CLAIMS

1. A method for predicting quantitative measures of oil adulteration of an edible oil sample, the method comprising:

receiving at least part of a spectral data of the edible oil sample, wherein the spectral data comprises Fourier transform near-infrared (FT-NIR) spectral data or Raman spectral data;

providing a single prediction model capable of generating a prediction of at least two adulterants of different types in the edible oil sample, wherein the single prediction model is a non-linear model comprising a deep neural network; and

processing the at least part of the spectral data using the single prediction model.

2. The method of claim 1, wherein the single prediction model is constructed from a matrix of features, wherein each feature corresponds to an intensity of the spectra data at a specific wave number.

3. The method of claim 1 or 2, wherein the edible oil sample is selected from the group consisting of a peanut oil sample, an olive oil sample, a corn oil sample, a coconut oil sample, a cottonseed oil sample, a palm oil sample, a canola oil sample, a safflower oil sample, a sesame oil sample, a soybean oil sample, a sunflower oil sample, a camellia seed oil sample, a linseed (flaxseed) oil sample, and a sample of oil with a relatively higher proportion of certain fatty acids, including high erucic acid rapeseed oil, low erucic acid rapeseed oil, or high oleic acid sunflower oil.

4. The method of claim 3, wherein the edible oil sample is the peanut oil sample.

5. The method of any one of the preceding claims, wherein the step of processing the at least part of the spectral data using the single prediction model comprises generating the prediction of the at least two adulterants, each adulterant being of a different oil type from the other adulterant and the edible oil sample.

6. The method of any one of the preceding claims, wherein

the deep neural network comprises an input layer, an output layer comprising multiple outputs, and multiple layers between the input layer and the output layer, and

the prediction of the at least two adulterants are substantially simultaneously generated at the output layer.

7. The method of any one of the preceding claims, wherein the prediction comprises a type and a percentage amount of each of the at least two adulterants.

8. The method of any one of the preceding claims, further comprising prior to the step of receiving the at least part of the spectral data, obtaining the spectral data using Fourier transform near-infrared (FT-NIR) or Raman spectroscopy.

9. A computer readable storage medium comprising computer readable instructions operable when executed by a computer to predict quantitative measures of oil adulteration of an edible oil sample, the computer readable instructions configured to perform a method of any one of claims 1 to 8.

10. An apparatus or system comprising:

a receiving unit configured to receive at least part of a spectral data of an edible oil sample, wherein the spectral data comprises Fourier transform near-infrared (FT-NIR) spectral data or Raman spectral data;

a memory for storing a single prediction model capable of generating a prediction of at least two adulterants of different types in the edible oil sample, wherein the single prediction model is a non-linear model comprising a deep neural network; and

a processor configured to access the single prediction model stored in the memory to perform steps of a method of any one of claims 1 to 8 for generating a prediction of quantitative measures of oil adulteration in the edible oil sample.