Table S1 Weight ratio and energy ratio of rodent diets.

	LFD		HFD/ M+HFD	
	Weight ratio g%	**Energy ratio kcal%**	**Weight ratio g%**	**Energy ratio kcal%**
Protein	19.2	20	26	20
Carbohydrate	67.3	70	26	20
Fat	4.3	10	35	60
total:		100		100
kcal/g	3.85		5.24	

Table S2 Feed formulations of rodent diets.

Ingredient	**LFD**		**HFD**		**M+HFD**	
	g/1000 g	**kcal**	**g/1000 g**	**kcal**	**g/1000 g**	**kcal**
Dry mulberry leaf powder	0	0	0	0	200	453.36
Casein	189.58	758.32	258.45	1033.8	212.45	849.8
Cystine	2.84	11.36	3.88	15.52	2.88	11.52
Corn starch	298.59	1194.36	0	0	0	0
Maltodextrin	33.18	132.72	161.53	646.12	121.95	487.8
Saccharose	331.77	1327.08	88.91	355.64	78.91	315.64
Cellulose	47.4	0	64.61	0	0	0
Soybean oil	23.7	213.3	32.31	290.79	32.31	290.79
Lard oil	18.96	170.64	316.6	2849.4	311	2799
Mineral mixture M1002	9.48	0	12.92	0	6.82	0
Calcium hydrophosphate	12.32	0	16.8	0	7.89	0
Calcium carbonate	5.21	0	7.11	0	3.75	0
Potassium citrate	15.64	0	21.32	0	11.41	0
Vitamin mixture V1001	9.48	37.92	12.92	51.68	8.76	35.04
Hydrocholine tartrate	1.9	0	2.58	0	1.87	0
Edible aizen	0	0	0.065	0	0	0
Edible yellow dye	0.047	0	0	0	0	0
Total:	1000	3845.7	1000	5242.95	1000	5242.95

Table S3 Spearman's rank correlation coefficient between body weight gain and other indexes. (N=18)

	Correlation coefficient	P	R^2
BAT/ body weight ratio	-0.484	0.042	0.496
Rectal temperature	-0.73	0.001	0.76
UCP1	-0.28	0.26	0.328
PGC-1α	-0.683	0.002	0.649
PPARγ	-0.548	0.018	0.454
Actinobacteria	-0.052	0.838	0.057
Bacteroidetes	-0.413	0.089	0.441
Cyanobacteria	0.741	0.001	0.588
Deferribacteres	0.152	0.547	0.081
Firmicutes	0.247	0.323	0.327
Proteobacteria	0.334	0.175	0.34
Saccharibacteria	-0.178	0.48	0.088
Tenericutes	-0.162	0.52	0.159
Verrucomicrobia	-0.601	0.008	0.371
Clostridia	0.449	0.062	0.421
Lachnospiraceae	0.385	0.115	0.382
Ruminococcaceae	0.541	0.02	0.447
S24-7	-0.375	0.126	0.416
Porphyromonadaceae	-0.536	0.022	0.428
Prevotellaceae	-0.424	0.08	0.323
Rikenellaceae	-0.59	0.01	0.486
Alphaproteobacteria	0.736	0.001	0.719
Deltaproteobacteria	0.565	0.015	0.431
Arenimonas	0.714	0.001	0.707
Bifidobacterium	-0.344	0.163	0.133