*Table S1*: List of genes Taqman IDs

|  |  |  |
| --- | --- | --- |
| **Gene ID** | **Gene names** | **Probe ID** |
| **RPLPo**  | Ribosomal protein lateral stalk subunit PO | Hs99999902\_m1 |
| **ADIPOQ** | Adiponectin | Hs00605917\_m1 |
| **MCP1** | Monocyte chemoattractant protein 1 | Hs00234140\_m1 |
| **IL10**  | Interleukin 10 | Hs00961622\_m1 |
| **LEP** | Leptin | Hs00174877\_m1 |
| **MIF**  | Macrophage migration inhibitory factor | Hs00236988\_g1 |
| **NFκB1** | Nuclear factor-kappa B1 | Hs00765730\_m1 |
| **TLR4**  | Toll like receptor 4 | Hs01060206\_m1 |
| **TNFα** | Tumour necrosis factor-alpha | Hs00174128\_m1 |
| **PPARγ** | Peroxisome proliferator activator receptor gamma | Hs01115513\_m1 |
| **LPL** | Lipoprotein lipase | Hs00173425\_m1 |
| **DGAT2** | Diacylglycerol acyltransferase 2 | Hs01045913\_m1 |
| **PLIN1** | Perilipin 1 | Hs00160173\_m1 |
| **ATGL** | Adipose triglyceride lipase | Hs00386101\_m1 |
| **IRS1** | Insulin receptor substrate 1 | Hs00178563\_m1 |
| **GLUT4** | Glucose transporter 4 | Hs00168966\_m1 |
| **SMG1** | Serine/threonine-protein kinase | Hs00979691\_m1 |

***Table S2***: Changes in anthropometry, cardiorespiratory fitness, insulin sensitivity and systemic inflammation in response to the 12-week exercise intervention in exercise and control groups.

