

ABSTRAK

Kesegaran daging adalah faktor utama dalam memilih kelayakan sebuah daging untuk dikonsumsi. Harga daging sapi yang mahal disebabkan oleh berbagai faktor, termasuk biaya transportasi dan terbatasnya pasokan. Penelitian ini bertujuan untuk merancang alat berupa *conveyor* yang dilengkapi dengan sistem pendeteksi otomatis kesegaran daging sapi berdasarkan dua parameter utama, yaitu warna dan kandungan gas amonia, menggunakan metode *Naïve Bayes*. Sistem ini terdapat beberapa sensor, termasuk TCS3200 untuk mendeteksi warna (nilai RGB), dan MQ-135 untuk mendeteksi gas amonia yang berkaitan dengan tingkat kebusukan daging, dan sensor *proximity* digunakan untuk mendeteksi daging setelah dilakukan pembacaan warna untuk menggerakkan aktuator serta sensor ultrasonik untuk mendeteksi jarak sampel daging yang bergerak di atas *conveyor*. Proses dimulai dengan menggerakkan *conveyor* yang membawa sampel daging di depannya. Sensor ultrasonik membaca sampel jarak, dan jika jarak yang terdeteksi adalah 3 cm, *conveyor* berhenti. Pada titik ini, sensor TCS3200 membaca nilai RGB untuk menentukan warna daging, sementara sensor MQ-135 mengukur kandungan amonia. Data yang diperoleh dari sensor-sensor tersebut digunakan dalam algoritma *Naïve Bayes* untuk menghitung probabilitas kesegaran daging. Hasil pengujian menunjukkan akurasi *Naïve Bayes* sebesar 92,5%. Daging segar memiliki nilai R = 78,50; G = 138,44; B = 128,76; MQ-135 = 47,58, daging sedang R = 85,02; G = 150,52; B = 137,76; MQ-135 = 50,94, dan daging busuk R = 260,34; G = 401,80; B = 349,76; MQ-135 = 35,02. Perbedaan nilai tersebut menunjukkan pola yang jelas dalam membedakan tingkat kesegaran daging.

Kata kunci : Daging Sapi, Sensor MQ-135, Sensor TCS3200, dan *Naïve Bayes*.

ABSTRACT

The freshness of meat is a primary factor in determining whether it is suitable for consumption. The high price of beef is influenced by various factors, including transportation costs and limited supply. This study aims to design a conveyor-based device equipped with an automatic detection system for beef freshness based on two main parameters, namely color and ammonia gas content, using the Naïve Bayes method. The system incorporates several sensors, including the TCS3200 for detecting color (RGB values) and the MQ-135 for detecting ammonia gas associated with the level of meat spoilage. A proximity sensor is used to detect the meat after color readings are taken in order to activate the actuator, while an ultrasonic sensor detects the distance of the meat sample moving along the conveyor.

The process begins by activating the conveyor, which carries the meat sample in front of it. The ultrasonic sensor reads the sample distance, and when the detected distance reaches 3 cm, the conveyor stops. At this point, the TCS3200 sensor reads the RGB values to determine the color of the meat, while the MQ-135 sensor measures the ammonia content. The data collected from these sensors is then processed using the Naïve Bayes algorithm to calculate the probability of meat freshness. Testing results showed a Naïve Bayes accuracy of 92.5%. Fresh meat had values of $R = 78.50$, $G = 138.44$, $B = 128.76$, and $MQ-135 = 47.58$; medium-quality meat had $R = 85.02$, $G = 150.52$, $B = 137.76$, and $MQ-135 = 50.94$; while spoiled meat had $R = 260.34$, $G = 401.80$, $B = 349.76$, and $MQ-135 = 35.02$. These differences in values demonstrate a clear pattern in distinguishing the levels of meat freshness.

Keywords: Beef, MQ-135 Sensor, TCS3200 Sensor, and Naïve Bayes.