

ABSTRACT

CHANGES IN PROTEIN CONTENT, pH, AND SENSORY OF PROBIOTIC TEMPEH JUICE BEVERAGE DURING COLD STORAGE

By

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Tempeh juice beverages with probiotics were considered functional probiotic foods that offered health benefits. This study aimed to evaluate the effect of packaging type (glass bottle and aluminum foil standing pouch with a spout) and cold storage duration (0, 4, 8, 12 days) on protein content, pH, and sensory properties of probiotic tempeh juice beverage to determine its shelf life. The research method used was a two-factorial Randomized Complete Block Design (RCBD) with three replications. Data underwent analysis of variance and followed by a DMRT post-hoc test at a 5% significance level. The results showed that storage duration had a very significant effect on protein content and pH. Additionally, there was a significant effect among treatments on sensory attributes (color, aroma, taste, and overall acceptability). Protein content fluctuated during storage with a decreased on the 8th day due to protein denaturation, then increased at 12 days of storage as an accumulation of raw material protein and microorganism cell walls. pH tended to decrease over time because the activity of microorganisms produced acid. Sensory changes included a paler color, a stronger fermentation aroma, an acidic alcoholic taste, and overall acceptance was neutral. Glass bottle packaging with inert properties and low permeability was more effective in maintaining the stability of protein content, pH, and sensory of probiotic tempeh juice beverage compared to the aluminum foil standing pouch with a spout, so the estimated optimal shelf life was 8 days.

Keywords: cold storage, packaging, protein content, shelf life, tempeh juice.

ABSTRAK

PERUBAHAN KADAR PROTEIN, pH, DAN SENSORI MINUMAN PROBIOTIK SARI TEMPE DALAM KEMASAN YANG BERBEDA SELAMA PENYIMPANAN DINGIN

Oleh

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Minuman sari tempe dengan diperkaya probiotik termasuk pangan fungsional probiotik yang dapat memberikan manfaat kesehatan. Penelitian ini bertujuan mengevaluasi pengaruh jenis kemasan (botol kaca dan *standing pouch* alufoil *spout*) dan lama penyimpanan dingin (0, 4, 8, dan 12 hari) terhadap kadar protein, pH, dan sensori minuman probiotik sari tempe dalam menentukan umur simpan. Metode penelitian yang digunakan adalah Rancangan Acak Kelompok Lengkap (RAKL) 2 faktorial dengan 3 ulangan, kemudian data dianalisis keragamannya dan diuji lanjut DMRT taraf 5%. Hasil penelitian menunjukkan lama penyimpanan berpengaruh sangat nyata terhadap kadar protein dan pH. Selain itu, antar perlakuan berpengaruh nyata terhadap sensori (warna, aroma, rasa, dan penerimaan keseluruhan). Kadar protein berfluktuasi dengan penurunan pada hari ke-8 akibat denaturasi protein, kemudian meningkat pada penyimpanan 12 hari sebagai akumulasi protein bahan baku dan dinding sel mikroorganisme. pH cenderung menurun seiring waktu penyimpanan karena aktivitas mikroorganisme menghasilkan asam. Perubahan sensori meliputi perubahan warna pucat, aroma khas fermentasi semakin kuat, rasa menjadi asam beralkohol, dan penerimaan keseluruhan netral. Kemasan botol kaca dengan sifat *inert* dan permeabilitas yang rendah lebih efektif mempertahankan stabilitas kadar protein, pH, dan sensori minuman probiotik sari tempe dibandingkan *standing pouch* alufoil *spout* dengan pendugaan umur simpan optimal adalah 8 hari.

Kata kunci: kadar protein, kemasan, penyimpanan dingin, sari tempe, umur simpan.