

## ABSTRACT

**Background:** Periodic rejuvenation techniques or short-term storage with repeated inoculation can risk contamination resulting in obtaining pure culture should be re-identified. This technique is not recommended for long-term storage. Other techniques that can be used are lyophilization or freeze drying with the addition of lyoprotectants. The ability to test the life of bacteria can be done by the method of calculating the Total Plate Count (TPC) compared between before and after the lyophilization process.

**Purpose:** The purpose of this study was to determine the description of the TPC of the bacterium *Klebsiella pneumoniae* ATCC 33495 before and after lyophilized and stored for 30 days at 4°C.

**Method:** This research was an observational with the cross-sectional design. The subject used was the bacteria *Klebsiella pneumoniae* ATCC 33495 obtained from Yogyakarta Calibration and Health Laboratory Center that was calculated by TPC before and after lyophilized and stored for 30 days at 4°C.

**Result:** The test result were analyzed descriptively. The average TPC of bacteria before lyophilization was  $5,8 \times 10^5$  CFU/ml, while the average TPC of bacteria after lyophilization was  $4,0 \times 10^5$  CFU/ml. The average difference in TPC of bacteria before and after lyophilization was  $1,8 \times 10^5$  CFU/ml.

**Conclusion:** The average TPC of bacteria before lyophilization was  $5,8 \times 10^5$  CFU/ml, the average TPC of bacteria after lyophilization was  $4,0 \times 10^5$  CFU/ml, and the average difference in TPC of bacteria before and after lyophilization was  $1,8 \times 10^5$  CFU/ml.

**Keyword:** Total Plate Count (TPC), lyophilization, bacteria, *Klebsiella pneumoniae*

## ABSTRAK

**Latar Belakang:** Teknik peremajaan berkala atau penyimpanan jangka pendek dengan inokulasi berulang dapat berisiko kontaminasi yang berakibat untuk memperoleh kultur murni harus melakukan identifikasi ulang. Teknik ini tidak dianjurkan untuk penyimpanan jangka panjang. Teknik lain yang dapat digunakan adalah teknik liofilisasi (*lyophilization*) atau penyimpanan kering beku (*freeze drying*) dengan penambahan lioprotektan (*lyoprotectant*). Uji kemampuan hidup bakteri dapat dilakukan dengan metode perhitungan Angka Lempeng Total (ALT) yang dibandingkan antara sebelum dan sesudah proses liofilisasi.

**Tujuan:** Tujuan penelitian ini untuk mengetahui gambaran ALT pada bakteri *Klebsiella pneumoniae* ATCC 33495 sebelum dan sesudah diliofilisasi dan disimpan 30 hari pada suhu 4°C.

**Metode Penelitian:** Penelitian ini merupakan penelitian observasional dengan desain penelitian *cross-sectional*. Subjek yang digunakan adalah bakteri *Klebsiella pneumoniae* ATCC 33495 yang diperoleh dari Balai Laboratorium Kesehatan dan Kalibrasi Yogyakarta yang akan dihitung ALT sebelum dan sesudah diliofilisasi dan disimpan 30 hari pada suhu 4°C.

**Hasil Penelitian:** Hasil pemeriksaan dianalisis secara deskriptif. Rerata ALT bakteri sebelum liofilisasi sebesar  $5,8 \times 10^5$  CFU/ml, sedangkan rerata ALT bakteri sesudah liofilisasi sebesar  $4,0 \times 10^5$  CFU/ml. Diperoleh selisih rerata ALT bakteri sebelum dan sesudah liofilisasi sebesar  $1,8 \times 10^5$  CFU/ml.

**Kesimpulan:** Didapatkan rerata ALT bakteri sebelum diliofilisasi sebesar  $5,8 \times 10^5$  CFU/ml, rerata ALT bakteri sesudah diliofilisasi sebesar  $4,0 \times 10^5$  CFU/ml, dan selisih rerata ALT bakteri sebelum dan sesudah diliofilisasi sebesar  $1,8 \times 10^5$  CFU/ml.

**Kata Kunci:** Angka Lempeng Total (ALT), liofilisasi, bakteri, *Klebsiella pneumoniae*