

DETERMINATION OF MOISTURE CONTENT, PH AND RIPENESS LEVELS OF PINEAPPLE USING HORN ANTENNA- BASED REFLECTOMETER

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ABSTRACT

This paper presents a microwave horn antenna based sensor to predict the moisture content of N36 pineapple, pH concentrations of such pineapple for specific growing stages and ripeness level according to that moisture and pH values. The moisture measurements are statistically correlated to the reflected voltage of the horn based sensor. The system is consist of USB stick synthesizer to generate the signals, Directional coupler to collect the reflected signal from the horn antenna, and RF diode detector to detect the reflected signal from the sample (pineapple) under test. Measuring the pH, Moisture content using microwave system this will increase the quality of the fruit of industrial products due to fast measurement. A wide band horn antenna and directional coupler are used for purpose of wide resolution range of investigation. It is seen that by increasing the power at $f=10$ GHz the $V_{reflected}$ will be highly correlated equation with moisture content. Matlab 2014b is used for statistical analysis.

Key words: Moisture content, Reflected voltage, Pineapple.

INTRODUCTION

The recent statistics of the pineapple in the world made up about 25 % of the total tropical fruit production [1]. Nowadays people like more natural and healthy food products, while the last are highly influenced by production process stages where acidity (pH), taste, which also, are varying according to the reservation environment of the cans like temperature, time, types of bacteria being created inside it which affected by the concentration of a justified pH inside the can [2]. Canning process includes pasteurization of the fruit to be 5 in order to allow useful bacteria to grow for purpose of food reservation, a conventional testing of PH needs to blend the fruit samples with distilled water, and then the calibration is required; all these long procedures take longer time for being ready for querying [3]. In this research a microwave sensor based on reflected voltages is developed using set of substantial devices in order to get the voltages being reflected from the pineapple samples. So by knowing the PH the factory can produce an accurate PH justifications. In addition it controls the period of expiry date.