Table S1. Composition of control and high-fat diets.

Ingredients (g per 100 g)	Control (AIN-93M)[a]	High-fat[b]
Milky Casein	14.00	19.86
Maize Starch	47.00	33.59
Dextrinized Starch	15.50	15.50
Sucrose	10.00	6.00
Soy Oil	4.00	3.00
Fibers	5.00	5.00
Animal Fat (lard)	-	6.00
Non-hydrolyzed Vegetable Fat	-	5.00
Sigma Cholic Acid	-	0.50
Cholesterol Sigma	-	1.00
93M mineral mix	3.50	3.50
Vitamin mix	1.00	1.00
L-Cystine	0.18	0.30
Choline Bitartrate	0.25	0.25
T-BHQ[c]	0.08	0.08

[a]Reeves; Nielsen; Fahey (1993). [b]Rhoster – Industry and Trade Ltd. [c]t-BHQ: tert-butylhydroquinone.

Table S2. Samples, NCBI Biosample acession, code and sequences quality filters applied by Trimmomatic (0.36) software

Sequence File ID	NCBI Biosample acession	Code	Average of Raw Data (Each pair)	Quality-filtering
200609105453	SAMN18570499	CTL-1	134028	121163
200609105455	SAMN18570500	CTL-3	116862	104973
200515181656	SAMN18570501	HFD-1	230696	201269
200609105456	SAMN18570600	HDF-2	109064	97333
200609105457	SAMN18570631	HDF-3	142628	127367
200515181657	SAMN18570632	HFD-LC-1	450567	399927
200515181664	SAMN18570656	HFD-LC-2	381000	338604
200515181659	SAMN18570661	HFD-LC-3	112716	100358
200515181660	SAMN18570662	HFD-ILC-1	138942	119844
200515181661	SAMN18570677	HFD-ILC-2	116572	100316
200515181662	SAMN18570678	HFD-ILC-3	197866	171687

Groups: control group (CTL), high-fat diet group (HFD), high-fat diet + *L. casei* (HFD-LC) and high-fat diet + ultrasound-inactivated *L. casei* (HFD-ILC).

Table S3. Permanova statistical analysis from beta-diversity data using Adonis script in QIIME.

	Df	SumsOfSqs	MeanSqs	F.Model	R2	Pr(>F)
qiime.data$map[[opts$category]]	3	1.1809	0.39365	1.7739	0.4319	0.003 **
Residuals	7	1.5534	0.22191		0.5681	
Total	10	2.7343			1.0000	

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Table S4. Relative abundance of bacterial family inferred from 16S rRNA gene sequencing analysis in fecal samples of rats fed standard diet and rats fed high-fat diet receiving or not live and ultrasound-inactivated *Lacticaseibacillus casei*.

Family	CTL	HFD	HFD-LC	HFD-ILC
Lachnospiraceae	33.5 ± 17.0 [d]	77.5 ± 10.6[c]	95.2 ± 2.4 [a]	91.3 ± 4.0 [bc]
Ruminococcaceae	47.0 ± 20.2 [a]	2.8 ± 1.7 [b]	1.3 ± 1.0 [b]	3.2 ± 3.0 [b]
Christensenellaceae	2.8 ± 2.3 [a]	7.8 ± 12.9 [a]	1.0 ± 1.0 [a]	0.7 ± 1.2 [a]
Erysipelotrichaceae	5.7 ± 3.9 [a]	3.0 ± 2.6 [ab]	0.5 ± 0.2 [b]	1.2 ± 0.3 [ab]
Clostridiales; Family XIII	0.9 ± 0.4 [a]	1.6 ± 1.7 [a]	0.6 ± 0.5 [a]	0.6 ± 0.3 [a]
Clostridiaceae 1	0.0 ± 0.0 [c]	2.3 ± 1.0 [a]	0.4 ± 0.1 [b]	1.1 ± 0.9 [b]
Peptostreptococcaceae	0.0 ± 0.0 [c]	0.6 ± 0.4 [a]	0.2 ± 0.1 [bc]	0.2 ± 0.2 [ab]
Coriobacteriaceae	0.6 ± 0.4 [a]	0.8 ± 0.8 [a]	0.2 ± 0.2 [a]	0.3 ± 0.1 [a]
Clostridiales;Other	0.1 ± 0.1 [a]	0.1 ± 0.1 [a]	0.1 ± 0.1 [a]	0.1 ± 0.1 [a]
Enterobacteriaceae	0.0 ± 0.0 [b]	1.3 ± 2.1 [a]	0.1 ± 0.0 [a]	0.1 ± 0.1 [a]
Methanobacteriaceae	1.8 ± 1.6 [a]	0.0 ± 0.0 [b]	0.0 ± 0.0 [b]	0.0 ± 0.0 [b]
Muribaculaceae	3.0 ± 0.4 [a]	0.0 ± 0.0 [b]	0.0 ± 0.0 [b]	0.0 ± 0.1 [b]
Prevotellaceae	0.4 ± 0.2 [a]	0.0 ± 0.0 [b]	0.0 ± 0.0 [b]	0.0 ± 0.1 [b]
Helicobacteraceae	0.2 ± 0.0 [a]	0.8 ± 1.2 [a]	0.0 ± 0.0 [b]	0.0 ± 0.0 [b]

*Average ± SD. Different letters in the same line means significant difference ($p < 0.05$) among treatments by Kruskal-wallis test. Treatments: control group (CTL), high fat diet group (HFD), high fat diet + *L. casei* (HFD-LC) and high fat diet + ultrasound-inactivated *L. casei* (HFD-ILC).