Electronic Supplementary Material (ESI) for Food & Function.

Supplementary materials

1. Results

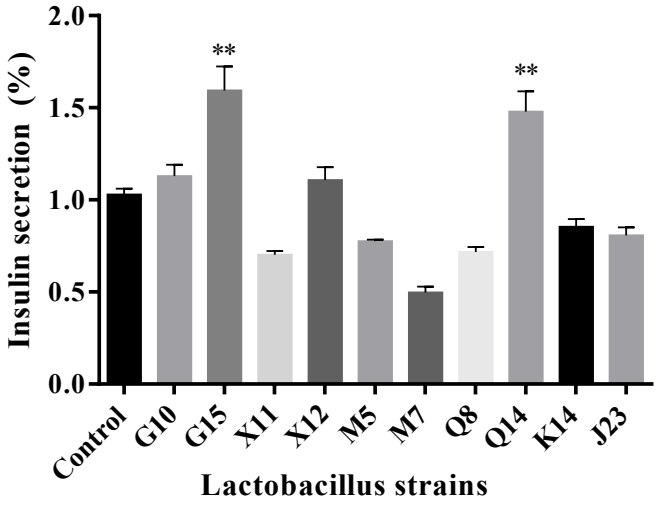

Fig. 1 Glucose-stimulated insulin secretion after treated with different lactobacillus. (**P<0.01 compared with the Control). *Lactobacillus* G15 and Q14 significantly improved the insulin secretion of glucose-stimulated INS-1 cells. We assumed that the strains had a hypoglycemic potential.

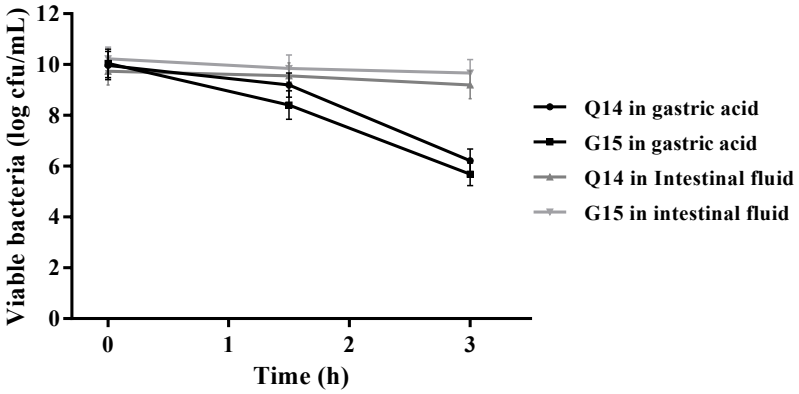

Fig. 2 Tolerance to gastric acid and intestinal fluid of *Lactobacillus* G15 and Q14. The survival of bacteria cells in gastric acid and intestinal fluid in vitro predicted the actual in vivo survival of the strains when consumed in a non-protected way.

