0.63 | 0.46 | 0.47 | 0.34 | 44.10 | 57.97 |
|  |  | *P*-value | 0.12 |  | 0.011 |  | 0.0070 |  |
| **ApoL1** | α0 | 1 | 1.04 | 1.27 | 0.0050 | 0.0067 | 0.43 | 0.46 |
|  |  | 2 | 0.19 | 0.49 | 0.0008 | 0.0021 | 0.49 | 0.47 |
|  |  | 3 | 0.47 | 2.25 | 0.0011 | 0.0045 | 0.22 | 0.18 |
|  |  | 4 | 0.28 | 0.79 | 0.0046 | 0.0082 | 1.44 | 0.93 |
|  |  | 5 | 0.35 | 0.60 | 0.0009 | 0.0063 | 0.18 | 0.76 |
|  |  | 6 | 1.38 | 1.39 | 0.0028 | 0.0070 | 0.17 | 0.42 |
|  |  | mean | 0.62 | 1.13 | 0.0025 | 0.0058 | 0.49 | 0.54 |
|  |  | (SD) | 0.48 | 0.66 | 0.0019 | 0.0022 | 0.49 | 0.27 |
|  |  | *P*-value | 0.11 |  | 0.0035 |  | 0.76 |  |

**Supplemental Table IV. Kinetic parameters of 8 HDL proteins across 5 HDL sizes (page 3/4).**

|  |  |  | *FCR (pools/day)* |  | *Production rate (mg/kg/day)* |  | *Pool size (mg)* |  |
|---|---|---|---|---|---|---|---|---|
| *Protein* | *HDL Size* | *Participant #* | High Fat | High Carb | High Fat | High Carb | High Fat | High Carb |
|  | α1 | 1 | 1.93 | 1.35 | 0.064 | 0.049 | 2.96 | 3.14 |
|  |  | 2 | 0.36 | 0.63 | 0.021 | 0.049 | 6.57 | 8.38 |
|  |  | 3 | 1.29 | 1.25 | 0.047 | 0.044 | 3.33 | 3.19 |
|  |  | 4 | 0.38 | 1.23 | 0.018 | 0.068 | 4.08 | 4.94 |
|  |  | 5 | 0.60 | 0.62 | 0.041 | 0.045 | 5.04 | 5.20 |
|  |  | 6 | 0.53 | 0.53 | 0.022 | 0.027 | 3.46 | 4.23 |
|  |  | mean | 0.85 | 0.94 | 0.036 | 0.047 | 4.24 | 4.85 |
|  |  | (SD) | 0.63 | 0.38 | 0.018 | 0.013 | 1.35 | 1.93 |
|  |  | *P*-value | 0.66 |  | 0.30 |  | 0.089 |  |
|  | system | 1 | 1.82 | 1.34 | 0.069 | 0.056 | 3.39 | 3.60 |
|  |  | 2 | 0.34 | 0.63 | 0.022 | 0.051 | 7.06 | 8.85 |
|  |  | 3 | 1.24 | 1.21 | 0.048 | 0.045 | 3.55 | 3.37 |
|  |  | 4 | 0.35 | 1.16 | 0.022 | 0.076 | 5.52 | 5.87 |
|  |  | 5 | 0.59 | 0.62 | 0.042 | 0.051 | 5.22 | 5.96 |
|  |  | 6 | 0.53 | 0.51 | 0.023 | 0.028 | 3.63 | 4.65 |
|  |  | mean | 0.81 | 0.91 | 0.04 | 0.05 | 4.73 | 5.38 |
|  |  | (SD) | 0.59 | 0.36 | 0.02 | 0.02 | 1.46 | 2.02 |
|  |  | *P*-value | 0.59 |  | 0.24 |  | 0.069 |  |
| **ApoM** | α1 | 1 | 0.54 | 0.98 | 0.10 | 0.12 | 15.73 | 10.49 |
|  |  | 2 | 0.36 | 0.50 | 0.36 | 0.21 | 110.12 | 45.50 |
