

# Food safety: Two-stage process of extraction and classification to identify ingredients in photos of food

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Research [published](#) in the *International Journal of Reasoning-based Intelligent Systems* discusses a new approach to the identification of ingredients in photographs of food. The work will be useful in our moving forward on food safety endeavors.

Sharanabasappa A. Madival and Shivkumar S. Jawaligi of Sharnbasva University in Kalburgi, Karanataka, India, used a two-stage process of feature extraction and classification to improve on previous approaches to ingredient identification in this context.

The team explain that their approach used scale-invariant feature transform (SIFT) and [convolutional neural network](#) (CNN)-based deep features to extract both image and textual features. Once extracted, the features are fed into a hybrid classifier, which merges neural network (NN) and long [short-term memory](#) (LSTM) models.

The team explains that precision of their model can be further refined through the application of the Chebyshev map evaluated teamwork optimization (CME-TWO) algorithm. All of this leads to an accurate identification of the ingredients.

Food management in a globalized world is critical to worldwide supply chains, to [food security](#), traceability and detection of fake food and food fraud. We, as consumers and diners, need to know that the ingredients in the food we eat, especially in the context of diverse dietary preferences and health considerations, are valid.

The team found that their approach works more effectively than current ingredient [identification](#) systems. Specifically, they demonstrated that the HC + CME-TWO model performs the best by a large margin, which can thus be taken as indicating a significant advancement in this area. It

is the use of a hybrid classifier and the fine-tuning of weightings using the CME-TWO algorithm that leads to the marked improvement in accuracy and reliability. Moreover, the team says that there is still room for improvement in terms of shortening processing times through optimization.

The work focuses on [food safety](#) but could be used to address the challenges facing regulators and others attempting to ensure food authenticity, especially among high-value foods.

**More information:** Sharanabasappa A. Madival et al, Food ingredient recognition model via image and textual feature extraction and hybrid classification strategy, *International Journal of Reasoning-based Intelligent Systems* (2024). [DOI: 10.1504/IJRIS.2024.137455](https://doi.org/10.1504/IJRIS.2024.137455)

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