CLASSIFICATION OF COW'S MILK BASED ON PH AND COLOR USING ARTIFICIAL NEURAL NETWORK BASED ON ARDUINO MICROCONTROLLER

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ABSTRACT

Cow's milk is a liquid that comes from the udder of a healthy cow, which is taken by milking the right way. Cow's milk is a source of food that has good nutrition for the body, such as calories, protein, fat, lactose, calcium, vitamin A and mineral salts. Cow's milk is widely used as a variety of foodstuffs such as yogurt, cheese, UHT milk, formula milk and others. Cow's milk is still very much needed, compared to other animal milk. However, many breeders commit fraud in order to increase the quantity of cow's milk. One of the frauds committed is mixing cow's milk with other liquid ingredients, such as water. This will result in the nutritional content of cow's milk damaged and will cause disease for those who consume it. So we need a prototype that is used to classify pure and impure cow's milk. The parameters used to distinguish pure and impure cow's milk are pH and color. To get the pH and color values, a sensor is needed, the sensors that can be used are the E-201-C pH sensor and the TCS3200 color sensor. These sensors can be connected to a microcontroller, such as Arduino. In classifying cow's milk a method is needed, one method that can be used is Backpropagation Neural Network. This method can be applied to an Arduino microcontroller. So in this study, a prototype classification of cow's milk was made based on pH and color using an Arduino microcontroller-based Artificial Neural Network. Based on the tests carried out, the prototype can classify cow's milk with levels of Accuracy, Precision, Sensitivity and Specificity of 95%, 92%, 98% and 92%.

Keywords: *Classification of cow's milk, pH sensor, color sensor, Arduino, Artificial Neural Network.*