

PEMANFAATAN EKSTRAK TOMAT (*Solanum lycopersicum*) DAN WHEY SEBAGAI MEDIA TUMBUH ALTERNATIF *Lactobacillus* *bulgaricus* DAN *Streptococcus thermophilus*

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INTISARI

Perbanyakan biomassa sel bakteri dapat dilakukan dengan menumbuhkannya pada media tumbuh yang sesuai dengan kebutuhan nutrisi masing masing bakteri. Penelitian ini dilakukan dengan tujuan untuk mengetahui pengaruh penggunaan whey dan media ekstrak tomat terhadap pertumbuhan dan viabilitas bakteri asam laktat *Lactobacillus bulgaricus* dan *Streptococcus thermophilus* selama penyimpanan. Setiap kultur bakteri diberi perlakuan P1 (Whey 100%), P2 (Whey 25%+ Ekstrak tomat 75%), P3 (Whey 50% + Ekstrak tomat 50%), P4 (whey 75% + Ekstrak tomat 25%) P5 (Ekstrak tomat 100%) serta P6 (MRS) sebagai kontrol. Kultur diuji pertumbuhan dengan melihat nilai *optical density* (OD) selama 10 jam. Masing masing kultur dengan perlakuan media yang berbeda disimpan selama 30 hari pada suhu 4°C dan diukur viabilitas bakteri menggunakan metode *Total Plate Count* (TPC). Data yang diperoleh dari hasil pengujian dianalisis dengan menggunakan analisis variansi pola searah (*oneway*) untuk pengujian komponen bahan baku media dan kemampuan viabilitas bakteri, serta analisis variansi pola faktorial untuk pengujian nilai OD dan rerata total bakteri, dilanjutkan dengan Uji *Duncan's New Multiple Ranges Test* (DMRT). Hasil penelitian menunjukkan bahwa perbedaan variasi media berpengaruh nyata ($P<0,05$) terhadap nilai OD media. Nilai OD *S. thermophilus* tertinggi pada media P4 sebesar 0,480 lebih rendah dibandingkan media MRS yaitu sebesar 0,648. Demikian pula, rerata total nilai OD *L. bulgaricus* tertinggi pada media P2 sebesar 0,962 lebih rendah dibandingkan media MRS yaitu sebesar 1,833. Perbedaan persentase whey dan tomat sebagai media tumbuh bakteri berpengaruh nyata ($P<0,05$) terhadap viabilitas kedua strain selama penyimpanan 30 hari. Rerata total bakteri hari ke-0 dan ke-30 untuk *Streptococcus thermophilus* yang memiliki nilai tertinggi ($P<0,05$) terdapat pada media P3, sedangkan rerata total bakteri *Lactobacillus bulgaricus* tertinggi pada media P2. Kesimpulannya, media kombinasi whey 25% : ekstrak tomat 75% (P2) serta whey 50% : ekstrak tomat 50% (P3) menjadi media alternatif terbaik untuk pertumbuhan dan viabilitas *S. thermophilus* dan *L. bulgaricus*. Namun berdasarkan pertimbangan harga, rasio terbaik adalah media kombinasi 25% whey : 75% ekstrak tomat (P2).

Kata kunci: *Lactobacillus bulgaricus*, *Streptococcus thermophilus*, Ekstrak tomat, Whey susu, Viabilitas bakteri

UTILIZATION OF TOMATO (*Solanum lycopersicum*) EXTRACTS AND WHEY AS ALTERNATIVE GROWTH MEDIA FOR *Lactobacillus bulgaricus* AND *Streptococcus thermophilus*

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ABSTRACT

Propagation of bacterial cell biomass can be done by growing it on a growth medium that is in accordance with the nutritional needs of each bacterium. This research was conducted with the aim of knowing the effect of using whey and tomato extract media on the growth and viability of lactic acid bacteria *Lactobacillus bulgaricus* and *Streptococcus thermophilus* during storage. Each bacterial culture was treated with P1 (Whey 100%), P2 (Whey 25% + Tomato Extract 75%), P3 (Whey 50% + Tomato Extract 50%), P4 (Whey 75% + Tomato Extract 25%), P5 (Extract tomatoes 100%) and P6 as control (MRS). The culture was tested for growth by observing at the value of optical density (OD) for 10 hours. Each culture with different media treatments was stored for 30 days at 4°C and bacterial viability was measured using the Total Plate Count (TPC) method. The data obtained from the test results were analyzed using one-way anova for raw material test and viability bacteria, and factorial patterns for growth test of bacteria and mean of total colony, continued with Duncan's New Multiple Ranges Test (DMRT). The results showed that the difference in media variation had a significant effect ($P < 0.05$) on the growth rate. The highest OD value of *S. thermophilus* in P4 media was 0.480 which was lower than MRS media, which was 0.648. Similarly, the highest OD value of *L. bulgaricus* in P2 media was 0.962, lower than MRS media, which was 1.833. The difference in the percentage of whey and tomato as a growth medium for bacteria had a significant effect ($P < 0.05$) on the viability of the two strains during 30 days of storage. The mean total colony for 30 days of storage for *S. thermophilus* with the highest value ($P < 0.05$) was found in P3 media, and for *L. bulgaricus* was found in P2 media. In conclusion, the best alternative media formulation was found in a combination of 25% whey : 75% tomato extract (P2) and 50% whey: 50% tomato extract (P3). However, based on price considerations, the best ratio is a combination of 25% whey: 75% tomato extract (P2).

Keywords: *Lactobacillus bulgaricus*, *Streptococcus thermophilus*, Tomato extract, Whey milk, Optical density, Viability bacteria