Figure S1. Weight changes during dietary treatment for 30-days with ST diet (black), HF diet (blue), HP diet (brown) and CF diet (red). Values are the mean ± standard error (n=6-8 animals/group). Values for two-way ANOVA are indicated. Post hoc test differences: The beginning of statistical differences is indicated by a vertical green line. Males: CF group showed differences versus ST, HP and HF groups from day 25 onwards. Females: CF group showed differences versus HP group from day 12 onwards.

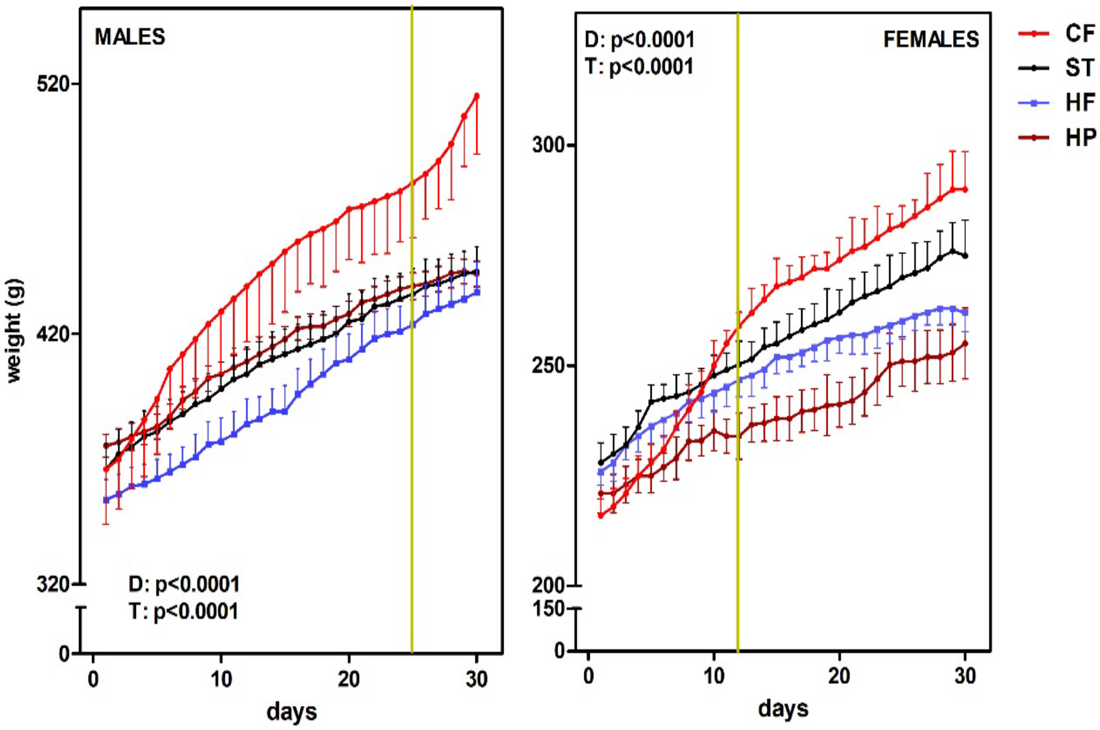

Figure S2. Weekly energy intake by rats treated with HP, ST, HF and CF diets for four weeks treatment. Mean energy intakes (MJ/animal) are depicted.