|  |  |  |  |
| --- | --- | --- | --- |
| **Variables** | **Control (n=15)** | **Exercise (n=20)** | **Interaction** |
|  | **Pre** | **Post** | **Pre** | **Post** | **P-Value** |
| ***Cardiorespiratory fitness*** |
| VO2peak (ml/min) | 2099 ± 282 | 2032 ± 196 | 2077 ± 211 | 2278 ± 231# | **0.001** |
| VO2peak (ml/kg) | 23.90 ± 2.97 | 22.98 ± 2.64 | 24.91 ± 2.24 | 27.58 ± 3.39# | **<0.001** |
| ***Body composition*** |
| Weight (kg) | 87.8 ± 2.5 | 88.8 ± 2.5 \*\* | 84.1 ± 2.2 | 83.3 ± 2.2\*\* | **0.003** |
| BMI (kg/m²) | 33.4 ± 0.7 | 33.8 ± 0.7\*\* | 34.1 ± 0.6 | 33.8± 0.6\*\* | **0.003** |
| WC (cm) | 103.4 ± 2.1 | 106.1 ± 2.1\*\*\* | 103.6± 1.8 | 100.4 ± 1.8\*\* | **<0.001** |
| Body FM (%) | 50.4 ± 0.9 | 50.6 ± 0.9 | 50.2 ± 0.8 | 50.1 ± 0.8 | 0.471 |
| Android FM (%) | 8.0 ± 0.3 | 7.9 ± 0.30 | 8.3 ± 0.3 | 8.1 ± 0.3 | 0.860 |
| Gynoid FM (%) | 19.4 ± 0.5 | 19.5 ± 0.5 | 18.5 ±0.4 | 18.2 ± 0.4# | **0.002** |
| VAT (cm3) | 931.1 ± 427.1 | 968.7 ±392.4 | 920.0 ±322.1 | 906.2 ± 346.9 | 0.196 |
| SAT (cm3) | 5440.3 ± 1858.0 | 5532.8 ± 1890.0\* | 5489.3 ±1053.4 | 5444.7 ± 1260.7 | **0.026** |
| ***Ectopic fat*** |  |  |  |  |  |
| Liver fat % | 4.72 (4.33-5.41)  | 4.54 (4.21-5.29) | 5.23 (4.47-6.47) | 4.84 (3.93-5.52) | *0.069* |
| ***Insulin sensitivity*** |
| SIx10-4(mU/L)-1min-1 | 2.01 (1.29-3.24) | 1.83 (1.65-2.64) | 2.04 (1.20-2.77) | 2.17 (1.45-3.69)\* | **0.045** |
|  |  |  |  |  |  |
| ***Circulating inflammatory markers***  |
| hsCRP (mg/L) | 2.5 (1.9-8.0) | 4.02 (2.8-9.6) | 5.0 (2.1-11.5) | 4.6 (2.8-9.0) | 0.225 |
| TNFα (pg/mL) | 7.0 (3.8-8.5) | 6.4 (3.7-9.3) | 4.1 (3.27-7.8) | 4.6 (4.0-6.3) | 0.515 |
| MCP1 (pg/mL) | 487.0 (334.9-537.7) | 453.3 (356.6-608.3) | 283.6 (237.5-370.3) | 302.8 (235.4-431.1) | 0.358 |
| IL-8 (pg/mL) | 3.0 (2.3-5.5) | 4.0 (1.1-6.7) | 2.3 (0.2-4.1) | 2.3 (1.7-5.1) | 0.377 |
| Leptin (ng/mL) | 67.1 (57.2-79.3) | 75.7 (53.7-80.2) | 62.5 (47.3-81.5) | 63.4 (46.7-79.1) | 0.613 |
| Adiponectin (µg/mL) | 3.9 (3.3-5.2) | 3.6 (2.0-4.7) | 3.3 (1.9-5.0) | 2.1 (1.3-3.3) | 0.793 |
| ***Abdominal SAT inflammatory markers*** |
| *MCP1* mRNA (AU) | 0.89 (0.66-1.20) | 1.21 (0.97-2.63) | 0.69 (0.42-1.38) | 1.13 (0.55-1.77) | 0.442 |
| *IL10* mRNA (AU) | 0.74 (0.22-1.17) | 0.61 (0.41-1.28) | 0.58 (0.23-1.07) | 0.74 (0.44-1.06) | 0.761 |
| *Leptin* mRNA (AU) | 0.92 (0.53-1.35) | 0.75 (0.46-1.70) | 1.08 (0.75-1.58) | 0.77 (0.52-1.07) | 0.367 |
| *MIF* mRNA (AU) | 0.67 (0.47-0.90) | 0.68 (0.56-0.79) | 0.70 (0.59-11.12) | 0.68 (0.56-0.79) | 0.767 |
| *NFκB1* mRNA (AU) | 1.37 (1.10-1.94) | 1.27 (0.93-1.72) | 1.31 (1.05-2.16) | 1.55 (1.05-2.04) | 0.196 |
| *TLR4* mRNA (AU) | 1.28 (0.91-3.35) | 1.51 (0.96-3.25) | 1.38 (0.88-2.09) | 1.50 (1.01-2.19) | 0.270 |
| *TNFα* mRNA (AU) | 0.73 (0.55-1.09) | 1.11 (0.76-1.74) | 1.03 (0.66-1.32) | 1.33 (0.65-1.72) | 0.722 |
| ***Gluteal SAT inflammatory markers*** |
| *MCP1* mRNA (AU) | 1.24 (0.90-1.96) | 1.09 (0.66-2.26) | 1.65 (0.82-3.00) | 1.48 (1.21-2.34) | 0.234 |
| *IL10* mRNA (AU) | 0.61 (0.46-0.78) | 0.55 (0.45-0.77) | 0.66 (0.41-0.87) | 1.22 (0.75-2.29) | **0.016\*** |
| *Leptin* mRNA (AU) | 1.15 (0.96-2.30) | 1.01 (0.72-1.36) | 1.35 (0.87-2.00) | 1.23 (0.75-1.41) | 0.452 |
| *MIF* mRNA (AU) | 0.67 (0.47-0.76) | 0.56 (0.34-0.66) | 0.73 (0.63-0.86) | 0.88 (0.59-1.06) | **0.037\*** |
| *NFκB1* mRNA (AU) | 1.13 (0.98-1.71) | 1.04 (0.79-1.33) | 1.43 (1.25-1.62) | 1.64 (1.28-1.90) | **0.087** |
| *TLR4* mRNA (AU) | 1.37 (0.81-1.96) | 1.69 (0.85-2.27) | 1.51 (1.01-2.23) | 1.49 (1.16-2.83) | 0.710 |
| *TNFα* mRNA (AU) | 1.00 (0.58-1.15) | 0.68 (0.43-1.51) | 1.07 (0.84-1.33) | 1.33 (0.95-1.90) | 0.189 |

