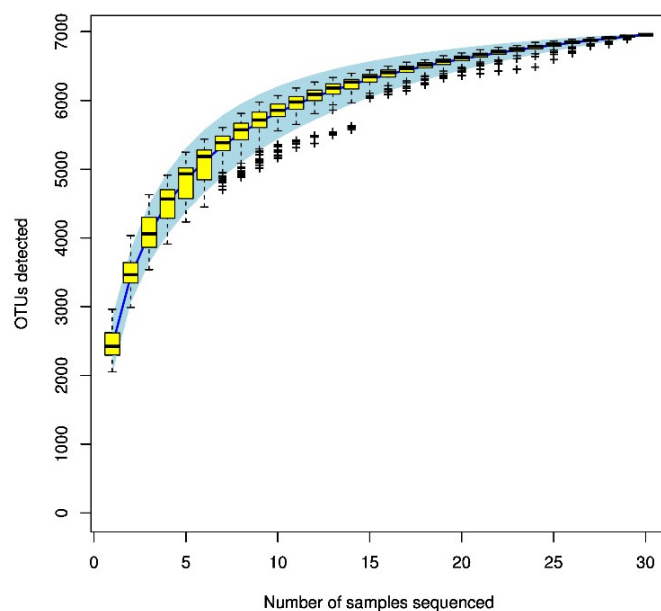
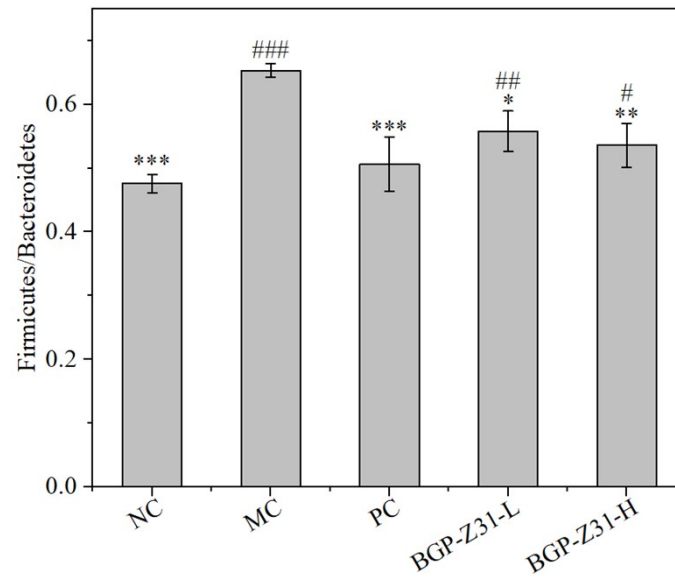


**Supplementary Material:**

**Figure S1.** Specaccum species accumulation curve.



**Figure S2.** Effects of BGP-Z31 on the ratio of *Firmicutes/Bacteroidetes*. Data are expressed as mean  $\pm$  SD ( $n=6$ ). #  $P < 0.05$ , ##  $P < 0.01$ , ###  $P < 0.001$  relative to NC group; \*  $P < 0.05$ , \*\*  $P < 0.01$ , \*\*\*  $P < 0.001$  relative to MC group.



**Table S1.** Raw material compositions of mice feed.

Raw material	Normal control diet (g)	High-fat diet (g)
Casein	200	200
L-cystine	3	3
Corn starch	504	0
Fructose	0	200
Maltodextrin	100	100
Sucrose	100	100
Cellulose	50	50
Soybean oil	25	25
Lard oil	20	155
Mixed minerals S10026B	50	50
Vitamin mix V10001C	1	1
Choline bitartrate	2	2
Cholesterol	0	18
Total	1055	904

**Table S2.** Alpha diversity index of mice in different treatment groups.

Groups	Chao1	Shannon	Observed-species
NC	2914.57±147.62	6.75±0.24**	2313.88±106.48
MC	3054.93±254.48	7.38±0.27##	2388.43±216.45
PC	3004.80±154.46	6.90±0.31*	2345.10±157.95
BGP-Z31-L	3002.36±121.46	7.05±0.40	2384.27±146.24
BGP-Z31-H	3030.84±294.57	7.12±0.52	2391.22±282.57

Note: #  $P < 0.05$ , ##  $P < 0.01$  relative to NC group; \*  $P < 0.05$ , \*\*  $P < 0.01$  relative to MC group.