

ABSTRACT

EFFECT OF VARIOUS TYPES OF STARTER CULTURES LACTIC ACID BACTERIA AND FERMENTATION TIME TO THE FUNCTIONAL CHARACTERISTIC OF YELLOW SWEET POTATO FLOUR

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The aims of this study were to determine the effect of starter culture addition, and the length of fermentation, as well as the interaction between the two treatments on the functional characteristics of yellow sweet potato flour. The study was arranged in a Complete Randomized Block Design (CRBD), factorial with two factors and three replications. The first factor was the starter culture of lactic acid bacteria, namely: the starter from spontaneous fermentation, pickle brine, and *Leuconostoc mesenteroides*. The second factor was the length of fermentation consisted of 0 hours, 24 hours, 48 hours, 72 hours. Data of functional properties were analyzed by using ANOVA and further tested by orthogonal polynomial-contrast test at 1% level. While the data of starch granules are discussed descriptively. The results showed that all treatments (starter culture and length of fermentation) significantly affected the functional characteristics of yellow sweet potato flour, and there were interactions on parameter of pH, starch yield, water retention, and expansion rate. During fermentation (0-72 hours) there was a linear decrease in pH, starch yield, color and aroma score, but there was an increase in

swelling power and water retention. The rate of decrease and increase varies depending on the type of starter culture. In the parameter of solubility there was a quadratic reduction pattern with a minimum point for the treatment of pickle brine 9.59%, *Leuconostoc mesenteroides* 10.85% and spontaneously 11.41%, while in the parameter of expansion rate occurred a quadratic increase pattern with the maximum point for pickle brine, *Leuconostoc mesenteroides* and spontaneously were 16.89; 16.54 and 16.30. On the starch granule appearance, for all starter culture treatments, the longer the fermentation, the more damaged granular surface.

Keywords : Lactic acid bacteria, *Leuconostoc mesenteroides*, functional properties, spontaneous fermentation, yellow sweet potato, flour, pickle brine

ABSTRAK

PENGARUH BERBAGAI JENIS KULTUR STARTER BAKTERI ASAM LAKTAT DAN LAMA FERMENTASI TERHADAP KARAKTERISTIK FUNGSIONAL TEPUNG UBI JALAR KUNING

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Penelitian ini bertujuan untuk mengetahui pengaruh penambahan kultur starter, dan lama fermentasi, serta interaksi antara keduanya terhadap karakteristik fungsional tepung ubi jalar kuning. Penelitian disusun dalam Rancangan Acak Kelompok Lengkap (RAKL), faktorial dengan dua faktor dan tiga kali ulangan. Faktor pertama adalah kultur starter bakteri asam laktat yaitu: kultur starter dari fermentasi spontan, cairan pikel dan *Leuconostoc mesenteroides*. Faktor kedua adalah lama fermentasi yaitu: 0 jam, 24 jam, 48 jam, 72 jam. Data sifat fungsional dianalisis dengan sidik ragam serta diuji lanjut dengan uji ortogonal polinomial-contras pada taraf 1 %. Sedangkan data granula pati dibahas secara deskriptif. Hasil penelitian menunjukkan bahwa seluruh perlakuan (jenis kultur stater dan lama fermentasi) berpengaruh nyata terhadap karakteristik fungsional tepung ubi jalar kuning, dan terdapat interaksi pada parameter pH, rendemen pati, *water retention*, dan *expansion rate*. Selama fermentasi (0-72 jam) terjadi penurunan secara linier pada pH, rendemen pati, skor warna dan aroma, namun terjadi peningkatan pada *swelling power* dan *water retention*. Laju penurunan dan

peningkatan berbeda-beda tergantung jenis kultur starter. Pada parameter *solubility* terjadi pola penurunan secara kuadratik dengan titik minimum untuk perlakuan cairan pikel 9,59%, *Leuconostoc mesenteroides* 10,85% dan spontan 11,41%, sedangkan pada *expansion rate* terjadi pola peningkatan secara kuadratik dengan titik maksimum untuk cairan pikel, *Leuconostoc mesenteroides* dan spontan berturut-turut adalah 16,89; 16,54 dan 16,30. Pada penampakan granula pati, untuk semua perlakuan kultur starter, semakin lama fermentasi semakin banyak permukaan granula yang mengalami kerusakan.

Kata Kunci : Fermentasi, tepung, ubi jalar kuning, *Leuconostoc mesenteroides*, pikel, bakteri asam laktat, *swelling power*, *solubility*