*Data presented as means ± SD for normally distributed variables and median (25th-75th percentile) for skewed variables;* *\*\*P<0.01 and \*\*\*p<0.001 represent the difference between the groups after the intervention and* ***#****P<0.05,* ***#****P<0.01 and* ***#****P<0.001 represents the difference post vs pre in the exercise group.* *BMI: body mass index; WC: waist circumference; FM: fat-mass; VAT: visceral adipose tissue; SAT: subcutaneous adipose tissue; VO2 max: maximal oxygen uptake, used as a measure of cardiorespiratory fitness; SI: insulin sensitivity; hsCRP: high-sensitive C-reactive protein; TNFα: tumour necrosis factor-alpha; IL-8: interleukin 8; MCP1: monocyte chemoattractant protein 1; IL10: interleukin 10; MIF: macrophage migration inhibitory factor; NFκB1: nuclear factor-kappa B subunit 1; TLR4: toll-like receptor 4.*

***Table S3:*** Daily energy, macronutrient and fat intake at baseline and after the 12-week exercise training intervention in both groups.

|  |  |  |  |
| --- | --- | --- | --- |
| **Variables** | **Control (n=15)** | **Exercise (n=20)** | **Interaction** |
|  | **Pre** | **Post** | **Pre** | **Post** | **P-Value** |
| **Energy (kJ)** | 12102 (7571-14377)  | 10743 (8479-12547) | 13546 (10162-15580) | 11597 (10542-14506) | 0.359 |
| **Total protein (g)** | 74.8 (59.4-114-2) | 73.8 (70.4-95.9) | 101.1 (90.0-115.1) | 89.7 (83.0-106.2) | 0.418 |
| **Protein (%E)** | 13.8 (11.4-14.3) | 13.6 (12.7-14.5) | 13.2 (12.4-13.9) | 12:8 (12:0-14:1) | 0.346 |
| **Total Fat (g)** | 113.0 (58.1-125.5) | 85.7 (76.2-107.2) | 115.5 (86.7-135.8) | 100.5 (80.7-124.7) | 0.241 |
| **Fat (% E)** | 34.0 (28.4-36.1) | 32.2 (29.5-35.4) | 33.3 (31.7-37.1) | 31.5 (29.7-34.4) | 0.288 |
| **Total CHO (g)** | 352.9 (246.3-435.4) | 318.4 (271.9-411.6) | 413.4 (312.3-484.8) | 363.8 (286.0-429.4) | 0.189 |
| **CHO (%E)** | 53.2 (49.1-56.4) | 54.2 (49.2-55.9) | 52.6 (49.8-54.2) | 53.5 (50.4-56.1) | 0.645 |
| **SFA (g)** | 29.1 (18.8-40.6) | 25.1 (21.7-38.6) | 34.4 (22.9-44.5) | 29.6 (23.7-37.7) | 0.237 |
| **SFA (%E)** | 9.1 (4.1-11.8) | 9.7 (8.2-11.3) | 9.5 (7.9-11.3) | 9.55 (8.0-10.2) | 0.327 |
| **MUFA (g)** | 35.7 (19.2-41.6) | 29.9 (23.5-35.3) | 40.7 (31.1-51.6) | 34.4 (28.4-3.6) | 0.324 |
| **MUFA (%E)** | 11.2 (9.6-12.2) | 11.5 (10.0-12.2) | 11.1 (10.7-12.9) | 11.2 (9.4-12.5) | 0.172 |
| **PUFA (g)** | 26.6 (15.5-34.5) | 18.5 (15.6-22.5) | 25.8 (0.7-36.2) | 22.6 (18.2-29.8) | 0.479 |
| **PUFA (%E)** | 7.9 (7.2-10.1) | 7.1 (6.4-8.4) | 7.9 (7.2-9.6) | 7.5 (6.6-8.2) | 0.717 |

*Data presented as median (25th and 75th percentiles). kJ: kilojoules; CHO: carbohydrate; SFA: saturated fatty acid; MUFA: monounsaturated fatty acid; PUFA: polyunsaturated fatty acid.*