Abstract

With the uncontrolled and sudden outbreak of foodborne diseases, it is important to address the need for accurate and cost-effective detection methods for foodborne pathogens. *Salmonella Typhimurium* and *Enterohemorrhagic Escherichia coli* are major foodborne pathogens that cause severe gastroenteritis and hemorrhagic colitis, respectively, which pose an authentic threat to public health and food safety. Current methods for detecting pathogens are bacterial culture and PCR. Although culturing pathogens leads to highly accurate results, it still takes a long time. Whereas PCR lacks sensitivity and unaffordable prices. Hence why LAMP development is needed to solve the drawbacks of existing detection methods. In this study, LAMP primers will target six different regions within the conserved *invA*, *ttrC,* and *fimY* genes for *S. Typhimurium*. While the *eae, stx2*, and *hlyA* are the genes targeted for *EHEC*. These genes were chosen due to their specificity, where their sequence is not available in other pathogens. By selecting highly conserved regions, it ensures precision and reliability. The LAMP reaction was optimized to perform efficient amplification. These optimizations cover the best temperature and cycle time for optimal results, which is at 65°C at 30 minutes. Tested for both non-colorimetric and colorimetric LAMP reactions. The primers also underwent specificity and sensitivity testing that results in the primers being specific to the certain target microorganism. It is also discovered that using 50 ng of DNA ensures the best result for the reaction. This was done to ensure that the study developed a rapid, cost-effective, highly specific LAMP-based detection method for foodborne pathogens that may be instrumental in routine food safety monitoring and diagnostics.

Keywords: LAMP, *Salmonella typhimurium*, *Enterohemorrhagic Escherichia coli*.