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A Literature Review on Automatic Milk Quality Analyzing & Billing System

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Abstract: ***Agriculture is an important part of India and the dairy business is an overall benefit to India's business or economy. Farmers supply milk to dairy products and receive payments based on the purity of the milk. As it is known, the world is moving fast now that people with more luxurious lifestyles are responding to trends and needs. Therefore, there is a need to improve the agricultural lifestyle of India. In milk, various factors are calculated, such as fat, pH, and the desired ratio of fat mass. The system calculates these parameters and the microcontroller reads the data and sends to android phone. The Blynk app installed on the phone can be used to perform billing calculations and calculate the daily payments. This technology offers a clever mobile application that assist in determining the amount of fat in milk. Both Arduino boards and microcontrollers may use the sensor. The technique for identifying fat in milk samples is very inexpensive. The sector offers fair rates to farmers and gives governments with real-time dairy value and proportions through the Internet of Things (IoT) procedure. Humidity and gas sensors are added to the system to make it even more complex.***

Keywords: Micro-controller, IoT Module, LDR Sensor, pH Sensor, Humidity Sensor, Gas Sensor.

I. INTRODUCTION

Change the way existing modules like dairy and agriculture work, depending on the times and circumstances. First you need to know how much fat [1] is in milk. It takes time to manually check the fat and amount [3]. Second, some dairy farms in town do not have adequate equipment for analysis. If the milk has been skimmed, it can be tested [5] under these conditions. This may take 1-2 hours. Milk in plastic bottles or bags eventually leads to bad habits. The manual nature of the process that can cause errors is another factor. For farmers, this is the biggest loss. Therefore, to reduce manual labor and obtain better results, the existing system should be replaced with a new system that uses a system that can measure milk samples automatically and inexpensively. As a result, many farmers deliver milk to dairy products. It is the responsibility of the dairy product to determine the quality of each farmer's milk and provide the fare to the farmer. Users also know a variety of milk information using moisture and gas sensors. The development of this system is based on an Arduino controller for detecting milk parameters [2]. parameters include LDR, pH sensor, gas sensor and humidity sensor. The sensor is connected to the Arduino controller. Parameters may be read out and shown on the LCD panel using the software that has been built. This is a low-cost and reliable method of identifying adult milk. Additionally, the dairy business may communicate real-time milk data to the government via the IOT procedure to correct unlawful things like milk quality [1][2][5] during milk production.

II. REVIEW ON AUTOMATIC MILK QUALITY ANALYZING AND BILLING SYSTEM

The following literature survey is carried out with reference to systematic analysis of Automatic Milk Quality Analyzing & Billing System.

A. S. Saravanan, et al. (ICICCS, 2021). "Smart Milk Quality Analysis and Grading Using IoT". [1]

In this Paper, analyzing the milk of each depositor and maintaining the data manually is a huge challenge. The solution to this issue can be found in this notion. Their aim is to develop and put into use a microcontroller-based system for monitoring and assessing milk parameters. pH, CLR, SNF and milk yield are some of the factors. Various sensors are used to measure these variables. To determine milk purity, many dairies rely solely on inaccurate CLR and fat content tests. However, with this concept, the milk may be rated based on any milk parameter value. The cost will be automatically computed when the milk's quality has been determined. The database will then be updated with every aspect of the milk's price. The user may quickly obtain it via the straightforward mobile application whenever they need it. In the future automated world, this method will be highly helpful because it is inexpensive and efficient.

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B. A. Zakeri , et al. (IEEE Access, 2018). "Early Detection System for Proactive Management of Raw Milk Quality: An Australian Case Study".[2]

In this Paper, the authors discussed for assessing and preventing milk with a high microbiological index from migrating farther downstream in a dairy supply chain, existing research takes a reactive stance. They contend that if the goal is to optimize milk life in terms of quality, such an approach is not the best course of action. They suggest a proactive strategy that keeps an eye on the parameters of temperature and level, which serve as the building blocks of the bacteria in milk. The state at which the storage tank should store the milk in compliance with standards is then determined using this information. The real condition of the tank is then compared to this status, and if they differ, it will urge the farmers to take the necessary preventive measures to regulate the quality of the milk. proactive management designed by Raw A rule-based system and machine learning approaches are used to mimic the milk quality approach. degree of precision They use it on milk in order to validate our strategy and show how it may be used. a farm in Australia's Queensland.

