ABSTRACT

Whole milk is high in nutrients and water and has a neutral acidity level. Milk contains glucose and its glucose level needs to be identified or measured because it is important for information before consumption. To measure sugar content through dielectric properties in milk has several traditional methods and will be time consuming and expensive. However, the microwave technique using a microstrip antenna that functions as a sensor can be useful as a faster method to determine the dielectric properties of milk.

A microwave monitoring system of liquids using a microstrip sensor system is proposed to determine the sugar content. Microwaves are electromagnetic waves with a super high frequency, which is above 3 GHz. The antenna is designed with the aim of being able to function as a sensor to determine sugar content, so the frequency of this antenna is 6.8 GHz. When the glucose content of milk changes, the dielectric properties of the surrounding tissue will also change. These changes can be calibrated to detect changes in the glucose concentration in a product.

The simulation results of the antenna that have been attached to a glass object containing milk working at a frequency of 6.8 GHz get the results that the Return Loss and VSWR are shifted compared to the antenna that is not attached to the object. The frequency results obtained are then analyzed using the curve fitting technique. The Curve Fitting equation gets an R-square value of 1, then the resulting Fourier linear regression model is able to estimate well because getting a coefficient of determination (R2) value of 1 gives an understanding that only 100% of the ability of the estimated model or straight-line equation.

Keywords: Pure Milk, *Microstrip, Glucose, Return Loss, VSWR*