ABSTRACT

The role of food additives, especially preservatives, is becoming increasingly important in line with advances in technology for the production of synthetic food additives. Abuse of adding dyes to food is still often found, for example the use of dyes for textiles such as rhodamine B, as well as substances that are harmful to the body such as borax and formalin.

From these problems, a device was made using the ESP8266 microcontroller by utilizingtechnology *Internet of Things* (IoT), the system was designed using a 16x2 LCD with a TCS34725 Color sensor. Testing the content of rhodamine-b, borax, formalin, and textile dyes is carried out by mixing turmeric extract in the sample, the color changes that occur in the sample will be read by the TCS34725 color sensor and sent *wirelessly* to an Android application. Data classification is done using the Fuzzy Mamdani method.

After several tests were carried out, the system succeeded in detecting the levels of formalin, textile dyes, rhodamine and borax in food and displayed on the Android application. The results of the QoS performance test from the tool to firebase get a delay value of 5.938 ms and a throughput of 44.06 Mbps, a test from firebase to an Android application gets a delay value of 5.876 ms and a throughput value of 52.16Mbps, and testing from the tool to the Android application has the delay value is 4.666 ms with a throughput value of 62.27 mbps.

Keywords: *ESP8266, Internet of Things, Color Sensor TCS34725, Wireless, Fuzzy Mamdani.*