

ABSTRACT

Caffeine is a stimulant compound commonly found in energy drinks. Excessive caffeine consumption can cause health side effects, therefore monitoring caffeine levels in products circulating in the market is crucial to ensure compliance with safety limit regulations. This study aimed to determine caffeine levels in six energy drink samples (three local products and three imported products) obtained from the Shopee marketplace. The method used was High Performance Liquid Chromatography (HPLC) with a mobile phase of Methanol:Water (60:40) and a UV detector at a wavelength of 272 nm. The research stages included sample identification, wavelength determination, system suitability testing, and method validation, which covered linearity, LOD, LOQ, precision, and accuracy. The method validation results showed a correlation coefficient (r) of 0.999, an LOD of 2.477 ppm, an LOQ of 7.508 ppm, a precision (%RSD) of 0.24%, and an accuracy (recovery) of 97–101%. The assay results showed that all samples had caffeine levels ranging from 54.43 mg to 144.38 mg per serving. All tested samples met the safety requirements according to BPOM, SNI, and FDA regulations, which is not exceeding 50 mg per serving.

Keywords: Caffeine, Energy Drinks, HPLC, Method Validation, Determination.