



**SILVER OAK
UNIVERSITY**
EDUCATION TO INNOVATION

SILVER OAK UNIVERSITY
SILVER OAK COLLEGE OF ENGINEERING AND TECHNOLOGY
BACHELOR OF TECHNOLOGY
DEPARTMENT OF COMPUTER ENGINEERING

Food Entrepreneurship Surplus milk and Dairy waste

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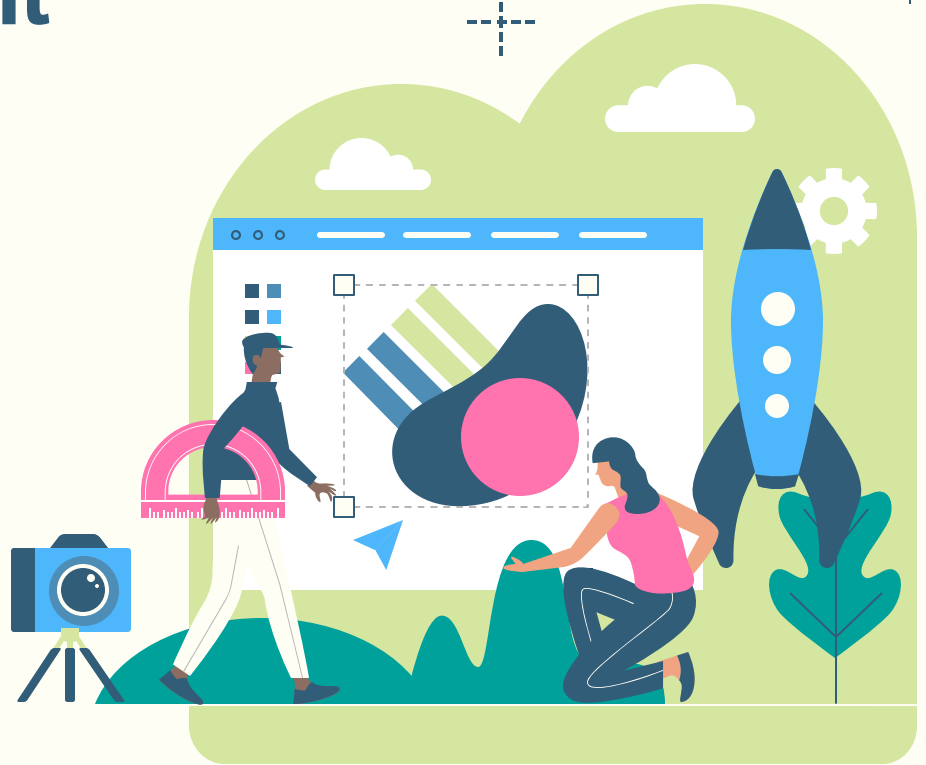
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Table Of Content


- Abstract
- Introduction
- Literature Survey/ Research
- Implementation
- Worked carried out till date
- Future Work & Conclusion
- Timeline Chart
- References





Abstract

The surplus milk and dairy waste problem is a significant challenge in the dairy industry, often leading to economic losses, environmental impact, and food wastage. This project aims to address this issue by converting surplus milk into long shelf-life dairy products, such as UHT milk, milk powder, cheese, butter, and yogurt. This approach reduces waste, improves supply chain efficiency, and provides sustainable, value-added products that meet global demand while minimizing environmental concerns.



Introduction

Surplus milk and dairy waste are significant challenges, causing economic losses and environmental harm.

Overproduction often leads to milk being discarded due to inadequate storage or distribution systems. Converting surplus milk into long shelf-life products like UHT milk, milk powder, cheese, and butter offers a practical solution. Additionally, real-time monitoring using IoT devices during transportation can ensure optimal conditions, reducing spoilage and waste. This project combines value-added dairy product processing and IoT-enabled monitoring to address surplus milk and improve supply chain efficiency.

Literature Survey/Research

1. Surplus Milk and Dairy Waste: Challenges and Causes

- Surplus milk production is often a result of various factors such as overproduction, fluctuating market demand, and inadequate infrastructure for milk collection and storage (Saksena et al., 2020). This surplus leads to wastage, which is especially prevalent in rural areas where milk may spoil before reaching processing plants due to poor refrigeration and transportation systems





2. Long Shelf-Life Dairy Products as a Solution

The conversion of surplus milk into long-shelf-life products is a proven strategy to reduce waste. Processing methods such as **Ultra-High Temperature (UHT) pasteurization**, which extends the shelf life of milk without refrigeration, Dairy products like **cheese** and **butter**, which require minimal preservation and have a naturally long shelf life, also offer sustainable solutions to surplus milk issues

3. Real-Time Monitoring of Milk Transportation Using IoT

IoT devices have become key tools in optimizing milk transportation by monitoring temperature, humidity, and location in real-time. These devices help maintain milk quality during transit and minimize spoilage. These systems can alert stakeholders to deviations, further preventing potential losses



Implementation

Product Selection and Research:

- **Identify suitable products:** Select the long-shelf-life dairy products to be produced, such as UHT milk, powdered milk, cheese, butter, or ghee.
- **Study processing techniques:** Research and select the most appropriate processing methods for each product, such as UHT pasteurization, spray drying for milk powder, or traditional cheese-making methods.

derived from surplus milk, including lactose-free products, protein concentrates, and bioactive compounds. The demand for diverse dairy products continues to increase, presenting opportunities for business growth and sustainability.





