ABSTRACT

The detection and monitoring of nitrogen levels in fruits and vegetables are crucial for ensuring food quality, safety, and shelf-life extension. By utilizing Arduino Nano microcontroller and an MQ135 gas sensor for chemical sensing in fruits and vegetables will help to build a cost effective and efficient model. The MQ135 sensor, known for its capability to detect a wide range of gases, including nitrogen dioxide (NO2), serves as the primary sensing element in this setup. The Arduino Nano acts as the control unit, facilitating data acquisition from the MQ135 sensor and processing it to derive nitrogen concentration levels. The system employ a calibration process to correlate the sensor readings with known nitrogen concentrations in a controlled environment. The calibration data is then used to develop an algorithm for accurate nitrogen level estimation. To validate the effectiveness of our approach, The experiments on various fruits and vegetables with known nitrogen content. The Arduino Nano collects real- time sensor data as the MQ135 sensor interacts with the gases emitted by the samples. The system analyze the sensor outputs and compare them with reference nitrogen values obtained through conventional laboratory methods. The results demonstrate a strong correlation between the MQ135 sensor readings and the actual nitrogen content of fruits and vegetables. The Arduino Nano-based system exhibits reliable performance accurately detecting nitrogen levels.