

Application of fructans-degrading *Lachancea fermentati* FST5.1 as an alternative to baker's yeast in the production of a low-FODMAP whole wheat bread.

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FODMAPs are a group of poorly absorbed dietary carbohydrates comprised of easily fermentable oligo-, di-, monosaccharides and polyols. When consumed, they can exert gastrointestinal symptoms of pain, flatulence, or an irregular bowel movement in individuals with irritable bowel syndrome. Whole wheat bread is an excellent source of proteins, vitamins, polyphenols, and other nutrients, but its consumption is restricted in a low-FODMAP diet due to high fructans content. Although alternatives exist, these are primarily gluten-free, often inferior in terms of quality, nutritional profile, and consumer acceptance. Bioprocessing using microbial fermentation has a proven capacity to reduce FODMAPs in cereal products, but careful selection of fermentative strain is required. Screening of 96 yeast strains in agar and microtitre assays based on Wickerhams basal medium supplemented with 0.5% (w/v) sucrose, fructose, lactose, mannitol, raffinose, fructooligosaccharides and inulin showed variable FODMAPs utilisation profiles in yeast. Two non-*Saccharomyces* strains with extensive FODMAP-degrading ability: *Lachancea fermentati* FST5.1 and *Cyberlindnera fabianii* NTCyb, alongside baker's yeast (*Saccharomyces cerevisiae*), were used in whole wheat bread baking trial. While *C. fabianii* NTCyb could not significantly reduce FODMAPs in a complex whole wheat-dough matrix, *L. fermentati* FST5.1 could. Furthermore, the latter strain's reduction of fructans, the most abundant FODMAPs in wheat, was more efficient than the commercial baker's yeast. Quality analysis revealed similar processing and quality parameters of bread produced with *L. fermentati* FST5.1 and baker's yeast. Ultimately, the *L. fermentati* FST 5.1 can be proposed as an excellent alternative to *S. cerevisiae* for low-FODMAP bread production.

References:

Ispiryan, L., Borowska, M., Sahin, A.W., Zannini, E., Coffey, A., and Arendt, E.K., 2021. *Lachancea fermentati* FST 5.1: an alternative to baker's yeast to produce low FODMAP whole wheat bread. Food & function, 12(22), pp.11262-11277.