|  |  | 3 | 0.46 | 0.58 | 0.06 | 0.08 | 12.42 | 12.81 |
|  |  | 4 | 0.18 | 0.36 | 0.02 | 0.03 | 9.20 | 8.40 |
|  |  | 5 | 0.43 | 0.33 | 0.29 | 0.10 | 48.57 | 23.35 |
|  |  | 6 | 0.34 | 0.55 | 0.03 | 0.06 | 7.64 | 8.46 |
|  |  | mean | 0.38 | 0.55 | 0.14 | 0.10 | 33.95 | 18.17 |
|  |  | (SD) | 0.13 | 0.23 | 0.15 | 0.06 | 40.29 | 14.50 |
|  |  | *P*-value | 0.071 |  | 0.34 |  | 0.20 |  |
|  | α2 | 1 | 0.39 | 0.68 | 0.06 | 0.04 | 14.06 | 5.51 |
|  |  | 2 | 0.36 | 0.50 | 0.62 | 0.31 | 187.22 | 66.17 |
|  |  | 3 | 0.51 | 0.58 | 0.24 | 0.33 | 42.73 | 51.63 |
|  |  | 4 | 0.16 | 0.45 | 0.02 | 0.07 | 10.02 | 13.96 |
|  |  | 5 | 0.29 | 0.23 | 0.06 | 0.02 | 16.20 | 6.17 |
|  |  | 6 | 0.30 | 0.72 | 0.04 | 0.14 | 10.44 | 15.95 |
|  |  | mean | 0.33 | 0.53 | 0.17 | 0.15 | 46.78 | 26.56 |
|  |  | (SD) | 0.12 | 0.18 | 0.23 | 0.14 | 69.88 | 25.80 |
|  |  | *P*-value | 0.045 |  | 0.73 |  | 0.37 |  |
|  | system | 1 | 0.47 | 0.88 | 0.157 | 0.161 | 29.79 | 16.00 |
|  |  | 2 | 0.36 | 0.50 | 0.985 | 0.517 | 297.35 | 111.67 |
|  |  | 3 | 0.50 | 0.58 | 0.303 | 0.412 | 55.15 | 64.43 |
|  |  | 4 | 0.17 | 0.41 | 0.036 | 0.103 | 19.23 | 22.36 |
|  |  | 5 | 0.39 | 0.31 | 0.349 | 0.124 | 64.77 | 29.52 |
|  |  | 6 | 0.32 | 0.66 | 0.068 | 0.192 | 18.09 | 24.41 |
|  |  | mean | 0.37 | 0.56 | 0.32 | 0.25 | 80.73 | 44.73 |
|  |  | (SD) | 0.12 | 0.20 | 0.35 | 0.17 | 107.83 | 36.99 |
|  |  | *P*-value | 0.055 |  | 0.53 |  | 0.29 |  |
| **LCAT** | α3 | 1 | 3.11 | 2.33 | 0.50 | 0.17 | 14.20 | 6.52 |
|  |  | 2 | 0.36 | 0.65 | 0.02 | 0.05 | 5.41 | 8.77 |
|  |  | 3 | 0.86 | - | 0.12 | - | 12.58 | - |
|  |  | 4 | 0.51 | 0.53 | 0.05 | 0.05 | 8.07 | 8.67 |
|  |  | 5 | 0.74 | 0.66 | 0.06 | 0.05 | 6.15 | 5.76 |
|  |  | 6 | 0.25 | 0.36 | 0.02 | 0.04 | 7.08 | 9.17 |
|  |  | mean | 0.97 | 0.91 | 0.13 | 0.07 | 8.92 | 7.78 |
|  |  | (SD) | 1.07 | 0.80 | 0.18 | 0.06 | 3.62 | 1.53 |
|  |  | *P*-value | 0.65 |  | 0.46 |  | 0.84 |  |

**Supplemental Table IV. Kinetic parameters of 8 HDL proteins across 5 HDL sizes (page 4/4).** Values were compared between diets by two-tailed, paired *t*-test. FCR, fractional catabolic rate.

