

Supplementary material

Table S1. Dietary energy distribution of the normal-fat diet (NFD, #D12450B) and high-fat diet (HFD, #D12451) purchased from Research Diets Co. Ltd. (New Brunswick, NJ, USA).

Nutritional Components	Normal-fat diet (10% dietary fat)	High-fat diet (45% dietary fat)
Protein	20	20
Carbohydrate	70	35
Fat	10	45
Total kcal/g	100	100

Table S2. Composition of the normal-fat diet (NFD, #D12450B) and high-fat diet (HFD, #D12451) used in the animal experiment.

Ingredients	Normal-fat diet (10% dietary fat)		High-fat diet (45% dietary fat)	
	g	kcal	g	kcal
Casein, 30 mesh	200	800	200	800
L-cystine	3	12	3	12
Corn starch	315	1260	72.8	291
Maltodextrin 10	35	140	100	400
Sucrose	350	1400	172.8	691
Cellulose, BW200	50	0	50	0
Soybean oil	25	225	25	225
Lard	20	180	177.5	1598
Mineral mix S10026	10	0	10	0
Dicalcium phosphate	13	0	13	0
Calcium carbonate	5.5	0	5.5	0
Potassium citrate	16.5	0	16.5	0
Vitamin mix V10001	10	40	10	40
Choline bitartrate	2	0	2	0
FD&C yellow dye	0.05	0	-	-
FD&C red dye	-	-	0.05	0

Table S3. The nutrients, non-nutrients composition in *Laminaria japonica* medium (3%) before and after *Lactobacillus brevis* FZU0713 fermentation

Composition	Content (unit per 100 mL medium)	
	Before fermentation	After fermentation
Protein	0.246 g	1.32 g
Carbohydrate	1.752 g	1.340 g
Lipids	0.015 g	0.036 g
Total dietary fiber	0.336 g	0.108 g
Vitamin A	0.12 mg	0.08 mg
Vitamin E	0.026 mg	0.018 mg
Total carotenoids	0.017 mg	0.023 mg
K	5.34 mg	1.80 mg
Na	8.59 mg	6.60 mg
Ca	3.0 mg	0.6 mg
Mg	4.56 mg	2.56 mg
Se	0.17 µg	0.08 µg
P	7.38 mg	5.38 mg
I	1.08 mg	0.76 mg
Lactic acid	-	0.680 g
Acetic acid	-	0.142 g
Propionic acid	-	0.024 g
Butyric acid	-	0.020 g