

**COMPARISON OF FOUR COLONY COUNTING APPLICATIONS TO
MANUAL COUNTING IN ALT TESTING OF REPACKAGING CHOCOLATE
BAR PRODUCTS**

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ABSTRACT

Chocolate is a product that is widely loved by consumers, so testing for microbial contamination is necessary to ensure its quality and safety. Manual counting of microbial colonies using the ALT method is often time-consuming and tiring, especially when performed on large samples. Therefore, the use of a colony counter application is an alternative to help the colony counting process quickly and practically. In this study, four colony counter applications were used to compare their respective performance in detecting colonies based on their accuracy and precision. The four colony counter applications were CFUCalc, Promega Colony counter, Colony counter PRO, and @BactLAB on repackaged chocolate bar samples using PCA media. Testing the accuracy and precision of the samples was carried out by first growing colonies from the sample on PCA media, then manually counting the colonies with a Colony counter tool and taking pictures of the colonies for analysis using the four applications. Accuracy analysis used a regression value close to 1 and precision was assessed based on $\%RSD \leq 2\%$. The regression values of CFUCalc, Promega Colony counter, Colony counter PRO, and @BactLAB were 0.0104; 0.0733; 0.969; 0.2065. The $\%RSD$ values were 30.47%; 19.47%; 28.08%; 0%, respectively. Colony counter PRO had the best accuracy with a regression value of 0.969 and the @BactLAB application had the best precision with a $\%RSD$ value of 0%.

Keywords: *Repackaged chocolate bar, ALT, colony counter, colony counting application.*