

Supplementary materials

Supplementary Table S1: Natural abundances of nitrogen and carbon stable isotopes ($\delta^{15}\text{N}$ and $\delta^{13}\text{C}$, ‰) in dietary macronutrients and in dietary protein-bound amino acids (means of triplicate determination).

	$\delta^{15}\text{N}$ (‰)	$\delta^{13}\text{C}$ (‰)
Lipids		-29.12
Carbohydrates		-15.59
Protein	5.78	-22.10
Ala	6.18	-22.09
Asx	7.31	-21.61
Glx	8.41	-18.61
Gly	6.46	-24.47
Pro	6.59	-20.51
Ile	6.16	-26.14
Leu	5.02	-32.48
Val	8.63	-29.72
Met	6.10	-24.31
Phe	8.22	-27.85
Lys	6.63	-16.88

Supplementary Table S2: qPCR primers used for cDNA amplifications

Gene	Primers	Sequence
<i>Aass</i>	Forward	GGA-GCC-CCA-TGA-ATT-AAA-AGA-A
	Reverse	ACT-TAA-CAC-CGT-CCC-ATA-CAC-TTT-C
<i>Arg1</i>	Forward	GGT-CCC-GCA-GCA-TTA-AGG-A
	Reverse	GGT-CCC-GCA-GCA-TTA-AGG-A
<i>Asns</i>	Forward	CCA-TCA-CTG-TAC-GGA-TGA-ACC-A
	Reverse	CGG-TCA-GTC-ATC-AAG-CGT-TTC
<i>Bckdha</i>	Forward	GTG-GGA-TGA-GGA-ACA-GGA-GAA-G
	Reverse	GGC-TTG-GGT-TGG-GCT-TTA-G
<i>Gls2</i>	Forward	CGA-CTT-GGT-GAC-CTG-CTT-TTC-T
	Reverse	TTC-AGG-GCC-GTG-GTG-AAC
<i>Gpt1</i>	Forward	AGG-GTG-GAG-TAT-GCA-GTT-CGA
	Reverse	TGG-CAC-GGA-TGA-CCT-CAG-T
<i>Hal</i>	Forward	AAG-ATG-TGG-TCC-CCG-AAG-AGT
	Reverse	GTG-CCA-GGC-CTT-CTT-TTG-G
<i>Oat</i>	Forward	TGG-TGG-CTT-ATA-TCC-CGT-GTC-T
	Reverse	TGC-TCG-CCT-GGT-TTA-ATG-GT
<i>Pycr2</i>	Forward	TGC-AGC-TCT-CTT-GTT-CGA-ATA-CA
	Reverse	GCT-TCC-GCT-CTC-TGC-TCA-TC
<i>Sds</i>	Forward	CAT-CCC-AGC-CAC-TAT-CGT-TGT
	Reverse	CAG-CAT-CTC-TCC-CAC-CAC-TTC
<i>Tat</i>	Forward	AAG-GCA-GTG-TGT-CCC-CAT-CT
	Reverse	TGC-AAT-CTG-AAA-ACA-CCA-TGT-CA

Supplementary Table S3: Natural abundances of nitrogen stable isotopes in tissue protein-bound amino acids (AA) ($\Delta^{15}\text{N}_{\text{tissue AA}} = \delta^{15}\text{N}_{\text{tissue AA}} - \delta^{15}\text{N}_{\text{diet AA}}$, ‰). Data are means \pm standard error for rats with ad-libitum (AL) access to food (AL group, n=8) or submitted to a gradual caloric restriction (CR group, n=8). Non-transaminating and indispensable (NTI) AA.

Amino acid	Group	Intestine	Plasma	<i>Gastrocnemius</i> muscle	Heart	Tissue effect	Group effect
Ala	AL	3.87 \pm 0.19	7.59 \pm 0.36	6.27 \pm 0.41	9.07 \pm 0.42	<0.001	NS
	CR	4.75 \pm 0.27	7.24 \pm 0.37	6.70 \pm 0.34	8.96 \pm 0.61		
Asx	AL	5.25 \pm 0.10	6.00 \pm 0.35	3.69 \pm 0.15	6.43 \pm 0.35	<0.001	NS
	CR	5.14 \pm 0.42	5.48 \pm 0.21	3.24 \pm 0.19	6.97 \pm 0.30		
Glx	AL	4.52 \pm 0.41	5.80 \pm 0.32	5.34 \pm 0.69	7.25 \pm 0.59	<0.001	NS
	CR	5.40 \pm 0.54	5.15 \pm 0.69	5.55 \pm 0.24	8.69 \pm 0.40		
Gly	AL	2.68 \pm 0.36	6.28 \pm 0.25	4.28 \pm 0.50	5.38 \pm 0.41	<0.001	NS
	CR	3.11 \pm 0.60	5.19 \pm 0.31	4.13 \pm 0.58	5.37 \pm 0.54		
Pro	AL	6.12 \pm 0.44	13.07 \pm 0.24	5.28 \pm 0.19	8.08 \pm 0.30	<0.001	NS
	CR	6.87 \pm 0.26	11.57 \pm 0.37	5.17 \pm 0.20	7.51 \pm 0.31		
Ile	AL	6.08 \pm 0.25	4.35 \pm 0.18	4.78 \pm 0.65	10.17 \pm 0.36	<0.001	<0.05
	CR	3.46 \pm 0.55	4.15 \pm 0.29	4.35 \pm 0.16	10.96 \pm 0.35		
Leu	AL	5.36 \pm 0.20	4.64 \pm 0.18	5.38 \pm 0.27	8.61 \pm 0.13	<0.001	<0.05
	CR	4.41 \pm 0.28	3.92 \pm 0.25	5.86 \pm 0.17	8.52 \pm 0.37		
Val	AL	5.33 \pm 0.91	5.15 \pm 0.17	3.60 \pm 0.57	6.82 \pm 0.27	<0.001	<0.05
	CR	2.83 \pm 0.60	3.21 \pm 0.43	3.30 \pm 0.22	7.50 \pm 0.38		
Lys (NTI)	AL	-3.01 \pm 0.24	-1.75 \pm 0.18	-1.98 \pm 0.46	-1.62 \pm 0.26	<0.001	<0.001
	CR	-0.80 \pm 0.28	-0.64 \pm 0.41	-0.29 \pm 0.29	-2.99 \pm 0.17		
Met (NTI)	AL	2.52 \pm 0.36	4.58 \pm 0.29	2.80 \pm 0.53	4.55 \pm 0.40	<0.001	NS
	CR	2.42 \pm 0.49	2.61 \pm 0.61	3.76 \pm 0.26	5.35 \pm 0.52		
Phe (NTI)	AL	0.19 \pm 0.19	0.89 \pm 0.19	0.84 \pm 0.64	0.66 \pm 0.34	NS	NS
	CR	2.29 \pm 0.22	0.26 \pm 0.31	1.38 \pm 0.44	1.17 \pm 0.17		