|  |  |  |  | Participant in which each protein was identified |  |  |  |  |  |  |  |  |  |  |  |  |  |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Gene Name | UniProt Entry # | Protein Name | # of Datasets | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | Set # | Group # & HDL size |
| CFH | P08603 | Complement factor H | 24 | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | 1 | I - α0 |
| A2M | P01023 | Alpha-2-macroglobulin | 24 | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | 1 | I - α0 |
| IGHM | P01871-2 | Isoform 2 of Ig mu chain C region | 24 | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | 1 | I - α0 |
| FN1 | P02751 | Fibronectin | 24 | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | 1 | I - α0 |
| APOB | P04114 | Apolipoprotein B-100 | 24 | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | 1 | I - α0 |
| C1QC | P02747 | Complement C1q subcomponent subunit C | 24 | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | 1 | I - α0 |
| LGALS3BP | Q08380 | Galectin-3-binding protein | 24 | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | 1 | I - α0 |
| CLU / APOJ | P10909-2 | Clusterin | 24 | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | 1 | I - α0 |
| FGB | P02675 | Fibrinogen beta chain | 24 | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | 1 | I - α0 |
| FGG | C9JC84 | Fibrinogen gamma chain | 24 | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | 1 | I - α0 |
| IGLC2 | P0CG05 | Ig lambda-2 chain C regions | 24 | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | 1 | I - α0 |
| FGA | P02671 | Fibrinogen alpha chain | 24 | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | 1 | I - α0 |
| HP | P00738 | Haptoglobin | 24 | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | 1 | I - α0 |
| HBB | P68871 | Hemoglobin subunit beta | 24 | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | 1 | I - α0 |
| C1R | P00736 | Complement C1r subcomponent | 24 | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | 1 | II - α1,2 |
| APOL1 | O14791-2 | Apolipoprotein L1 | 24 | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | 1 | II - α1,2 |
| PLTP | B3KUE5 | Phospholipid transfer protein | 24 | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | 1 | II - α1,2 |
| APOM | O95445 | Apolipoprotein M | 24 | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | 1 | II - α1,2 |
| APOE | P02649 | Apolipoprotein E | 24 | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | 1 | II - α1,2 |
| GPLD1 | P80108 | Phosphatidylinositol-glycan-specific phospholipase D | 24 | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | 1 | II - α1,2 |
| ITIH2 | P19823 | Inter-alpha-trypsin inhibitor heavy chain H2 | 24 | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | 1 | II - α1,2 |
| CETP | P11597 | Cholesteryl ester transfer protein | 24 | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | 1 | II - α1,2 |
| SAA4 | P35542 | Serum amyloid A-4 protein | 24 | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | 1 | II - α1,2 |
| C3 | P01024 | Complement C3 | 24 | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | 1 | II - α1,2 |
| APOA2 | V9GYM3 | Apolipoprotein A-II | 24 | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | 1 | II - α1,2 |
| APCS | P02743 | Serum amyloid P | 24 | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | 1 | II - α1,2 |
