

Table S1. The compositions of the experimental diets (g/100g)

Ingredient	CON ¹	HF ²	HF+MR ³	C* ⁴	C*+MR ⁵
Soy protein ⁶	7.59	7.59	7.59	7.59	7.59
L-Arginine	0.66	0.66	0.66	0.66	0.66
L-Histidine	0.18	0.18	0.18	0.18	0.18
L-Isoleucine	0.51	0.51	0.51	0.51	0.51
L-Leucine	0.64	0.64	0.64	0.64	0.64
L-Lysine	0.11	0.11	0.11	0.11	0.11
L-Methionine	0.69	0.69	0.00	0.69	0.00
L-Phenylalanine	0.85	0.85	0.85	0.85	0.85
L-Threonine	0.65	0.65	0.65	0.65	0.65
L-Tryptophan	0.10	0.10	0.10	0.10	0.10
L-Valine	0.57	0.57	0.57	0.57	0.57
L-Glutamic acid	1.37	1.37	2.06	1.37	2.06
L-Glycine	2.08	2.08	2.08	2.08	2.08
Corn starch	64.10	44.30	44.30	64.10	64.10
maltodextrin	5.00	5.00	5.00	5.00	5.00
Sucrose	0.10	0.10	0.10	0.10	0.10
Soybean oil	2.00	2.00	2.00	2.00	2.00
Pork Lard	2.20	22.00	22.00	2.20	2.20
Cellulose	5.00	5.00	5.00	5.00	5.00
Mineral mixture-AIN-76A	3.50	3.50	3.50	3.50	3.50

Mineral vitamin-AIN-76A	1.00	1.00	1.00	1.00	1.00
Choline chloride	0.10	0.10	0.10	0.10	0.10
CMC	1.00	1.00	1.00	1.00	1.00
Total	100.00	100.00	100.00	100.00	100.00

¹CON, control diet, was mainly based upon the AIN-76A formulation; 73%, 17% and 10% of calories from carbohydrate, protein, and fat, respectively; energy density 3.8kcal/g.

²HF, high fat diet, 41%, 14% and 45% of calories from carbohydrate, protein, and fat, respectively; energy density 4.7 kcal/g.

³HF+MR, high-fat and 80%-methionine-restricted diet, 41%, 14% and 45% of calories from carbohydrate, protein, and fat, respectively; energy density 4.7 kcal/g; the content of methionine was 0.17%; The glutamic acid was increased to compensate for the reduced methionine content and to create equal amounts of total amino acids.

⁴C*, control diet, was mainly based upon the AIN-76A formulation; 73%, 17% and 10% of calories from carbohydrate, protein, and fat, respectively; energy density 3.8kcal/g.

⁵C*+MR, control diet and 80%-methionine-restricted diet, 73%, 17% and 10% of calories from carbohydrate, protein, and fat, respectively; energy density 3.8kcal/g; the content of methionine was 0.17%; The glutamic acid was increased to compensate for the reduced methionine content and to create equal amounts of total amino acids.

⁶ Amino acid composition of soy protein were as follows: 6.19% leucine, 4.11% isoleucine, 5.49% valine, 1.18% methionine, 1.66% cysteine, 4.09% phenylalanine, 2.57% tyrosine, 4.83% lysine, 2.21% threonine, 1.07% tryptophan, 1.99% histidine, 6.11% arginine, 3.30% serine, 3.25% alanine,

5.56% proline, 3.27% glycine, 17.49% glutamic acid 9.44% aspartic acid. 1 g cysteine is equal to 0.64 g methionine (Di et al. 2001).

Table S2. A list of the qPCR primers

<i>Gene name</i>	<i>Forward primer (5' to 3')</i>	<i>Reverse primer (5' to 3')</i>
<i>AdipoR1</i>	AATGGGGCTCCTTCTGGTAAC	GGATGACTCTCCAACGTCCT
<i>Akt</i>	CGGGCACATCAAGATAACG	CGTGGTCCTGGTTGTAGAAG
<i>AMPK</i>	GTTGTAAACCCCTATTATTTGCGTG	TGGAGTAGCAGTCCCTGATTTGG
<i>CSE</i>	TTCCTGCCTAGTTTCCAGCAT	GGAAGTCCTGCTTAAATGTGGTG
<i>DsbA-L</i>	GGTCCTATGCAGATACCAACAC	GTACTGGCCTTTTCGGGGAA
<i>GLUT4</i>	CCTTTGCACACGGCTTCCGA	TGTTCAATCACCTTCTGTGGGGCA
<i>Gsk-3β</i>	TTGGACAAAGGTCTTCCGGCCC	TGCAGGTGTGTCTCGCCCAT
<i>HK2</i>	TGCTGCCGACCTTTGTGA	AAGGTCCAGAGCCAGGAACTC
<i>IRS-1</i>	GCAGCAGTAGCAGCATCAG	TACCGCCACCACTCTCAAC
<i>mtDNA</i>	GCCAGCCTGACCCATAGCCATAAT	GCCGGCTGCGTATTCTACGTTA
<i>mTORC1</i>	AGGAACTAGAGGTAGCTGCGATTAA	GAGTGGTGAGGCAGGATGTGAA
<i>Notch1</i>	CCGACCAGCTACGGAACAAC	CAAAGAACAGGAGCACGAAGG
<i>nDNA</i>	TTGAGACTGTGATTGGCAATGCCT	CCAGAAATGCTGGGCGCTCACT
<i>PFK</i>	TGTGGTCCGAGTTGGTATCTT	GCACTTCCAATCACTGTGCC
<i>PGC-1α</i>	CAAGCCAAACCAACAACCTTATCTC	AAGCCTTGAAAGGGTTATCTTGGT
<i>PI3K</i>	TGCTCCGTAGTGGTAGAC	GTATGCTAGTGTGACATTGAG
<i>PKM</i>	AGGGGCACCCAAGTACATC	TGCCGGAGGAAAGTGAATGAC

<i>S6K1</i>	GGCAATGATAGTGAGGAATG	CGGTCTGAAAGGCATAAATC
<i>STAT3</i>	CTGCTAAGATGCCGCTGAAAAT	GTAGAGCCATACACCAAGCAGC
<i>TFAM</i>	ATCCCCTCGTCTATCAGTCTTGTCT	TTCTGCTTCTGGTAGCTCCCTC
<i>β-actin</i>	GGCTGTATTCCCTCCATCG	CCAGTTGGTAACAATGCCATG

AdipoR1, adiponectin receptor 1; *Akt*, protein kinase B; *AMPK*, AMP-activated protein kinase; *CSE*, cystathionine-gamma-lyase; *DsbA-L*, disulfide-bond A oxidoreductase-like protein; *GLUT4*, glucose transporter 4; *Gsk-3β*, glycogen synthase kinase-3β; *HK2*, hexokinase2; *IRS-1*, insulin receptor substrate 1; *mtDNA*, Mitochondrial DNA; *nDNA*, nuclear DNA; *mTORC1*, mammalian target of rapamycin complex 1; *PFK*, phosphate fructose kinase; *PGC-1α*, peroxisome proliferator-activated receptor gamma coactivator 1-alpha; *PI3K*, phosphoinositide 3-kinase; *PKM*, pyruvate kinase; *S6K1*, S6 Kinase 1; *STAT3*, transducer and activator of transcription 3; *TFAM*, mitochondrial transcription factor A.

Reference

Di BM, Wykes LJ, Ball RO, Pencharz PB (2001) Dietary cysteine reduces the methionine requirement in men. *American Journal of Clinical Nutrition* 74 (6):761