Supplementary Table S4: Natural abundances of carbon stable isotopes in tissue protein-bound amino acids ($\Delta^{13}\text{C}_{\text{tissue AA}} = \delta^{13}\text{C}_{\text{tissue AA}} - \delta^{13}\text{C}_{\text{diet AA}}$, ‰). Data are means \pm standard error for rats with ad-libitum access to food (AL group, n=8) or submitted to a gradual caloric restriction (CR group, n=8). Indispensable (I) AA.

Amino acid	Group	Intestine	Plasma	<i>Gastrocnemius</i> muscle	Heart	Tissue effect	Group effect
Ala	AL	2.91 \pm 0.30	2.90 \pm 0.11	5.12 \pm 0.34	5.67 \pm 0.31	<0.001	<0.001
	CR	1.63 \pm 0.26	0.72 \pm 0.23	2.18 \pm 0.18	2.20 \pm 0.27		
Asx	AL	3.56 \pm 0.37	6.49 \pm 0.26	1.20 \pm 0.39	2.93 \pm 0.91	<0.001	<0.001
	CR	1.52 \pm 0.49	5.61 \pm 0.20	0.58 \pm 0.29	0.01 \pm 0.97		
Glx	AL	-0.05 \pm 0.15	0.97 \pm 0.13	-0.85 \pm 0.15	-1.65 \pm 0.17	<0.001	<0.001
	CR	-0.79 \pm 0.21	0.22 \pm 0.19	-1.77 \pm 0.26	-2.62 \pm 0.11		
Gly	AL	4.07 \pm 0.55	10.48 \pm 1.22	5.28 \pm 0.55	7.20 \pm 1.08	<0.001	<0.05
	CR	3.49 \pm 0.41	4.55 \pm 1.41	4.81 \pm 0.48	6.46 \pm 0.88		
Pro	AL	2.43 \pm 0.23	4.41 \pm 0.04	1.18 \pm 0.15	2.57 \pm 0.28	<0.001	NS
	CR	1.86 \pm 0.17	4.23 \pm 0.24	1.28 \pm 0.30	2.64 \pm 0.32		
Ile (I)	AL	1.10 \pm 0.12	0.85 \pm 0.08	1.76 \pm 0.19	2.16 \pm 0.09	<0.001	<0.05
	CR	1.60 \pm 0.14	1.15 \pm 0.19	2.31 \pm 0.18	2.01 \pm 0.15		
Leu (I)	AL	1.77 \pm 0.30	1.21 \pm 0.10	1.64 \pm 0.13	0.57 \pm 0.19	<0.001	NS
	CR	0.92 \pm 0.20	1.01 \pm 0.09	1.91 \pm 0.09	0.87 \pm 0.24		
Val (I)	AL	2.37 \pm 0.18	1.82 \pm 0.41	2.38 \pm 0.31	2.52 \pm 0.30	NS	NS
	CR	2.01 \pm 0.40	1.97 \pm 0.51	2.32 \pm 0.19	3.17 \pm 0.23		
Lys (I)	AL	-3.34 \pm 0.37	-2.63 \pm 0.48	-3.96 \pm 0.55	-3.40 \pm 0.53	NS	<0.05
	CR	-2.68 \pm 0.36	-2.14 \pm 0.31	-2.68 \pm 0.41	-2.35 \pm 0.56		
Met (I)	AL	-2.45 \pm 0.28	-3.28 \pm 0.15	-3.63 \pm 0.12	-2.85 \pm 0.34	<0.001	NS
	CR	-2.55 \pm 0.21	-3.88 \pm 0.11	-2.50 \pm 0.19	-2.89 \pm 0.17		
Phe (I)	AL	0.31 \pm 0.16	0.29 \pm 0.04	0.23 \pm 0.08	-0.13 \pm 0.12	<0.001	NS
	CR	0.22 \pm 0.10	0.10 \pm 0.07	0.77 \pm 0.17	-0.08 \pm 0.06		