C. Shubhangi Verulkar, et al. (JETIR, 2019). "Milk Quality and Quantity Checker". [3]

Authors described an users may verify the quality and amount of milk using an Internet of Things (IoT)-based system. The spread of germs will accelerate, and the milk will have an un-favourable odour if it is kept in storage for a number of days. The health of humans is seriously endangered by these tainted milk-producing bacteria. In order to stop future diseases, society urgently needs milk surveillance. The major goal of this project was to create a sensor-based electrical system for tracking the behaviour of several compounds in milk that can change the qualities of pure milk. Consequently, a monitoring system is required to find and identify milk deterioration. By using a variety of sensors to keep an eye on the milk characteristics, this work illustrates a unique method of milk quality testing.

D. Sumitra Goswami, et al. (IJAEB, 2021). " Arduino-Based Milk Quality Monitoring System". [4]

Authors described the creation and use of an arduino controller-based system for the detection and analysis of milk parameters. The created system is lighter and smaller. It responds swiftly and uses little electricity to operate. It can therefore be used for portable applications. Future efforts will concentrate on raising the system's overall accuracy. It is also feasible to reduce the system's size and increase mobility so that it may be used freely in the field.

E. S. Priya, et al. (IJTRD, 2017)."Milk Quality Tester".[5]

In this Paper, the authors analyzed and delivers a cutting-edge milk quality monitoring system based on Smart Sensor technology. All newborns main source of nutrition is milk, thus it is important to keep an eye on kids' security. The project's primary objective is to create products that assess the safety and quality of milk eaten. In order to determine several milk parameters, this study makes use of clever sensor technologies. To assess the milk's quality, variables including pH and temperature are taken into consideration. To assess if milk is warm or cold, temperature sensors are utilized. To detect the pH of milk, a pH sensor is utilized (that is, whether is acidic, basic or neutral). Milk's protein content is determined using the nitrogen sensor. If melamine is present in milk, it may be found by using the protein content. As a result, each of these sensors is integrated into the housing, and the monitoring indication displays the output outside (LED). Using a Bluetooth gadget, they may transmit a report to your smartphone (about milk quality).

III. COMPARISION OF AUTOMATIC MILK QUALITY ANALYZING AND BILLING SYSTEM

The analysis of the different system parameters is carried out in Table 3.1.

Table 3.1

Author andYear	Title	Remark
S. Saravanan, et al. (ICICCS, 2021). "Smart Milk Quality Analysis and Grading Using IoT".	"Smart Milk Quality Analysis and Grading Using IoT"	The overall consistency of the Future development on the system will be necessary, and efforts should be made to make the gadget more user-friendly. Simple parts including sensors, a Node MCU, and a lactometer are used in the suggested system. These are successfully coupled to handle the automation of the diary.

A. Zakeri , et al. (IEEE Access, 2018). "Early Detection System for Proactive Management of Raw Milk Quality: An Australian Case Study".	"Early Detection System for Proactive Management of Raw Milk Quality: An Australian Case Study"	Based on a responsive approach to quality assessment, it prevents milk with a high bacterial index and a high bacterial content index from going farther downstream in the dairy supply chain. This study argues that it is not the best option. What should it do if it wishes to optimize and slow the life of milk? (i.e) what we created. Early detection system that leverages IoT data to detect milking cycle occurrences.
Shubhangi Verulkar, et al. (JETIR, 2019). "Milk Quality and Quantity Checker".	"Milk Quality and Quantity Checker"	The created system is both smaller and lighter. It boosts a low power consumption and a quick reaction time. As a result, it may be used in mobile apps. Future development will concentrate on enhancing the system's overall accuracy. Additionally, the system may be made more portable (smaller in design) so that it can be freely applied with field operations.
Sumitra Goswami, et al. (IJAEB, 2021). " Arduino-Based Milk Quality Monitoring System".	"Arduino-Based Milk Quality Monitoring System"	An Arduino-based system was designed to assess milk quality and offer faster and more consistent findings than the existing milk quality analysis method. This equipment may serve as the primary milk quality analyzer for all dairy cabin milk dispensers. Alternatively, Bluetooth can be used to check the quality analyzer results on a mobile device. A Bluetooth module is attached to the Arduino controller. Throughout the month, the dairy vendor monitors milk analysis data.
S. Priya, et al. (IJTRD, 2017)."Milk Quality Tester".	"Milk Quality Tester"	Milk testing and quality control are critical components of every milk processing enterprise, whether small, medium, or big. The test is intended to fulfil the chemical composition standards.