| CFI | E7ETH0 | Complement factor I light chain | 24 | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | 1 | II - α1,2 |
| TF | P02787 | Serotransferrin | 24 | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | 1 | III - α2,3,pβ |
| PROS1 | P07225 | Vitamin K-dependent protein S | 24 | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | 1 | III - α2,3,pβ |
| ITIH4 | Q14624 | Inter-alpha-trypsin inhibitor heavy chain H4 | 24 | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | 1 | III - α2,3,pβ |
| AGT | P01019 | Angiotensinogen | 24 | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | 1 | III - α2,3,pβ |
| APOA1 | P02647 | Apolipoprotein A-I | 24 | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | 1 | III - α2,3,pβ |
| APOC4-APOC2 | K7ER74 | Protein APOC4-APOC2 | 24 | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | 1 | III - α2,3,pβ |
| C4B | P0C0L5 | Complement C4-B | 24 | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | 1 | III - α2,3,pβ |
| VTN | P04004 | Vitronectin | 24 | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | 1 | III - α2,3,pβ |
| SERPINA3 | P01011 | Alpha-1-antichymotrypsin | 24 | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | 1 | III - α2,3,pβ |
| APOD | C9JF17 | Apolipoprotein D | 24 | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | 1 | III - α2,3,pβ |
| PON1 | F5H4W9;<br>P27169 | Serum paraoxonase/arylesterase 1 | 24 | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | 1 | III - α2,3,pβ |
| APOC3 | B0YIW2 | Apolipoprotein C-III | 24 | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | 1 | III - α2,3,pβ |
| CNDP1 | Q96KN2 | Beta-Ala-His dipeptidase | 24 | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | 1 | III - α2,3,pβ |
| LCAT | P04180 | Phosphatidylcholine-sterol acyltransferase | 24 | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | 1 | IV - α3 |
| CDH5 | P33151 | Cadherin-5 | 24 | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | 1 | IV - α3 |
| A1BG | P04217 | Alpha-1B-glycoprotein | 24 | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | 1 | IV - α3 |
| KNG1 | P01042-2;<br>P01042 | Kininogen-1 | 24 | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | 1 | IV - α3 |
| HPX | P02790 | Hemopexin | 24 | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | 1 | IV - α3 |
| SERPINC1 | P01008 | Antithrombin-III | 24 | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | 1 | IV - α3 |
| C1S | P09871 | Complement C1s subcomponent | 24 | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | 1 | IV - α3 |
| PLXDC2 | Q6UX71 | Plexin domain-containing protein 2 | 24 | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | 1 | IV - α3 |
| F5 | P12259 | Coagulation factor V | 24 | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | 1 | V - pβ |
| AHSG | C9JV77 | Alpha-2-HS-glycoprotein | 24 | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | 1 | V - pβ |
| SERPINA1 | P01009 | Alpha-1-antitrypsin | 24 | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | 1 | V - pβ |
| ALB | P02768 | Serum albumin | 24 | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | 1 | V - pβ |
| APOA4 | P06727 | Apolipoprotein A-IV | 24 | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | 1 | V – pβ |

**Supplemental Table V. HDL proteome distribution across HDL size (page 1/3).**

| Gene Name | UniProt Entry # | Protein Name | # of Datasets | Participant in which each protein was identified | | | | | | | | | | | | Set # | Group # & HDL size |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | | |
| IGJ | P01591 | Immunoglobulin J chain | 18 | ■ | □ | □ | □ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | 2 | I - α0 |
| FCGBP | Q9Y6R7 | IgGFc-binding protein | 20 | ■ | □ | ■ | ■ | ■ | □ | ■ | ■ | ■ | ■ | ■ | ■ | 2 | I - α0 |
| PLG | P00747 | Plasminogen | 22 | ■ | ■ | □ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | 2 | I - α0 |
| IGHG1 | P01857 | Ig gamma-1 chain C region | 22 | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | □ | ■ | 2 | I - α0 |
| C1QB | P02746 | Complement C1q subcomponent subunit B | 12 | ■ | □ | □ | ■ | □ | □ | ■ | □ | ■ | ■ | □ | ■ | 2 | I - α0 |
| IGHG2 | P01859 | Ig gamma-2 chain C region | 14 | ■ | □ | ■ | ■ | □ | ■ | ■ | □ | ■ | ■ | □ | □ | 2 | I - α0 |
| P01623 | P01623 | Ig kappa chain V-III region WOL | 12 | □ | ■ | □ | □ | ■ | ■ | □ | ■ | □ | ■ | ■ | □ | 2 | I - α0 |
| HBA1 | P69905 | Hemoglobin subunit alpha | 22 | ■ | ■ | ■ | ■ | ■ | ■ | □ | ■ | ■ | ■ | ■ | ■ | 2 | I - α0 |
| SERPIND1 | P05546 | Heparin cofactor 2 | 12 | ■ | ■ | □ | ■ | □ | □ | □ | ■ | ■ | □ | □ | ■ | 2 | II - α0,1 |
| C5 | P01031 | Complement C5 | 22 | ■ | ■ | □ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | 2 | II - α0,1 |
| IGHG4 | P01861 | Ig gamma-4 chain C region | 16 | ■ | ■ | ■ | ■ | □ | ■ | ■ | ■ | ■ | □ | □ | □ | 2 | II - α0,1 |
| IGKC | P01834 | Ig kappa chain C region | 18 | ■ | ■ | ■ | ■ | □ | ■ | ■ | □ | ■ | ■ | □ | ■ | 2 | II - α0,1 |
| LBP | P18428 | Lipopolysaccharide-binding protein | 12 | ■ | □ | ■ | ■ | □ | ■ | ■ | □ | ■ | □ | □ | □ | 2 | II - α0,1 |
| HPR | P00739-2 | Haptoglobin-related protein | 20 | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | □ | □ | ■ | 2 | II - α0,1 |
| P01781 | P01781 | Ig heavy chain V-III region GAL | 13 | ■ | □ | ■ | ■ | □ | □ | □ | ■ | □ | ■ | ■ | 🟦 | 2 | II - α0,1 |
| KLKB1 | H0YAC1 | Plasma kallikrein heavy chain (Fragment) | 15 | ■ | ■ | ■ | ■ | □ | 🟦 | ■ | 🟥 | □ | ■ | □ | 🟦 | 2 | II - α0,1 |
| C8G | P07360 | Complement component C8 gamma chain | 12 | ■ | □ | □ | ■ | □ | □ | ■ | □ | ■ | ■ | □ | ■ | 2 | II - α0,1 |
| C8A | P07357 | Complement component C8 alpha chain | 14 | ■ | □ | □ | ■ | □ | □ | ■ | □ | ■ | ■ | ■ | ■ | 2 | II - α0,1 |
| BPIFB1 | Q8TDL5 | BPI fold-containing family B member 1 | 18 | ■ | ■ | □ | ■ | ■ | □ | ■ | □ | ■ | ■ | ■ | ■ | 2 | II - α0,1 |
| APOC1 | P02654 | Apolipoprotein C-I | 18 | ■ | ■ | ■ | ■ | □ | ■ | ■ | ■ | ■ | □ | □ | ■ | 2 | III - α1,2,3 |
| SERPING1 | E9PGN7;<br>B4E1F0 | Plasma protease C1 inhibitor | 20 | ■ | ■ | □ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | □ | ■ | 2 | III - α1,2,3 |
| ITIH1 | P19827 | Inter-alpha-trypsin inhibitor heavy chain H1 | 15 | ■ | ■ | □ | ■ | □ | □ | ■ | ■ | ■ | ■ | □ | 🟦 | 2 | III - α1,2,3 |
| CFB | B4E1Z4 | Complement factor B | 20 | ■ | ■ | □ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | □ | ■ | 2 | III - α1,2,3 |
| SAA1 | E9PQD6;<br>P0DJI8 | Serum amyloid A protein | 14 | □ | ■ | □ | ■ | ■ | □ | ■ | □ | ■ | ■ | ■ | □ | 2 | III - α1,2,3 |
| FBLN1 | P23142;<br>B1AHL2 | Fibulin-1 | 18 | ■ | ■ | □ | □ | ■ | ■ | □ | ■ | ■ | ■ | ■ | ■ | 2 | III - α1,2,3 |
| PCYOX1 | Q9UHG3 | Prenylcysteine oxidase 1 | 20 | ■ | □ | ■ | ■ | □ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | 2 | III - α1,2,3 |
| CPN2 | P22792 | Carboxypeptidase N subunit 2 | 22 | ■ | ■ | □ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | 2 | III - α1,2,3 |