Setting Up Processing Units:

- **Equipment acquisition:** Invest in necessary machinery, such as UHT pasteurizers, spray dryers, cheese vats, and butter churners.
- **Quality control:** Implement systems to ensure that each product meets safety and quality standards

Packaging and Storage:

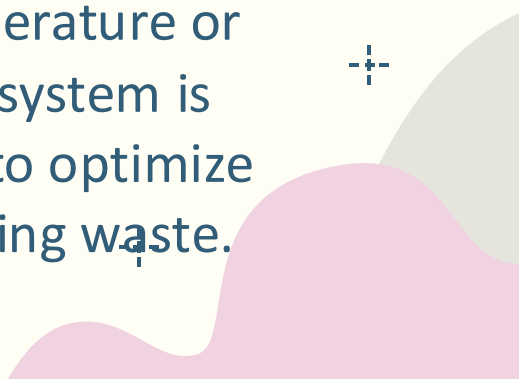
- **Packaging for long shelf-life:** Use appropriate packaging materials (e.g., tetra packs for UHT milk, vacuum-sealed packs for cheese) to prevent contamination and preserve freshness.
- **Storage conditions:** Set up suitable storage facilities to ensure products remain fresh and meet their shelf-life requirements.





Real-Time Monitoring Using IoT Devices During Milk Transportation

IoT devices like temperature, humidity, and GPS sensors are installed on milk containers or transport vehicles to monitor conditions in real time. The data is transmitted to a cloud-based platform, which alerts stakeholders if any parameters fall outside the acceptable range. This enables quick corrective actions, such as adjusting temperature or rerouting shipments, to prevent spoilage. The system is integrated with existing supply chain processes to optimize milk transportation, ensuring quality and reducing waste.





Proposed Work

The proposed work aims to address surplus milk and dairy waste by converting surplus milk into long-shelf-life products like UHT milk, milk powder, cheese, and butter. This will involve setting up processing lines and quality control measures.

- Additionally, IoT-based real-time monitoring will be implemented to track temperature, humidity, and location during milk transportation. Sensors will send data to a cloud platform, triggering alerts if conditions deviate from optimal ranges, ensuring quick corrective actions. This system will be integrated with existing supply chain processes for enhanced efficiency

Diagram



Work carried out till date

TASK	STATUS	COMPLETION DATE
PROJECT PLANNING	COMPLETED	JULY-2024
RESEARCH	COMPLETED	AUG-2024
LITERATURE REVIEW	COMPLETED	AUG-2024
PROPOSED WORK	COMPLETED	SEPT-2024
REAL TIME MONITORING SYSTEMUS USING IOT	IN PROGRESS	SEPT-2024

Timeline Chart

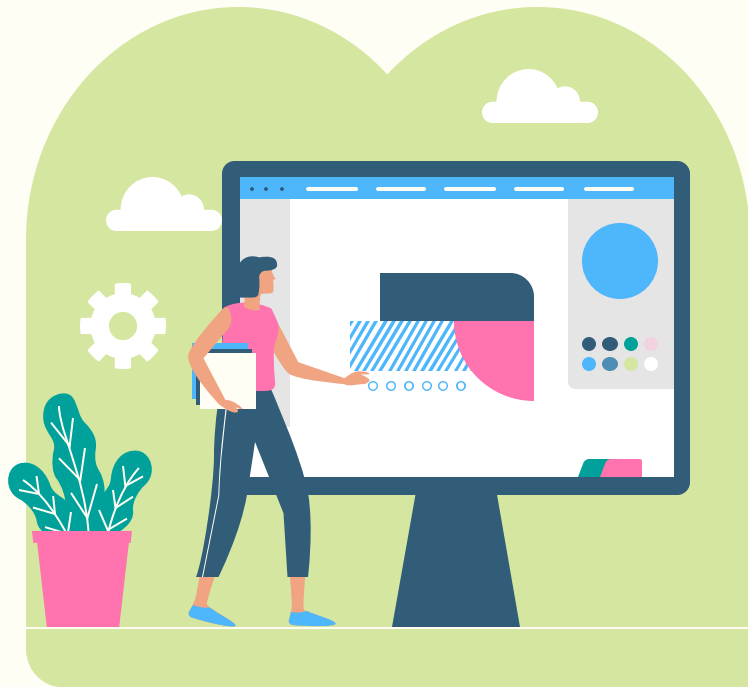




Conclusion

This project offers a sustainable solution to surplus milk and dairy waste by converting excess milk into long-shelf-life products, such as UHT milk, milk powder, cheese, and butter. Additionally, integrating IoT-based real-time monitoring during milk transportation ensures optimal conditions, reducing spoilage and waste. By improving the efficiency of the dairy supply chain and minimizing environmental impact, the project provides a practical approach to tackling the challenges of surplus milk, enhancing product availability, and promoting sustainability in the dairy industry.





Thank you