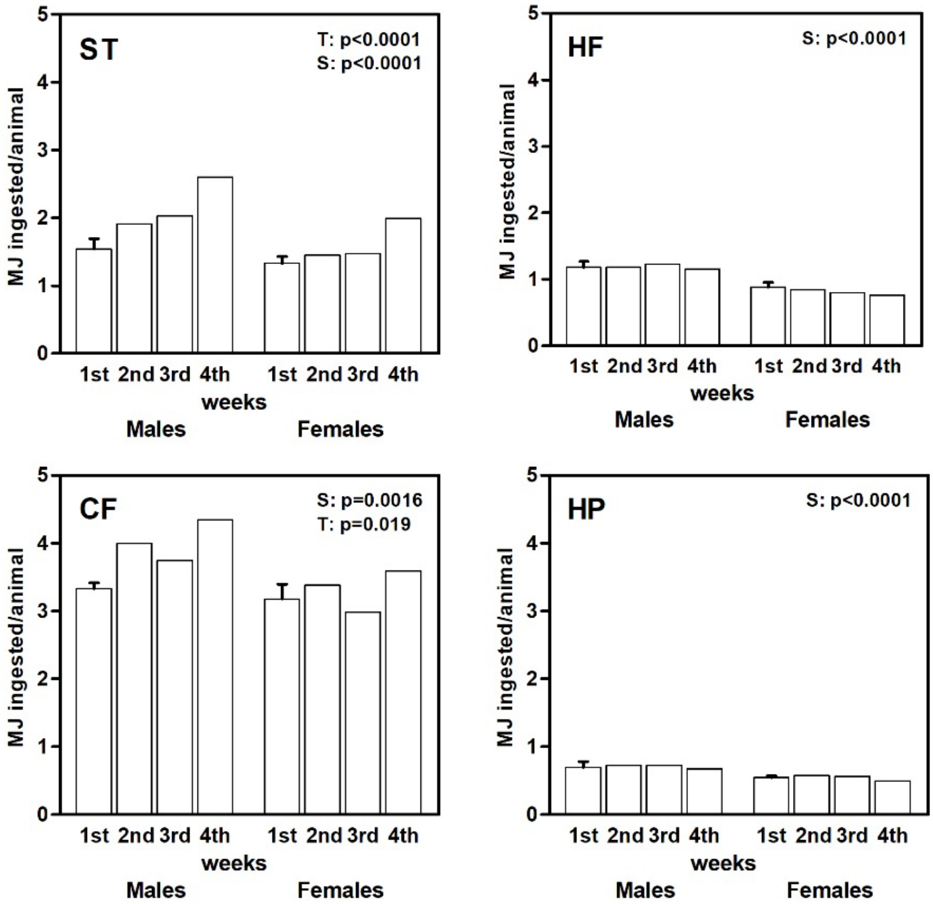

Table S1. Composition of diets.

	Standard diet (SD)	High-fat diet (HF)	Cafeteria diet* (CF)	High-protein diet (HP)
Crude energy content (kJ/g)	16.5	18.8	12.4 ± 0.2	17.4
Digestible energy content (kJ/g)	12.1	14.6	12.0 ± 0.1	12.4
Gross Composition (%)				
Protein	14.3	11.6	7.96 ± 0.4	28.7
Lipid	4.0	13.4	11.6 ± 0.9	3.89
Carbohydrate	48.0	39.1	31.7 ± 0.5	33.7
Fibre	18.0	14.6	2.79 ± 0.2	12.9
Ashes	4.70	3.82	2.79 ± 0.1	3.30
Moisture	6.90	12.4	47.2 ± 1.2	12.3
% energy derived from main				
Protein	19.3	14.5	11.7 ± 0.4	40.4
Lipid	12.5	36.8	39.5 ± 0.9	11.6
Carbohydrate	67.1	48.6	48.5 ± 0.5	47.7
Sugars (as % of carbohydrate)	<1	<1	24.1 ± 0.5	<1
Lipid/Protein ratio	0.625	2.53	3.39 ± 0.2	
Components of diet (g/kg)				
Chow pellet	1000	901	113 ± 8	804
Coconut oil		99		
Gelatin				100
Casein				87
Bacon			123 ± 1.1	
Cookies (plain)			209 ± 15	
Liver Paté			126 ± 13	
Cow's milk			335 ± 25	
Sunflower oil				9
Saccharose			101 ± 12	

*Data obtained from the food consumption data of the animals fed cafeteria diet (mean male value
There were no significant differences in the intake between male and female animals.

Part of these data have been previously published in Br. J. Nutr. (2022), 128: 1499-1508

Table S2. Diet's amino acid composition (g/kg)

	ST	HP	CF				HF
			Cookies	*Paté*	*Milk*	*Bacon*	
Asx	9,00	17,80	1,59	11,17	2,39	17,30	6,32
Glx	29,00	48,90	14,30	19,90	6,29	26,90	20,36
Ala	9,00	17,20	1,25	4,09	0,71	7,38	6,32
Gly	7,00	28,80	1,88	7,50	0,60	13,80	4,91
Thr	5,00	9,28	1,43	4,99	1,31	10,10	3,51
Pro	12,00	40,30	6,44	7,70	2,99	10,80	8,43
Ser	7,00	13,60	1,99	5,25	1,58	7,45	4,91
Leu	14,00	21,40	3,14	9,04	2,62	12,10	9,83
Ile	6,00	10,70	1,70	5,63	1,57	8,91	4,21
Val	7,00	13,50	1,64	6,78	1,76	9,01	4,91
Phe	7,00	11,70	2,14	5,28	1,32	6,76	4,91
Tyr	4,00	8,26	0,36	3,26	0,72	4,34	2,81
Met	3,00	5,47	1,31	2,37	0,71	1,06	2,11
Cys	3,00	2,48	1,22	1,42	0,20	1,06	2,11
Lys	7,00	15,72	0,58	8,03	1,75	14,16	4,91
His	4,00	6,27	1,24	2,33	1,08	4,81	2,81
Arg	8,00	15,50	1,22	6,96	1,04	13,05	5,62
Trp	2,00	2,67	0,84	1,31	0,39	0,14	1,40

HP diet composition include the addition of Teklad diet protein, casein and gelatin in the proportion: 2,36 g from chow, 2,35 g from casein and 2,05 g from gelatin.