| ITIH3 | Q06033 | Inter-alpha-trypsin inhibitor heavy chain H3 | 12 | ■ | ■ | □ | □ | ■ | □ | □ | ■ | 🟦 | ■ | □ | 🟦 | 2 | IV - α3 |
| EFEMP1 | Q12805 | EGF-containing fibulin-like extracellular matrix protein 1 | 16 | ■ | □ | □ | □ | ■ | ■ | ■ | ■ | □ | ■ | ■ | ■ | 2 | IV - α3 |
| SERPINF2 | P08697 | Alpha-2-antiplasmin | 18 | ■ | ■ | ■ | ■ | ■ | ■ | □ | ■ | ■ | □ | □ | ■ | 2 | IV - α3 |
| HRG | P04196 | Histidine-rich glycoprotein | 22 | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | □ | ■ | 2 | IV - α3 |
| MASP1 | P48740-2 | Isoform 2 of Mannan-binding lectin serine protease 1 | 16 | □ | □ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | □ | □ | ■ | 2 | IV - α3 |
| CP | P00450 | Ceruloplasmin | 22 | ■ | ■ | ■ | □ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | 2 | IV - α3 |
| C9 | P02748 | Complement component C9 | 20 | ■ | ■ | ■ | □ | □ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | 2 | IV - α3 |
| TTR | P02766 | Transthyretin | 16 | ■ | □ | ■ | ■ | ■ | ■ | ■ | □ | ■ | □ | □ | ■ | 2 | V - α3, pβ |
| PON3 | Q15166 | Serum paraoxonase/lactonase 3 | 22 | ■ | ■ | ■ | ■ | ■ | ■ | ■ | □ | ■ | ■ | ■ | ■ | 2 | V - α3, pβ |
| GC | D6RF35;<br>P02774-3 | Vitamin D-binding protein | 22 | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | □ | ■ | 2 | V - α3, pβ |
| GPX3 | P22352 | Glutathione peroxidase 3 | 16 | ■ | □ | 🟦 | ■ | ■ | 🟦 | ■ | □ | ■ | □ | ■ | ■ | 2 | V - α3, pβ |
| HSPA5 | P11021 | 78 kDa glucose-regulated protein | 21 | ■ | □ | 🟦 | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | 2 | V - α3, pβ |
| PROZ | P22891-2 | Isoform 2 of Vitamin K-dependent protein Z | 14 | ■ | □ | □ | □ | ■ | ■ | ■ | ■ | □ | □ | ■ | ■ | 2 | V - α3, pβ |
| PROC | P04070-2 | Isoform 2 of Vitamin K-dependent protein C | 18 | ■ | □ | □ | □ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | 2 | V - α3, pβ |
| F9 | P00740 | Coagulation factor IX | 20 | ■ | □ | □ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | 2 | V - α3, pβ |
| FBLN5 | G3XA98 | Fibulin 5, isoform CRA_a | 18 | ■ | □ | ■ | ■ | ■ | ■ | ■ | □ | ■ | ■ | □ | ■ | 2 | V - α3, pβ |
| AZGP1 | P25311 | Zinc-alpha-2-glycoprotein | 13 | ■ | ■ | □ | ■ | □ | 🟦 | 🟦 | □ | ■ | ■ | □ | 🟦 | 2 | V - α3, pβ |

**Supplemental Table V. HDL proteome distribution across HDL size (page 2/3).**

| | | | | Participant in which each protein was identified | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Gene Name | UniProt Entry # | Protein Name | # of Datasets | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | Set # | Group # & HDL size |
| PZP | P20742 | Pregnancy zone protein | 8 | ■ | □ | □ | □ | □ | ■ | □ | ■ | □ | □ | □ | ■ | 3 | N/A |
| IGLL5 | B9A064 | Immunoglobulin lambda-like polypeptide 5 | 10 | ■ | ■ | □ | □ | □ | □ | ■ | ■ | □ | ■ | □ | □ | 3 | |
| ORM1 | P02763 | Alpha-1-acid glycoprotein 1 | 1 | □ | 🟦 | □ | □ | □ | □ | □ | □ | □ | □ | □ | □ | 3 | |
| LRG1 | P02750 | Leucine-rich alpha-2-glycoprotein | 2 | □ | ■ | □ | □ | □ | □ | □ | □ | □ | □ | □ | □ | 3 | |
| AMBP | P02760 | Protein AMBP | 6 | □ | ■ | ■ | ■ | □ | □ | □ | □ | □ | □ | □ | □ | 3 | |
| TPM4 | P67936 | Tropomyosin alpha-4 chain | 1 | □ | □ | 🟦 | □ | □ | □ | □ | □ | □ | □ | □ | □ | 3 | |
| MMP2 | P08253 | 72 kDa type IV collagenase | 1 | □ | □ | □ | □ | □ | □ | □ | □ | □ | □ | □ | 🟦 | 3 | |
