Table S1. Composition of mouse diet (Diet 86)

Ingredient	Concentration (% w/w)
Wheat	40.00
Broll	21.50
Barley	20.00
Meat & bone meal	6.00
Fish meal	5.00
Mollases	2.50
Prelac	2.00
Dried blood meal	1.70
Sodium chloride	0.50
Tallow	0.45
Limestone	0.2
Premix	0.15

Supplementary Materials and Methods

Chemical analysis of exopolysaccharide

The total carbohydrate and fructose contents of the exopolysaccharide were determined colorimetrically by the phenol-sulphuric acid method (Dubois *et al*., 1956) and the ketose-specific modification of the anthrone method (Pollock and Jones, 1979), respectively, using fructose as a standard.

For fructanase treatment, exopolysaccharide (70 mg) was dissolved in 0.1 M sodium acetate (pH4.5) at 2 mg per ml and incubated with fructanase (~3000 units; Megazyme) at 40°C for 20 h. The reaction was stopped by boiling for 5 minutes, the sample centrifuged (3,000 x *g*, 15 minutes, room temperature), and the soluble material was dialysed against distilled water (molecular weight cut-off 12,000), then lyophilised.

For molecular weight analysis, exopolysaccharide and fructanase-treated exopolysaccharide was separated by size-exclusion HPLC (SEC) on three columns (TSK-Gel G5000PWXL, G4000PWXL and G3000PWXL, 300 x 7.8 mm, Tosoh Corp., Tokyo, Japan) connected in series. Samples (500μg) dissolved in distilled water (10 mg per ml) were eluted with water (0.5 ml per minute) and detected with a Waters 490E UV detector set at 280 nm, a DAWN-EOS multi-angle laser light scattering (MALLS) detector with a laser at 690 nm (Wyatt Technology Corp., Santa Barbara, CA, USA) and a Waters 2410 refractive index monitor. The molecular weight of the eluted material was estimated by comparison of peak elution positions with

pullulan standards (5.8 – 850 kDa) and by MALLS using ASTRA software (Version 4.73.04, Wyatt Technology Corp.) using a *dn/dc* of 0.143 ml per gram .

Exopolysaccharide (100 μg) was separated by high performance anion-exchange chromatography (HPAEC) on a CarboPac PA-100 (4 x 250 mm) column using Dionex ICS 3000 (Dionex Corp., Sunnyvale, CA, USA) with 100 mM sodium hydroxide as eluant using a gradient of sodium acetate (Cairns *et al*., 1999).

To determine the linkages between the glycosyl residues, exopolysaccharide (~200 μg) was derivatised as described by Bonnett *et al*. (1994). Samples dissolved in dimethylsulfoxide were methylated using NaOH and CH_3I. After extraction into chloroform, the methylated polysaccharides were hydrolysed with TFA, reduced and acetylated. The resulting partially methylated alditol acetates were separated by GC (HP5-MS, 30 m x 0.25 mm i.d., 0.25 μm film thickness, Agilent) with the GC oven programmed from 50°C (1 min) to 130°C at a rate of 25°C per minute, and then to 230°C at a rate of 3°C per minute and analysed by MS using a Hewlett Packard 5973 MSD. Identifications were based on peak retention times and by comparison of electron impact mass spectra with published spectra.

For NMR spectroscopy, ^{1}H and ^{13}C NMR spectra were recorded on a Bruker 500 MHz spectrometer at 30°C. Samples were dissolved in deuterium oxide (99.6 atom%), and transferred to 5 mm o.d. NMR tubes. Assignments were made from double quantum filtered (DQF) COSY, heteronuclear single quantum coherence (HSQC) COSY and HSQC TOCSY experiments and by comparing the spectra with data in public databases.

Analysis of mouse stomach contents

Sucrose concentrations in stomach contents were measured as follows. Four batches of pooled stomach contents from *Lactobacillus*-free mice (13 mice) and four batches of pooled stomach contents from mice colonised with strain 100-23 (13mice) were homogenised in sterile water, centrifuged at low speed (106 x *g*) to remove particulate material, then lyophilized. Soluble sugars were extracted from the lyophilized material after extraction in methanol (62.5 % v/v) at 55°C for 1 h with vortexing. Extracts were centrifuged to remove particulates, and the supernatants were analysed by HPLC (Dionex Ultimate 3000). Aliquots (20 µl) were separated by HPLC on a Prevail carbohydrate ES 5µ column (250 x 4.6 mm; Grade Davidson Discovery Science), in a solvent mix of 25% water and 75% acetonitrile at a flow rate of 1 ml per min. The column temperature was kept at 30°C. Peaks were detected using an ELSD (Polymer Laboratories, Alphatech Systems Ltd, gas flow 1.0, nebulising temperature 40°C, evaporating temperature 90°C), and identified by their retention times against standards (fructose (BDH) 7.8 min, glucose (BDH) 10.4 min, sucrose (Merck) 14.7 min, maltose (BDH) 18.0 min). The area under the peaks was integrated using Millennium (software version 3.2, Waters Corporation) and quantified against standard curves produced during the analysis.

To detect exopolysaccharide in stomach contents, the pooled stomach contents (prepared as above) of 19 mice colonised with strain 100-23 and pooled stomach contents from 20 *Lactobacillus*-free mice were dissolved in water and dialysed exhaustively against distilled water (molecular weight cut-off 1000 Da) and lyophilised to yield 16 mg and 7 mg dried material from colonised and control mice,

71 respectively. These were dissolved at 1 mg per ml and analysed by HPAEC as
72 described above.

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Figure S1. A, molecular weight analysis of *L. reuteri* exopolysaccharide by size-exclusion chromatography on three columns (TSK-Gel 5000_{PWXL}, 4000_{PWXL}, 3000_{PWXL}) connected in series. Arrows indicate the elution volumes of pullulan molecular weight standards. **B-D**, high-performance anion-exchange chromatography of chicory inulin (B), *L. reuteri* exopolysaccharide (C), and stomach contents of mice colonised with *L. reuteri* 100-23 (D). The oligosaccharides were separated on a CarboPac PA-100 column, eluted with a gradient of NaOAc and monitored by pulsed amperometric detection. **E and F**, proton (E) and ^{13}C (F) NMR of *L. reuteri* exopolysaccharide in D_2O at 500 MHz.