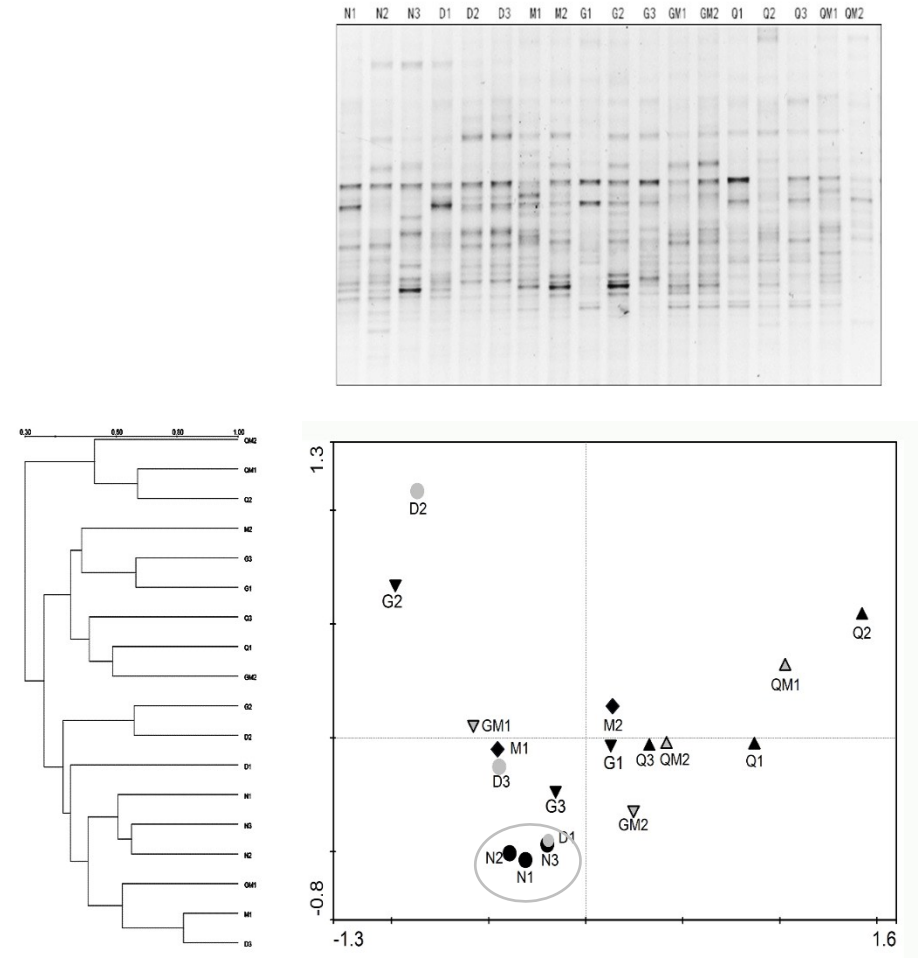

Fig. 3 HFD induced the gut microbiota disturbance. Stool samples were randomly collected in week 6 (after HFD manipulation and before treatment) for baseline, to evaluate the regulation of gut microbiota by different treatments. HFD resulted in disorganized gut microbiota in contrast with the N group.

2. Material and methods

2.1 The glucose-stimulated insulin secretion (GSIS) test

In brief, we chose 10 lactobacillus strains isolated from traditional food by our lab previously, after grown anaerobically in MRS medium at 37°C for 18-36 h, the bacteria were collected by centrifugation and washed twice with phosphate-buffered saline (PBS). The cells were counted and suspended in PBS at 10^9 cfu·mL^{-1}. Then the bacteria cells were sonicated for 15 min at 120 kW and centrifuged at 2000 g for 10 min. Supernatants containing crude cell wall extracts were sterilized using 0.45 μm filter and kept at -20°C. [1]

To assay insulin secretion, INS-1 cells (insulin secreting cell line, provided by the Cancer Institute of the Chinese Academy of Medical Science, Beijing, China) were seeded at 3.5×10^5 cells/well in 12-well tissue culture dishes. After 72 h of pre-incubation in RPMI-1640 medium with bacteria cell-free extract (15 %), the cells were washed with PBS twice. Insulin secretion was measured after a static incubation for 2 h in 2mL RPMI-1640 medium containing glucose (16.7 mmol/L), insulin released into

the supernatants was measured using an ELISA kit (Jiancheng Bioengineering Institute, Nanjing, China).

2.2 The gastric acid and intestinal fluid tolerance test

Briefly, bacteria cells from overnight (18 h) lactobacillus cultures were harvested (10 000 g, 5 min) and re-suspended in PBS solution, pH 2.0, containing 3 $mg \cdot mL^{-1}$ pepsin (Sigma Chemical Co., MO, USA), and in PBS solution, pH 8.0, containing 1 $mg \cdot mL^{-1}$ pancreatin and 0.45% bile salts (Sigma Chemical Co., MO, USA). Initial populations ranged from 9.7 to 10.2 log $cfu \cdot mL^{-1}$. Resistance was assessed in terms of viable colony counts and enumerated after incubation at 37°C for 0, 1.5 and 3 h, which reflecting the time spent of food in the stomach and small intestine.[2]

Reference

1. S. H. Kim, C. S. Huh, I. D. Choi, J. W. Jeong, H. K. Ku, J. H. Ra, T. Y. Kim, G. B. Kim, J. H. Sim and Y. T. Ahn, Journal of applied microbiology, 2014, 117, 834-845.
2. P. A. Maragkoudakis, G. Zoumpopoulou, C. Miaris, G. Kalantzopoulos, B. Pot and E. Tsakalidou, International Dairy Journal, 2006, 16, 189-199.