IV. CONCLUSION

From analyzing all the above systems, it may be inferred that the primary goal of the study is to determine the fat, MQ135 gas sensor detects ammonia gas, sulphide, benzene series steam, smoke and other dangerous gases well, and humidity value testing of various milk, as well as applying the calculation of quantity per litter and IOT cloud for remote monitoring. The pH of pure milk ranges from 6.7 to 6.9 [1][6]. It is determined by the breed of cow, the season of lactation, and the diet. The fat content in various livestock ranges from 3.0 to 4.0 [1][5][6] percent fat in cow milk and 7-8 percent fat in buffalo milk. Cadmium sulphide is the most prevalent component of LDR. It requires very little power and voltage.

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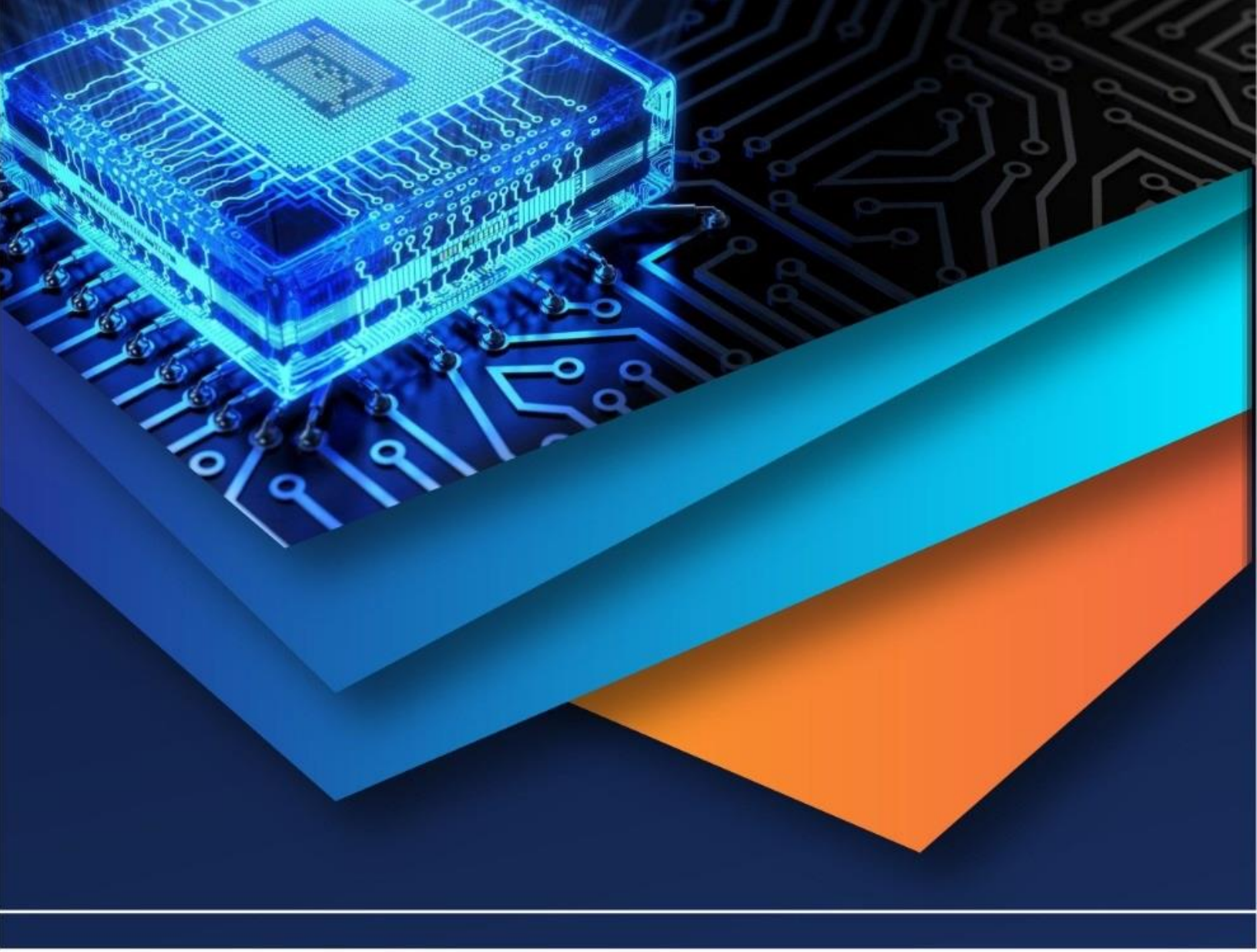
[6] Fat content and fat composition of dairy products - FrieslandCampina InstituteFrieslandCampina Institute



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