

**PENGARUH PENGGUNAAN *Rhizopus oryzae* AT3  
DALAM FERMENTASI SINGKONG SAWUT (*Manihot esculenta*)  
TERHADAP NILAI BAKING EXPANSION TEPUNG**

**INTISARI**

Tepung singkong dikenal memiliki kemampuan mengembang (*baking expansion*) yang rendah. Modifikasi tepung singkong melalui fermentasi asam laktat merupakan salah satu usaha meningkatkan *baking expansion*. Tujuan penelitian ini yaitu mengevaluasi penggunaan starter *Rhizopus oryzae* AT3 dalam usaha meningkatkan *baking expansion* tepung singkong melalui fermentasi singkong sawut. Pada penelitian ini selain fermentasi menggunakan starter *R.oryzae* AT 3 (FJ), juga dibandingkan dengan fermentasi menggunakan *Lactobacillus plantarum* UA3 (FB) dan campuran starter *R. oryzae* AT3 dan *L. plantarum* UA3 (FC) serta fermentasi tanpa penambahan starter (FS). Selama fermentasi dilakukan pengamatan populasi bakteri, aktivitas metabolisme jamur, pH, dan persentase total asam tertitrasi. Pada akhir fermentasi, singkong sawut terfermentasi dikeringkan dengan oven kemudian diukur *baking expansion* dan kadar asam laktat dengan HPLC.

Hasil penelitian menunjukkan bahwa penambahan starter *R.oryzae* AT3 tidak mempengaruhi populasi bakteri yang secara alami terdapat dalam substrat. Penggunaan starter jamur (FJ dan FC) mampu meningkatkan jumlah total asam tertitrasi hingga lebih dari 1%. Kromatogram tepung singkong hasil fermentasi menunjukkan kandungan asam laktat pada semua perlakuan. Tepung singkong hasil fermentasi menggunakan *R.oryzae* AT3 (FJ dan FC) mengandung asam-asam organik yang tidak dapat teridentifikasi. Kadar asam laktat hasil fermentasi menggunakan *R.oryzae* AT 3 (FJ) merupakan yang terendah (0,68%) dibanding 3 perlakuan lain (FC: 2,15%; FB: 2,09%; FS: 0,99%). *Baking expansion* menghasilkan nilai terbesar pada perlakuan FB (2,51 ml/g ) kemudian diikuti FS (2,12 ml/g),FC (2,04 ml/g) dan terakhir FJ (1,68 ml/g). Hasil ini menunjukkan bahwa penggunaan *R.oryzae* AT3 belum berhasil meningkatkan *baking expansion* tepung singkong.

Kata kunci: Singkong, fermentasi asam laktat, *Lactobacillus plantarum* UA3, *Rhizopus oryzae* AT3, asam laktat, *baking expansion*

## EFFECT OF FERMENTING SHREDDED CASSAVA (*Manihot esculenta*) USING *Rhizopus oryzae* AT3 ON BAKING EXPANSION OF FLOUR

### ABSTRACT

Cassava flour is known to have low baking expansion. Modification of cassava flour through lactic acid fermentation is one effort to increase baking expansion. The aim of this study was to evaluate the use of starter *Rhizopus oryzae* AT3 (FJ) in increasing cassava flour baking expansion by fermenting shredded cassava. In this study was also compared with fermentation using starter of *Lactobacillus plantarum* UA3 (FB), mixed starter of *R. oryzae* AT3 and *L. plantarum* UA3 (FC) and without starter (FS). During fermentation, sample was taken daily for analyzing of populations of bacteria, fungal metabolic activity, pH, and total titratable acidity. At the end of fermentation, fermented shredded cassava dried in oven and then measured baking expansion and lactic acid levels by HPLC.

The results showed that the addition of starter *R.oryzae* AT3 not affected the population of bacteria that were naturally present in the substrate. The use of fungal starter (FJ and FC) could increased the total amount of titratable acidity up more than 1%. Fermented cassava flour chromatogram showed the lactic acid content in all treatments. Fermented cassava flour using *R.oryzae* AT3 (FJ and FC) contained organic acids that could not be identified. Levels of lactic acid of FJ was the lowest (0.68%) than the other three treatments (FC: 2.15%; FB: 2.09%; FS: 0.99%). Baking expansion produced the greatest value in the treatment of FB (2.51 ml / g) followed by FS (2.12 ml / g), FC (2.04 ml / g) and the last FJ (1.68 ml / g). These results indicated that the use of *R.oryzae* AT3 had not succeeded in improving cassava flour baking expansion.

Keywords: Cassava, lactic acid fermentation, *Lactobacillus plantarum* UA3, *Rhizopus oryzae* AT3, lactic acid, baking expansion