| SERPINA11 | Q86U17 | Serpin A11 | 3 | ■ | □ | □ | □ | □ | □ | □ | □ | □ | □ | □ | 🟦 | 3 | |
| F11 | P03951 | Coagulation factor XI | 1 | 🟦 | □ | □ | □ | □ | □ | □ | □ | □ | □ | □ | □ | 3 | |
| C1QA | P02745 | Complement C1q subcomponent subunit A | 2 | ■ | □ | □ | □ | □ | □ | □ | □ | □ | □ | □ | □ | 3 | |
| PRG4 | Q92954 | Proteoglycan 4 | 2 | ■ | □ | □ | □ | □ | □ | □ | □ | □ | □ | □ | □ | 3 | |
| P01625 | P01625 | Ig kappa chain V-IV region Len | 4 | ■ | □ | □ | □ | □ | □ | □ | □ | □ | □ | □ | ■ | 3 | |
| ANTXR2 | P58335 | Anthrax toxin receptor 2 | 2 | ■ | □ | □ | □ | □ | □ | □ | □ | □ | □ | □ | □ | 3 | |
| ANTXR1 | Q9H6X2 | Anthrax toxin receptor 1 | 2 | ■ | □ | □ | □ | □ | □ | □ | □ | □ | □ | □ | □ | 3 | |
| ITGB1 | P05556-3 | Isoform 3 of Integrin beta-1 | 1 | 🟥 | □ | □ | □ | □ | □ | □ | □ | □ | □ | □ | □ | 3 | |
| APOF | Q13790 | Apolipoprotein F | 2 | ■ | □ | □ | □ | □ | □ | □ | □ | □ | □ | □ | □ | 3 | |
| SHBG | P04278 | Sex hormone-binding globulin | 2 | □ | □ | □ | □ | □ | □ | ■ | □ | □ | □ | □ | □ | 3 | |
| QSOX1 | O00391 | Sulfhydryl oxidase 1 | 2 | □ | □ | □ | □ | □ | □ | ■ | □ | □ | □ | □ | □ | 3 | |
| P80748 | P80748 | Ig lambda chain V-III region LOI | 2 | □ | □ | ■ | □ | □ | □ | □ | □ | □ | □ | □ | □ | 3 | |
| ACTB | P60709 | Actin, cytoplasmic 1 | 4 | □ | □ | ■ | □ | □ | □ | □ | □ | ■ | □ | □ | □ | 3 | |
| LPA | P08519 | Apolipoprotein(a) | 2 | □ | □ | □ | ■ | □ | □ | □ | □ | □ | □ | □ | □ | 3 | |
| P06316 | P06316 | Ig lambda chain V-I region BL2 | 4 | □ | □ | □ | ■ | □ | □ | □ | □ | □ | □ | ■ | □ | 3 | |
| ATRN | O75882 | Attractin | 2 | □ | □ | □ | ■ | □ | □ | □ | □ | □ | □ | □ | □ | 3 | |
| APOA5 | Q6Q788 | Apolipoprotein A-V | 2 | □ | □ | □ | ■ | □ | □ | □ | □ | □ | □ | □ | □ | 3 | |
| SERPINA4 | P29622 | Kallistatin | 8 | ■ | □ | □ | ■ | □ | □ | ■ | □ | □ | □ | □ | ■ | 3 | |
| CFHR4 | Q92496 | Complement factor H-related protein 4 | 4 | ■ | □ | □ | □ | □ | ■ | □ | □ | □ | □ | □ | □ | 3 | |
| HLA-A | P05534 | HLA class I histocompatibility antigen, A-24 alpha chain | 2 | □ | □ | □ | □ | □ | ■ | □ | □ | □ | □ | □ | □ | 3 | |
| IGHA1 | P01876 | Ig alpha-1 chain C region | 4 | □ | ■ | □ | □ | □ | ■ | □ | □ | □ | □ | □ | □ | 3 | |
| CFHR5 | Q5VYL6 | Complement factor H-related protein 5 | 2 | □ | ■ | □ | □ | □ | □ | □ | □ | □ | □ | □ | □ | 3 | |
| F7 | P08709 | Coagulation factor VII | 2 | 🟦 | □ | □ | □ | □ | □ | □ | □ | □ | □ | □ | 🟦 | 3 | |
| SERPINA6 | P08185 | Corticosteroid-binding globulin | 3 | ■ | □ | □ | 🟦 | □ | □ | □ | □ | □ | □ | □ | □ | 3 | |
| C4BPA | P04003 | C4b-binding protein alpha chain | 2 | □ | □ | □ | □ | ■ | □ | □ | □ | □ | □ | □ | □ | 3 | |
| CA6 | P23280 | Carbonic anhydrase 6 | 2 | □ | □ | □ | □ | □ | □ | ■ | □ | □ | □ | □ | □ | 3 | |
| C8B | P07358 | Complement component C8 beta chain | 4 | ■ | □ | □ | □ | □ | □ | ■ | □ | □ | □ | □ | □ | 3 | |
| P01593 | P01593 | Ig kappa chain V-I region AG | 6 | ■ | □ | □ | ■ | □ | ■ | □ | □ | □ | □ | □ | □ | 3 | |
| LTF | P02788 | Lactotransferrin | 4 | ■ | □ | □ | □ | □ | □ | □ | □ | ■ | □ | □ | □ | 3 | |
| TLN1 | Q9Y490 | Talin-1 | 8 | ■ | □ | ■ | ■ | □ | □ | □ | □ | ■ | □ | □ | □ | 3 | |
| ORM2 | P19652 | Alpha-1-acid glycoprotein 2 | 7 | ■ | □ | □ | ■ | □ | 🟦 | ■ | □ | □ | □ | □ | □ | 3 | |
| VWF | P04275 | von Willebrand factor | 4 | ■ | □ | □ | □ | □ | □ | □ | □ | ■ | □ | □ | □ | 3 | |
| F10 | P00742 | Coagulation factor X | 4 | 🟦 | □ | □ | □ | ■ | 🟦 | □ | □ | □ | □ | □ | □ | 3 | |
