

ABSTRACT

Meat adulteration, particularly the mixing of beef with pork, poses a serious problem in Indonesia, especially for the Muslim community that requires the consumption of halal food. The visual differences between beef and pork are often difficult to detect with the naked eye, necessitating a technology-based approach to accurately identify meat types. This study aims to implement the ResNet50 architecture to automatically classify images of beef and pork. The dataset used is the Pork, Meat, and Horse Meat Dataset. The model is developed using transfer learning by leveraging the pretrained weights of ResNet50 on ImageNet. ResNet50 is chosen due to its capability in handling very deep networks without performance degradation and its proven effectiveness in various image classification tasks. This research also explores different combinations of hyperparameters such as batch size, learning rate, and dropout rate. The image dataset was divided into 80% training data and 20% testing data, with 20% of the training data used as validation data. Experimental results show that the best performance is achieved with a combination of batch size 8, learning rate 0.0001, and dropout rate 0.2. Evaluation using a confusion matrix demonstrates high performance, with an accuracy of 98%, precision of 100%, recall of 96%, and F1-score of 98%. All evaluation metrics were calculated using pork as the positive class. These results indicate that the ResNet50 model is effective in distinguishing between images of beef and pork, and can be utilized as a tool to objectively verify the halal status of meat products.

Keywords : Image Classification, Beef, Pork, ResNet50, Transfer Learning.