

ABSTRACT

OPTIMIZATION IN PRODUCTION PROCESS OF PROBIOTIC BEVERAGE OF RED GUAVA (*Psidium guajava* Linn.) WITH VARIATION OF SUCROSE AND SKIM MILK

By

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Probiotic beverage was drink that contains bacteria that have beneficial effects for digestion, commonly lactic acid bacteria. Probiotic beverage in general from dairy house that expensive, so that began to be developed probiotic beverage from fruits. Red guava was potentially fruit to be developed in producing probiotic beverage. The aims of this research were to study the effect of addition sucrose, skim milk, interaction sucrose and skim milk to characteristic probiotic beverage of red guava, and get concentration of sucrose and skim milk which produced the best characteristic probiotic beverage of red guava. The treatments were arranged in a Complete Randomized Block Design (CBRD) with two factors and three replications. The first factor was concentration of sucrose 0% (S0), 2% (S1), 4% (S2), and 6% w/v (S3). The second factor was concentration of skim milk 0% (M0), 2% (M1), 4% (M2), and 6% w/v (M3).

The data was further analyzed by using orthogonal polynominal (OP) for total lactic acid bacteria (LAB), total lactic acid, pH, and stability of probiotic beverage. Specific data of taste, aroma, and color score from organoleptic test were further analyzed by using Honestly Significant Difference (HSD) test. The result of OP test showed that concentration of sucroses were no significant to total LAB and lactic acid, but significant with linear trend to pH, linear and quadratic trend to stability probiotik beverage of red guava. Skim milk was no significant to total LAB, but significant with linear and quadratic trend to total lactic acid, quadratic trend to pH, and quadratic trend to stability probiotik beverage of red guava. The result of HSD test for eight best treatments of sixteens treatments showed that S2M0 had the highest taste score and very different with all of other treatments, the highest aroma score and different with S0M0, the highest color score and different with S0M0, S1M0, S3M0, and very different with all of other treatments. Therefore, 2% w/v sucrose and without the addition of skim milk (S2M0) has the best characteristic probiotic beverage of red guava: total LAB $1,5 \times 10^{10}$ colony/mL; total lactic acid 0.870%; pH 3,820; 100% of stability; taste score 3,56 (almost like); aroma score 3,40 (almost like); and color score 3,70 (almost like).

Keywords: probiotic beverage, lactic acid bacteria, red guava, sucrose, and skim milk

ABSTRAK

OPTIMASI PROSES PRODUKSI MINUMAN PROBIOTIK JAMBU BIJI MERAH (*Psidium guajava* Linn.) DENGAN BERBAGAI KONSENTRASI SUKROSA DAN SUSU SKIM

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Minuman probiotik merupakan minuman yang mengandung bakteri menguntungkan bagi saluran pencernaan, umumnya bakteri asam laktat. Minuman probiotik umumnya dari bahan berbasis susu yang relatif mahal, sehingga mulai banyak dikembangkan minuman probiotik dari buah-buahan. Jambu biji merah merupakan buah yang berpotensi untuk dikembangkan dalam pembuatan minuman probiotik. Tujuan penelitian ini untuk mengetahui pengaruh penambahan sukrosa, susu skim, interaksi sukrosa dan susu skim terhadap karakteristik minuman probiotik jambu biji merah, serta mendapatkan konsentrasi sukrosa dan susu skim yang menghasilkan minuman probiotik jambu biji merah dengan karakteristik terbaik. Perlakuan ini disusun dalam Rancangan Acak Kelompok Lengkap (RAKL) dengan dua faktor dan tiga kali ulangan. Faktor pertama adalah konsentrasi sukrosa yaitu 0% (S0), 2% (S1), 4% (S2), dan 6% b/v

(S3). Faktor kedua adalah konsentrasi susu skim yaitu 0% (M0), 2% (M1), 4% (M2), dan 6% b/v (M3).

Data dianalisis dengan uji lanjut Ortogonal Polinomial (OP) untuk parameter total bakteri asam laktat (BAL), total asam laktat, pH, dan stabilitas minuman probiotik. Khusus data skor rasa, aroma, warna dari hasil uji organoleptik dianalisis dengan uji lanjut Beda Nyata Jujur (BNJ). Hasil uji lanjut OP menunjukkan bahwa konsentrasi sukrosa tidak berpengaruh nyata terhadap total BAL dan asam laktat, namun berpengaruh nyata secara linear terhadap pH, linear dan kuadratik terhadap stabilitas minuman probiotik jambu biji merah. Susu skim tidak berpengaruh nyata terhadap total BAL, namun berpengaruh nyata secara linear dan kuadratik terhadap total asam laktat, kuadratik terhadap pH, dan linear terhadap stabilitas minuman probiotik jambu biji merah. Hasil uji BNJ untuk delapan perlakuan terbaik dari enam belas perlakuan menunjukkan bahwa perlakuan S2M0 memiliki skor rasa tertinggi dan sangat berbeda nyata dengan perlakuan lainnya, skor aroma tertinggi dengan berbeda nyata pada perlakuan S0M0, skor warna tertinggi dengan berbeda nyata dengan perlakuan S0M0, S1M0, S3M0, serta sangat berbeda nyata dengan sampel lainnya. Oleh karena itu, perlakuan sukrosa 4% (b/v) dan tanpa susu skim (S2M0) memiliki karakteristik minuman probiotik jambu biji merah terbaik: total BAL $1,5 \times 10^{10}$ koloni/mL; total asam laktat 0,870%; pH 3,820; stabilitas 100%; skor rasa 3,56 (agak suka); skor aroma 3,40 (agak suka); serta skor warna 3,70 (agak suka).

Kata kunci: minuman probiotik, bakteri asam laktat, jambu biji merah, sukrosa, dan susu skim