

INTISARI

VIABILITAS DAN STABILITAS *Weissella* sp. GMP12 KERING BEKU YANG DIPREPARASI MENGGUNAKAN RASIO KRIOPROTEKTAN SKIM MILK DAN SUKROSA BERBEDA

Penelitian ini dilakukan untuk mempelajari pengaruh konsentrasi krioprotektan tunggal *skim milk* serta kombinasi *skim milk* dan sukrosa terhadap viabilitas *Weissella* sp. GMP12 setelah pengeringan beku dan selama penyimpanan. Penelitian terdiri dari tiga tahap, yaitu: (1) optimasi konsentrasi *skim milk* (5%, 10%, 15%, 20%, dan 25% b/v) dengan akuades sebagai kontrol, (2) optimasi kombinasi *skim milk* optimal (10% yang diperoleh dari tahap pertama) dengan sukrosa (0%, 2.5%, 5%, 7.5%, 10%, dan 12.5% b/v), (3) pengujian stabilitas pada beberapa suhu selama penyimpanan. Suspensi dikering-bekukan pada suhu -55°C selama 24 jam, kemudian bubuk hasil pengeringan beku disimpan selama 4 minggu pada suhu -20°C, 4°C, dan 25°C. Hasil penelitian menunjukkan bahwa *skim milk* 10% menghasilkan viabilitas tertinggi (40,83%) pada perlakuan tunggal, sedangkan kombinasi *skim milk* 10% + sukrosa 5% menghasilkan viabilitas tertinggi (92,70%). Selama penyimpanan, viabilitas menurun seiring waktu, dengan suhu -20°C memberikan stabilitas terbaik dibanding suhu 4°C dan 25°C, dengan persentase penurunan viabilitas berturut-turut sebesar 16,95%; 28,95%; dan 97,65%.

Kata kunci: *Weissella* sp. GMP12, pengeringan beku, *skim milk*, sukrosa, viabilitas

ABSTRACT

VIABILITY AND STABILITY OF FREEZE DRIED *Weissella* sp. GMP12 WITH DIFFERENT RATIO OF SKIM MILK AND SUCROSE AS CRYOPROTECTANTS

This study aimed to investigate the effect of skim milk as a single cryoprotectant and its combination with sucrose on the viability of *Weissella* sp. GMP12 after freeze-drying and during storage. The research was conducted in three sequential stages: (1) optimization of skim milk concentrations (5%, 10%, 15%, 20%, and 25% w/v) with distilled water as the control, (2) optimization of combinations of the optimal skim milk concentration (10%, obtained from the first stage) with sucrose (0%, 2.5%, 5%, 7.5%, 10%, and 12.5% w/v), and (3) assessment of bacterial stability during storage in various temperature. The bacterial suspensions were freeze dried at -55°C for 24 hours, and the resulting powders were stored for 4 weeks at -20°C , 4°C , and 25°C . The results showed that 10% skim milk resulted in the highest viability (40.83%) among the single treatments, while the combination of 10% skim milk + 5% sucrose provided the highest viability (92.70%). During storage, viability decreased over time, with -20°C offering the best stability compared to 4°C and 25°C , with percentage reductions in viability of 16.95%, 28.95%, and 97.65%, respectively.

Key words: *Weissella* sp. GMP12, freeze drying, skim milk, sucrose, viability