

1. INTRODUCTION

1.1 Overview

Food poisoning has been the source of innumerable diseases and illnesses over the years. Unwary consumption of stale food not only results in ill health, it also leads to enormous wastage of food. In a country like India, where majority of the population struggles for their daily bread, efficient preservation of existing food resources is critical. The great amount of money spent on diagnosis and treatment of diseases is also a cause for concern. The need of the hour is to develop an efficient method to reduce the consumption of spoilt food and hence the wastage of good food.

Extensive research to tackle the issue of food poisoning and reduce the damage to unwary consumers has given rise to innovative devices. The use of chemical, optical and electrical sensors to determine the staleness of food has proved to be a boon to consumers of packaged foods. In this project, we attempt to develop a smart sensor plate that can detect the freshness of household food items like dairy, meat and cooked items.

Smart Plate is a flat plate consisting of a variety of sensors that are activated depending on the food item. This plate can be placed in any utensil and a panel can be used to select the type of food item. Further functionalities can be implemented into this device with the integration with smart phones. A mobile app can be designed specifically to receive data from the Smart Plate to generate advance warnings regarding the status of the food item.

1.2 Objectives

To develop a Smart Plate with integrated sensors that detects food quality and display the degree of freshness of food items.

- i. To identify the sensors that can measure appropriate parameters for quality detection.

- ii. To develop a database of acceptable parameter values that indicates safe food.
- iii. To interface the sensors with a microcontroller and develop a user friendly display to indicate food quality.

1.3 Summary

SMART PLATE FOR THE DETECTION OF FOOD QUALITY is designed to ensure quality of the food used by the consumers, and improve their health. The sensor plate is able to detect spoilage of common household items like dairy, meats and fried items. The display system accurately displays the freshness level of the food, enabling consumers to be well aware of the quality of food. This design is simple, effective & feasible and cost effective. For dairy items like milk and cream, pH is the most crucial parameter that determines freshness. Sour milk or cream displays a lower pH value, hence pH sensors are used to detect the spoilage for dairy items such as milk, cheese etc. The amount of moisture in the air can be used to determine the freshness of fried and baked items like chips and biscuits. When the moisture content increases, it is indicative of stale food. For this purpose moisture sensor is used to detect the moisture level in dairy products. For Meats items like chicken and fish release complex amines when spoilt. The level of amines can determine the freshness of meat. A gas sensor is used to determine the freshness of meat and fish.