

Supplementary Information

Supplemental Tables

Table S1. The intracellular and extracellular trehalose content of *L. fermentum* FXJCJ6-1 grown under hypo- and hypertonic conditions.

Conditions	Extracellular trehalose content (g/L)	Intracellular trehalose content (g/L)
hypotonic	2.00 ± 0.01	-
hypertonic	1.89 ± 0.04	-

Note: ‘-’ means not detected.

Table S2. The intracellular lactose content of *L. brevis* 173-1-2 grown under hypo- and hypertonic conditions.

Conditions	Intracellular lactose content (g/L)
hypotonic	-
hypertonic	-

Note: ‘-’ means not detected.

Supplemental Figures

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Query 1  MMSKINQTDIDRLIELVGGGRNIATVSHCITRLRFVLNQANARPKEIEQLPMVKGCFN 60
          M K TD+ + I G NI +HC TRLR VL K ++ VKG F
Sbjct 1  MDHKQVATDVIKAI-----GADNIVAAAHCAITRLRLVLKDDEAIDQKALDNDGVKGTFT 56

Query 61  AGQFQVVIGT-NVGDDYYQALIASTGQAQVDKEQVKAARHNMKWHE--QLISHFAVIFFP 117
          GQ+QV+IG +V + Y LI TG +V E +K+ N K++ I + IF P
Sbjct 57  NGQYQVVIIGPGDVNNVYDELIKQTGLKEVSTEDLKQIVAKNQKFNPMVMAFIKLLSDIFVP 116

Query 118  LLPALISGGLILGFRNVIGDLPMSNGQTLAQMYPSTIYDFLWLIGEAIFFYLPVGCW 177
          ++PAL++GGL++ NV+ + +++ QM+P+++ + + ++ A + +LP+ +
Sbjct 117  IIPALVAGGLLMALDNVLSQGLFGPKSVVQMFPKLEGMVNVMSAAPYVFLPILVGV 176

Query 178  SAVKKMGGTPILGIVLGVTLVSPQLMNAYLLGQQLPEVWDFGMFSIAKVGYYAQVIPALL 237
          S K+ G LG V+G+ + +P L W F++ Y QVIPAL
Sbjct 177  SGAKRFGANQFLGAVVGMMTAPVLAEG-----GAWHLFGFTVNIQSYTGQVIPALA 228

Query 238  AGLALGVIETRLKRIVPDYLYLVVVPVCSLILAVFLAHLIGPFGRMIGDVAFVAVRHL 297
          A L + E + +P + P+ S+IL F+ ++GP + + D + + L
Sbjct 229  AVWLISIFEKWFHKKLPSAVDFTFTPLLSVILTGFITFIVVGPVMEKLSDLITNGIVWLY 288

Query 298  TGSFAPIGAALFGFLYAPLVITGVHQTTLAIDLQMIQSMG-----GTPVWPLIALSNIAQ 352
          + + +G +FG +Y+P+V+TG+HQ+ AI+ Q++ + G ++ + ++N+AQ
Sbjct 289  S-TLGFVGTGIFGAIYSPIVLTGLHQSPAIETQLVTAYKSGTGYGDFIFVVASMANVAQ 347

Query 353  GSAVIGIISSRKHNREISVPAAISAWLGVTEPAMYGNLKYRFPMLCAMILGSLAGLL 412
          G+A + ++ + +S AA+SA LG+TEPA++G+NLK +P CA+IGS A L
Sbjct 348  GAATTAVYFLTKNEKMKGLSSSAVSAALLGITPALFGVNLKLFPPFCALIGSATAATL 407

Query 413  CGLNGVMANGIGVGGLPGILSIQPSYWQVFALAMAIAIIPIVLTSTFIYQRKYR 466
          GL V+A +G G G LSI + L ++ ++ +T F+Y + +
Sbjct 408  AGLFHVIAVSMGSAGFIGFLSIGAKSIPFYLLCELVSFVVAFTIT-FLYGKTHN 460

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Figure S1. Results of amino acid sequence comparison between PTS-II-sucr in *L. fermentum*

FXJCJ6-1 and treB.

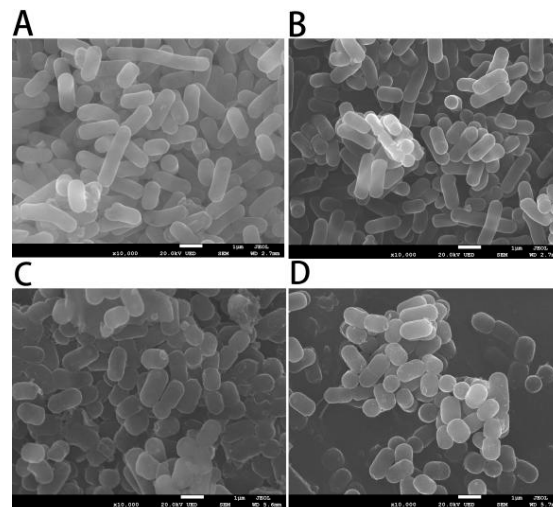


Figure S2. Scanning electron micrographs of the morphology of heterofermentive *Lactobacillus*

fermented with different carbohydrates. (A, B-) The bacterial morphology of *L. fermentum*

FXJCJ6-1 fermented with glucose and lactose; (C, D)-Bacterial morphology of *L. reuteri*

CCFM1040 fermented with glucose and lactose.