

Pengaruh penambahan enzim transglutaminase terhadap jumlah bakteri asam laktat serta sifat fisik dan kimia produk minuman yogurt = Effect of transglutaminase addition to total of lactic acid bacteria and physical and chemical properties of yogurt product

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Abstrak

ABSTRACT

Penelitian ini menyelidiki pengaruh penambahan enzim transglutaminase terhadap jumlah bakteri asam laktat serta sifat fisik dan kimia produk minuman yogurt dengan memvariasikan konsentrasi transglutaminase 0; 0,1; 1; 2 UE/gram protein susu serta periode penyimpanan 1, 8, 15 hari penyimpanan. Transglutaminase juga ditambahkan pada dua tahap berbeda, yaitu sebelum fermentasi dengan tahap inaktivasi enzim sebelum ditambahkan kultur bakteri asam laktat dan bersamaan dengan penambahan kultur bakteri asam laktat tanpa proses inaktivasi enzim. Tidak ada perbedaan yang signifikan dalam waktu fermentasi, tetapi konduktivitas sampel tanpa penambahan transglutaminase meningkat lebih cepat dibanding sampel dengan penambahan transglutaminase. Penambahan transglutaminase juga menyebabkan penurunan pH yang semakin melambat serta penurunan jumlah bakteri asam laktat dalam sampel selama periode penyimpanan. Selain itu, transglutaminase menyebabkan sineresis sampel berkurang dan viskositas meningkat, namun tidak menimbulkan perubahan yang berarti terhadap kadar nutrisi dan karakteristik sensori. Struktur yogurt menjadi lebih padat dan kompak akibat terjadinya ikatan silang antar kasein yang juga menyebabkan berat molekulnya meningkat. Semakin tinggi konsentrasi, efek transglutaminase semakin meningkat. Pada sampel dengan penambahan transglutaminase bersamaan dengan penambahan kultur bakteri, transglutaminase terus bekerja selama periode penyimpanan. Dari penelitian ini, dapat disimpulkan bahwa transglutaminase dapat secara efektif digunakan untuk meningkatkan kualitas yogurt.

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ABSTRACT

This study was conducted to investigate the effect of transglutaminase addition to total of lactic acid bacteria and physical and chemical properties of yogurt product by varying enzyme concentration 0 0,5 1 2 UE gram milk protein and storage period 1, 8, 15 days storage period. The addition of transglutaminase was conducted at different production steps prior to fermentation with enzyme inactivation process and together with starter culture addition without inactivation process. There was no significant difference in fermentation time, but the conductivity of the sample without transglutaminase addition was increasing faster than other samples. Transglutaminase was resulting in slower acidity development during storage period, decreased syneresis and increased viscosity, but had no significant effect on nutritional value and sensory characteristic of the samples. The structure of yogurt became more compact and denser and molecular weight of casein is increasing. It was also shown that the higher the concentration of transglutaminase added into sample, the effect of transglutaminase activity was getting more reflected in the samples, especially samples without inactivation process that had the enzyme to be active during storage time. From this study, it can be concluded that transglutaminase can be effectively used in yogurt production to increase its quality.