| GSN | P06396 | Gelsolin | 8 | ■ | □ | □ | ■ | □ | □ | □ | □ | ■ | □ | □ | ■ | 3 | |
| AFM | P43652 | Afamin | 4 | □ | ■ | □ | □ | □ | □ | □ | □ | ■ | □ | □ | □ | 3 | |
| F2 | P00734 | Prothrombin | 10 | ■ | ■ | □ | □ | □ | ■ | □ | □ | ■ | □ | □ | ■ | 3 | |
| IHH | Q14623 | Indian hedgehog protein | 8 | ■ | □ | ■ | ■ | □ | □ | □ | □ | ■ | □ | □ | □ | 3 | |
| APOC4 | P55056 | Apolipoprotein C-IV | 10 | ■ | ■ | ■ | □ | □ | ■ | □ | □ | ■ | □ | □ | □ | 3 | |
| F13B | P05160 | Coagulation factor XIII B chain | 10 | ■ | □ | □ | ■ | □ | □ | ■ | □ | ■ | □ | □ | ■ | 3 | |
| LUM | P51884 | Lumican | 10 | ■ | ■ | □ | ■ | ■ | □ | □ | □ | □ | □ | □ | ■ | 3 | |
| RBP4 | P02753 | Retinol-binding protein 4 | 11 | 🟦 | 🟥 | □ | ■ | 🟦 | 🟦 | ■ | □ | ■ | □ | □ | 🟦 | 3 | |

**Supplemental Table V. HDL proteome distribution across HDL size (page 3/3).** List of 145 proteins identified on HDL in one or more participants on the high fat and high carbohydrate diets. The order in which the proteins are listed, the Set #, and Group # correspond with **Figure 7B-D**. # of datasets, number of datasets in which each protein was identified. A total of of 24 proteome datasets were generated, one for each of the 12 participants on both diets. Dark gray boxes indicate proteins that were identified in a given participant on both diets; light grey boxes indicate proteins that were not identified in a given participant on either diet; blue boxes indicate proteins identified in a given participant only on the high fat diet; and red boxes indicate proteins identified in a given participant only on the high carbohydrate diet.

| Target antigen | Vendor or Source | Catalog # | Working concentration |
|---|---|---|---|
| goat anti-human polyclonal antibody against ApoA1 (coating) | Academy biomedical | 11A-G2b | 5 ug/mL |
| goat anti-human polyclonal antibody against ApoA1, biotin conjugate (detection) | Academy biomedical | 11B-G2b | 1 ug/mL |
| goat anti-human polyclonal antibody against ApoA2 (coating) | Academy biomedical | 12A-G1b | 5 ug/mL |
| goat anti-human polyclonal antibody against ApoA2, HRP conjugate (detection) | Academy biomedical | 12H-G2b | 1 ug/mL |
| goat anti-human polyclonal antibody against ApoC3 (coating) | Academy biomedical | 33A-G1b | 5 ug/mL |
| goat anti-human polyclonal antibody against ApoC3, HRP conjugate (detection) | Academy biomedical | 33H-G2b | 1 ug/mL |
| goat anti-human polyclonal antibody against ApoE (coating) | Academy biomedical | 50H-G1b | 10 ug/mL |
| goat anti-human polyclonal antibody against ApoE, HRP conjugate (detection) | Academy biomedical | 50S-G1b | 1 ug/mL |
| mouse anti-human monoclonal antibody against ApoJ (coating) | R&D Systems | MAB29372 | 3 ug/mL |
| mouse anti-human monoclonal antibody against ApoJ, biotin conjugate (detection) | R&D Systems | BAM29373 | 1 ug/mL |
| rabbit anti-human polyclonal antibody against ApoL1 (coating) | Proteintech | 11486-2-AP | 5 ug/mL |
| rabbit anti-human polyclonal antibody against ApoL1 (Biotin conjugate prepared in lab) (detection) | Proteintech | 11486-2-AP | 1 ug/mL |

**Major Resources Table. Antibodies used to determine protein concentrations by ELISA.**
Levels (mg/dL) of ApoA1, ApoA2, ApoC3, ApoE, ApoJ, and ApoL1 in plasma and on HDL were measured in participants #1-12 and participants #1-6, respectively, on both diets by enzyme-linked immunosorbent assay (ELISA) using the antibodies listed.