

## SCREENING BEBERAPA STRAIN BAKTERI ASAM LAKTAT DALAM PRODUKSI GAMMA AMINOBUTYRIC ACID PADA PROSES FERMENTASI SUSU

### INTISARI

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*Gamma aminobutyric acid* (GABA) merupakan asam amino non protein yang diproduksi melalui dekarboksilasi glutamat oleh enzim glutamat dekarboksilase yang disintesis oleh bakteri asam laktat (BAL) sebagai kultur starter fermentasi susu. Penelitian ini bertujuan untuk memperoleh produk susu fermentasi yang kaya kandungan GABA dengan cara memfermentasi susu menggunakan BAL strain lokal dengan penambahan monosodium glutamat (MSG) sebagai substrat penginduksi sintesis GABA. Kultur starter yang digunakan adalah *Lactocaseibacillus casei* AP, *Lactocaseibacillus casei* AG, *Pediococcus acidilactici* BE, *Pediococcus acidilactici* BK, *Pediococcus pentosaceus* M103 dan *Lactocaseibacillus paracasei* M104 dengan variasi penambahan MSG 0, 1, 2 dan 3% (w/v). Hasil penelitian menunjukkan hanya satu kultur starter yang mampu memproduksi GABA yaitu *Pediococcus pentosaceus* M103 yang ditunjukkan dengan adanya spot merah pada plat *thin layer chromatography* (TLC). Produk susu fermentasi menggunakan kultur starter *Pediococcus pentosaceus* M103 menunjukkan bahwa penambahan MSG pada konsentrasi 1%, 2% dan 3% menghasilkan spot pada nilai Rf yang sama dengan standar GABA. Penambahan berbagai konsentrasi MSG pada proses fermentasi susu berpengaruh nyata ( $P < 0,05$ ) terhadap keasaman, sensori rasa dan *overall*, tetapi tidak berpengaruh nyata ( $P > 0,05$ ) terhadap kadar air, total solid, pH, kadar protein, viskositas, sineresis, total BAL dan sensori (warna, aroma dan tekstur). Susu fermentasi menggunakan kultur starter *Pediococcus pentosaceus* M103 menunjukkan potensi sebagai kultur starter fungsional dalam menghasilkan produk susu fermentasi kaya GABA sesuai dengan kualitas Standar Nasional Indonesia (SNI).

**Kata kunci:** Bakteri Asam Laktat, GABA, Monosodium Glutamat, Susu Fermentasi

## SCREENING OF SEVERAL STRAINS OF LACTIC ACID BACTERIA FOR GAMMA AMINOBUTYRIC ACID PRODUCTION IN MILK FERMENTATION

### ABSTRACT

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Gamma-aminobutyric acid (GABA) is a non-protein amino acid produced through the decarboxylation of glutamate by the enzyme glutamate decarboxylase, synthesized by lactic acid bacteria (LAB) as a starter culture for milk fermentation. This study aimed to obtain fermented milk products with high GABA content by fermenting milk using local strains of LAB with the addition of monosodium glutamate (MSG) as a substrate to induce GABA synthesis. The starter cultures used were *Lacticaseibacillus casei* AP, *Lacticaseibacillus casei* AG, *Pediococcus acidilactici* BE, *Pediococcus acidilactici* BK, *Pediococcus pentosaceus* M103 and *Lacticaseibacillus paracasei* M104, with variations in MSG addition 0, 1, 2 and 3% (w/v). The results showed that only one starter culture, *Pediococcus pentosaceus* M103, was able to produce GABA, as indicated by the presence of a red spot on the TLC plate. Fermented milk products using *Pediococcus pentosaceus* M103 starter culture showed that the addition of MSG at concentrations of 1%, 2% and 3% produced spots with the same Rf values as the GABA standard. The addition of various MSG concentrations during milk fermentation significantly ( $P < 0.05$ ) affected acidity, taste and overall sensory evaluation, but had no significant effect ( $P > 0.05$ ) on moisture content, total solids, pH, protein content, viscosity, syneresis, total LAB count, and sensory attributes (color, aroma, and texture). Fermented milk produced using *Pediococcus pentosaceus* M103 starter culture demonstrated potential as a functional starter culture for producing GABA-rich fermented milk products that meet SNI quality standards.

**Keywords:** Lactic Acid Bacteria, GABA, Monosodium Glutamate, Fermented Milk