IMPLEMENTATION OF MILK QUALITY AND SPOIL DETECTION SYSTEM usingWSN WITH IOT

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Abstract

As milk is the major food for all the infants, it has to be monitored for the safety. The main objective of the project is to bring out the product which determines the quality and the safety of milk for consumption. As the milk is kept for several days, the expansion of bacterium will get increased which ends up in undesirable smell, style and harmful substances. Hence there is a necessity for monitoring system to discover and determine the spoilage of milk and turn out into a healthy product The main objective of this system is to provide safety and quality for milk by inbuilt sensors which indicates the quality or spoilage of milk. The sensors are thus inbuilt inside the case and the output is thus shown with the help of monitoring displays LCD, buzzer/LEDS externally.

Keywords:

1. Introduction

Milk production in one of the main sources of livelihood of people in and around the world. In India production of milk is done almost in each and every village. India is the largest producer of milk accounting to approximately one-fourth of total world's production. Thus, it becomes important to have the highest quality of milk for its consumption. Milk is often transported from producing farms to processing plants. The journey between these points can be of several kilo meters. Hence, it is of paramount importance to have assurance of milk quality not getting spoilt during transportation. By incorporating various controlling and sensing techniques such as using air cooled tankers and chilling facilities in transportation vehicles, the reliability in quality of milk has increased

This arises the need for wireless technologies and automation in transportation of milk. Various sensors are interconnected to monitor a physical entity with the help of a Wireless Sensor Network (WSN).

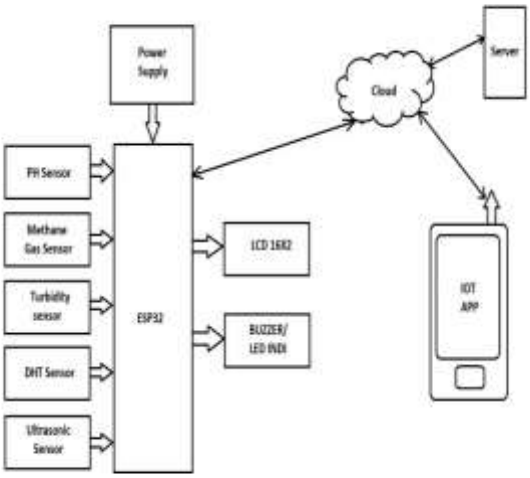


Fig. 1. Block Diagram of the Complete System

1.1 Literature review

Lucas de Souza Ribeiro et. al. [2] states that using a cryoscope, detection of water adulteration in milk can be performed. The GaAsSb sensors, which show quick reaction and great affectability to the NIR range, were utilized to distinguish diffusely reflected light. The proposed instrument was tried on milk tests corrupted with water. The outcomes displayed high coefficients of assurance, higher than 0.99. In this manner, the created framework might be utilized for identification of milk debasement. Carla Margarida Duarte et. al.[9] developed a attractive counter that identifies the nearness of Streptococcus agalactiae (a Group B Streptococci) in crude milk. This gadget permits the investigation of crude milk without crossing over the microfluidic channels, making this incorporated stage exceptionally appealing for quick bacteriological pollution screening. Wesley Becari et.al. [7] developed a methodology for the detection of bovine milk adulteration by applying electrical impedance measurements. The classification of the results is proposed through ak- nearest neighbors algorithm that allows to quantitatively qualify the samples of pure and adulterated milk. Pallavi Gupta et. al [5] displayed another framework, which is utilized for the location and estimation of corruption of clarified butterfat, a classification of anhydrous milk fat. Identification of defilement by at least 20% of creature muscle versus fat's in clarified margarine is effectively and monetarily done. Dari de O. Toginho Filho and Vanerli Beloti [3] proposed a model of a computerized photometer, microcontrolled, versatile gadget, which utilizes three LEDs with discharge in the NIR area and was created without the utilization of focal points, filters or moving parts. The outcomes demonstrate that the model reaction resembles the one of a business cryoscope, yet quicker.

1.2 System overview

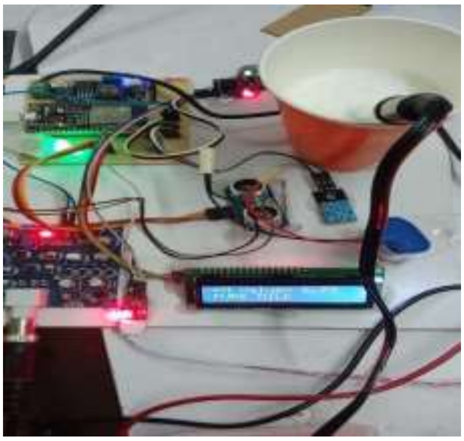
This proposed system is implemented using ESP32s microcontroller. All the sensors are combined to form compact and flexible system which analyze and classify the quality of milk into different grades. Over the last decade, new methods have been researched with the purpose of developing more accurate and efficient means of detecting milk spoilage. Problem faced in small diaries and by the individual also can be prevented by detecting the quality of milk, and also prevent from causing the hazardous diseases by detecting the adulteration of milk. In this proposed we use more sensors when compared to existing system.

2.Working Principle

IOT based Arduino Microcontroller is used which can drive by 5V DC supply; the quality of the milk is maintained by using the smart sensors pH sensor helps to measure the acidity or alkalinity of the water with a value between 0-14.The gas sensor used to detect the odor of the milk. Turbidity sensor measure the amount of light that is scattered by the suspended solids. DHT sensor detects the temperature and also relative humidity. Ultrasonic sensor measures and records the milk fat, milk quantity and added water, these sensors are connected to the ESP32 microcontroller with power supply. T he output is observed on the LCD display screen, if the milk contains any chemicals or added water it displays the temperature, humidity and PH level values and red led glows and buzzer will be ON. If the milk doesn’t contain any chemicals or added water the green led glows.

3.Results and Discussion

According to the observations, if the milk is in good standards then the pH value is 6.7 – 6.9 and if the milk got spoiled then the pH value is 5.96



Obsevations:

Samples	Turbidity	pH	Temperature	Gas
Pure milk	96.126	5.6	29 °C	0
Water+milk	84.986	5.1	28°C	0
Milk+soap	96.354	8.9	30°C	20
Milk+salt	95.214	4.8	29°C	10

The above table is observed according to our experiment

4.CONCLUSION

In this paper, we developed a IoT based system which gives faster and more accurate results. In our proposed system, Microbial activity is determined using gas sensor. The high-quality milk should have no salinity, so salinity of the milk is measured by using a salinity sensor and level of the milk will be measured by using a level sensor. In addition to that customer should have their own card for accessing the milk diaries. The milk collection parameters such as weight, FAT & CLR are measured by this system gives fast and more accurate results than the existing systems which are more costly than the developed one. As a future work, it is intended to implement IOT and DBMS for billing system, in which each user will have a data base of their own, in which the data is recorded for the amount of milk taken, in this payment can be done using debit or credit cards, payment can be done on monthly basis. Further this system will be used by the management for tracking the milk production and marketing, all the information from milk production to marketing will be stored in management's website which can be accessed by any user having account in that firm.

5.REFERENCES

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