

## **ABSTRACT**

There is a chronic condition that affects the body's metabolism known as Diabetes Mellitus (DM) or diabetes. Diabetes has a significant impact on blood glucose regulation, which should ideally be within the range of 90 to 140 mg/dL. Blood glucose measurement plays a crucial role in diabetes management. Measurement methods involve invasive and non-invasive approaches.

Non-invasive blood glucose measurement technology is still under development. Although it promises real-time monitoring, the level of accuracy achieved is not yet comparable to that of invasive methods. However, this development is expected to provide more convenience for diabetics.

A product is proposed to develop a device capable of non-invasive glucose measurement with good accuracy. In addition to providing information on glucose levels, the device can also present glucose measurement values on sugar lauric acid. In addition to the technical aspects, this product aims to provide comfort through non-invasive measurements that can reduce the risk of infection to the user. Based on experiments, this tool is able to provide significant gap results with an average of 0.1 for each sugar and liquid composition. At 10 grams of sugar in 500ml of distilled water, the sugar content is 2% and at 30 grams of sugar in 500ml of distilled water, the sugar content is 5%. In addition, experiments with the conversion equation from ADC value to mg/dL resulted in an average error of 0.87% and an average accuracy of 99.13%.

**Keywords:** Diabetes Mellitus, Blood Glucose, Non-Invasive, Diabetes Management