Table S3. Mean amino acid intake expressed in mmol/g mean weight$^{0.75}$.

(m= males, *f= females*)

		HP	HF	ST	CF
Asx	m	1.16	0.32	0.46	0.54
	f	*0.79*	*0.31*	*0.71*	*0.90*
Glx	m	2.85	0.94	1.37	1.59
	f	*1.65*	*0.92*	*1.58*	*2.07*
Ala	m	1.69	0.48	0.69	0.81
	f	*1.19*	*0.47*	*0.52*	*0.66*
Gly	m	2.24	0.44	0.64	0.75
	f	*1.65*	*0.43*	*0.88*	*1.08*
Thr	m	0.66	0.20	0.29	0.34
	f	*0.37*	*0.19*	*0.44*	*0.56*
Pro	m	3.13	0.49	0.72	0.83
	f	*1.09*	*0.48*	*0.85*	*1.12*
Ser	m	1.11	0.31	0.45	0.53
	f	*1.05*	*0.31*	*0.52*	*0.67*
Leu	m	1.38	0.51	0.74	0.86
	f	*0.68*	*0.49*	*0.71*	*0.92*
Ile	m	0,69	0.21	0.31	0.36
	f	*0.46*	*0.21*	*0.42*	*0.54*
Val	m	0.98	0.28	0.41	0.48
	f	*0.59*	*0.28*	*0.52*	*0.67*
Phe	m	0.60	0.20	0.29	0.34
	f	*0.38*	*0.18*	*0.31*	*0.41*
Tyr	m	0.38	0.10	0.15	0.18
	f	*0.30*	*0.10*	*0.15*	*0.19*
Met	m	0.31	0.09	0.13	0.16
	f	*0.16*	*0.09*	*0.03*	*0.04*
Cys	m	0.46	0.11	0.17	0.19
	f	*0.21*	*0.11*	*0.04*	*0.05*
Lys	m	0.93	0.22	0.33	0.38
	f	*0.33*	*0.22*	*0.43*	*0.61*
His	m	0.34	0.12	0.17	0.21
	f	*0.16*	*0.12*	*0.20*	*0.27*
Arg	m	0.77	0.21	0.31	0.36
	f	*0.30*	*0.21*	*0.37*	*0.47*
Trp	m	0.10	0.05	0.07	0.07
	f	*0.06*	*0.05*	*0.01*	*0.02*
TOTAL	m	17.1	5.35	8.24	9.04
	f	*14.6*	*5.25*	*8.78*	*11.3*

Table S4. Diet's fatty acid composition (g/kg)

Diet		ST	HP	CF				HF
Fatty acids								
Saturated				Cookies	Paté	Milk	Bacon	
	C10	-		6,40	0,23	0,34	0,88	4,29
	C12	0,21	0,17	44,20	0,47	0,37	0,49	37,80
	C14	0,34	0,27	14,90	2,69	1,70	3,59	13,30
	C16	6,91	5,58	24,70	59,70	5,72	72,20	14,20
	C18	0,51	0,49	14,20	20,70	2,42	26,10	2,25
	C20	0,07	0,06	1,62	2,76	0,14	3,04	0,74
	C22	-		2,54	5,07	0,27	4,76	
	C24	-		4,57	7,03	0,65	6,08	
Monounsaturated								
	C16:1	-		1,80	5,00	0,25	6,43	
	C18:1	5,78	4,96	28,30	96,40	4,77	117,00	18,70
	C20:1	0,14	0,11	1,53	3,54	0,21	3,09	0,16
	C22:1	-		1,03	2,56	0,11	2,69	
Polyunsaturated								
	C18:2	23,90	20,10	8,85	20,90	0,47	32,50	3,26
	C18:3	1,97	1,56	1,15	1,96	0,20	2,50	1,92
	C20:4	-		0,78	2,02	0,08	2,49	

Table S5. Mean fatty acid intake expressed in mmol/g mean weight$^{0.75}$.

