ABSTRACT

The quality of cooking oil has a significant impact on health. This research aims to explore the potential of smartphone technology in supporting cooking oil quality control using machine learning algorithms. A total of 20 cooking oil samples were collected and categorized based on Free Fatty Acid (FFA) values into three categories: good, bad, and very bad. Photos of oil samples were taken using smartphones and used as input to train machine learning models on the Google Teachable Machine platform. The results showed that the machine learning algorithm was able to classify the quality of cooking oil based on photos with an accuracy rate of up to 100% on 6 test samples. Visually, there are differences in color characteristics and clarity between cooking oil with different quality categories. Good category oils tend to be clear and bright yellow, bad oils start to become cloudy, while very bad oils are dark and thick in color. However, visual detection alone has limitations because some oils with high FFA levels still appear quite clear. AI technology has the potential to be a more objective tool in assessing the quality of cooking oil compared to human visual evaluation. The AI model can process various parameters such as color, texture, and invisible change patterns, thereby improving the accuracy of oil quality classification. Although the results of the study are promising, there are still limitations such as a relatively small sample size and a lack of variation in conditions. More research is needed with larger and more diverse datasets to improve the generalization of AI models.

Keywords: *Machine learning algorithms, Cooking oil quality, Digital image processing, Smartphones*