(m= males, *f*= *females*)

		HP	HF	ST	CF
C10	m	0	1.01	0	0.77
	f	*0*	*1.00*	*0*	*1.03*
C12	m	0.01	8.99	0	4.73
	f	*0.02*	*8.86*	*0*	*6.35*
C14	m	0.03	2.92	0.06	2.30
	f	*0.03*	*2.87*	*0.07*	*3.09*
C16	m	1.19	3.39	1.07	12.6
	f	*1.23*	*3.34*	*1.25*	*15.9*
C18	m	0.16	0.54	0.22	5.15
	f	*0.17*	*0.53*	*0.25*	*6.58*
C20	m	0.17	0.02	0.38	0.59
	f	*0.02*	*0.01*	*0.44*	*0.76*
C22	m	0	0	0.55	0.99
	f	*0*	*0*	*0.64*	*1.26*
C24	m	0	0	0	1.52
	f	*0*	*0*	*0*	*1.96*
C16:1	m	0	0	0	0.99
	f	*0*	*0*	*0*	*1.24*
C18:1	m	1.59	4.51	1.53	18.6
	f	*1.47*	*4.44*	*1.79*	*23.2*
C20:1	m	0.03	0.04	0.34	0.66
	f	*0.04*	*0.04*	*0.39*	*0.84*
C22:1	m	0	0	0	0.49
	f	*0*	*0*	*0*	*0.62*
C18:2	m	5.21	0.71	4.42	5.90
	f	*5.36*	*0.49*	*5.17*	*7.28*
C18:3	*m*	*0.35*	*0.47*	*0.22*	*0.55*
	f	*0.36*	*0.46*	*0.26*	*0.69*
C20:4	*m*	*0*	*0*	*0*	*0.41*
	f	*0*	*0*	*0*	*0.51*
TOTAL	*m*	*8.77*	*21.7*	*8.94*	*56.3*
	f	*8.7*	*21.1*	*10.3*	*71.4*

Table S6. Distribution of C fragments (mol/100 mol) produced in amino acid catabolism

amino acid	path	final energy usable products	1C	2C	3C	4C	5C	Other compounds
Gly	Gly cleavage system → 1C	1C	**50**					
	loss as dipeptides, unused glyoxylate and creatinine							**50**
Ala	transamination → pyr	pyr			**100**			
Ser	Ser dehydratase/ transaminase (and Cys catabolism reuse) → pyr	pyr			**90**			
	hydroxymethyl-transferase → Gly + 1C	1C	**20**					
Cys	desulfhydration → pyr	pyr			**90**			
	oxidation → taurine							**10**
Asp	transamination → OAA	OAA				**100**		
	deamidation (purine nucleotide cycle) → succinate	succinate						
Asn	asparaginase → Asp	OAA				**100**		
Glu	Glu transaminase and/or GluDH → 2KG	2KG					**95**	
	decarboxylation to GABA → succinate					**5**		
Gln	glutaminase → Glu	2KG					**100**	
Pro	oxidase/ dehydrogenase → Glu	2KG					**0,95**	
	losses as unused dipeptides							**5**
Hyp	oxidase/ dehydrogenase → pyr + glyoxylate	pyr + 1C	**85**		**85**			
	losses as unused dipeptides							
Arg	arginase → Orn, eventually → 2KG	2KG					**80**	
	conjugation with Gly → creatine							
	oxidation → Cit, eventually → 2KG via urea cycle	2KG					**10**	
	metabolic losses of (Arg + Orn + Cit)							**10**
Lys	via pipecolate/ saccharopine etc. → AcAc-CoA	AcAc-CoA		**200**				
His	urocanate → Glu → 2KG	2KG					**90**	
	decarboxylation deamination → imidazol acetate → Asp → OAA	OAA				**5**		
	losses as diverse catabolites							**5**
Val	beta-oxidation → succinyl-CoA	succinyl-CoA				**100**		
Leu	beta-oxidation → AcAc + acetyl-CoA	acetyl-CoA + AcAc		**300**				
Ile	beta-oxidation → propionyl-CoA and acetyl-CoA	propionyl-CoA + acetyl-CoA		**100**		**100**		
Thr	dehydratase → amino-acetone, eventually → pyr	pyr			**25**			
	2-ketobutyrate pathway → succiniyl-CoA	succinyl-CoA				**70**		
	aldolase → acetalehyde + Gly	1C + acetate	**5**	**5**				
Met	methyl-transferase → 1C + Hcys, eventually → 2-ketobutyrate → succinyl-CoA	1C + succinyl-CoA	**100**			**100**		
Tyr	oxidation → fumarate + AcAc	fumarate + AcAc		**190**		**95**		**5**
	non-recyclable uses in metabolism							
Phe	oxidation → Tyr, and thus → fumarate + AcAc	fumarate + AcAc		**1,9**		**0,95**		
	excretion of secondary catabolites							
Trp	via kinurenine → Ala + 2-ketoadipate, and then → acetoacetyl-CoA	pyr + AcAc-CoA		**160**	**80**			
	via kinurenate → Asp + 2KG	OAA + 2KG				**5**	**5**	
	via antranylate → 3-ketoadipate → succinyl-CoA + AcAc	succinly-CoA + AcAc		**5**	**5**			
	release of indol + Ala	pyr			**5**			