NEW PRODUCT FROM REDUCING THE AMOUNT OF WASTE FROM THE PRODUCTION PROCESS USING THE LEAN CONCEPT

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ABSTRACT

The objective of this research is to create added value from leftover waste by producing new products within the community enterprise group to meet customer demand. The aim is to address the problem, and find ways to dispose of and manage the leftover waste. It is one method that can reduce the amount of waste left over from the production process, thereby reducing various pollutants according to the concept of lean concept.

This research reduce the amount of waste left over from the production process. Initially, there were 50 grams of lingzhi mushroom residue left over and the waste from discarding lingzhi mushroom residue is valued at 45 baht. After applying the lean concept to the production process, it was possible to reduce the amount of leftover lingzhi mushroom residue and It is possible to reduce waste from discarding lingzhi mushroom stems. The percentage reduction that can be achieved is calculated to be 100% because the leftover lingzhi mushroom residue can be used as raw materials to create a new product (Soft scrub soap) which meets current customer preferences for herbal soap.

Keywords: Lean , Herbal soap , Reduce waste

INTRODUCTION

Lean and 7 waste reduction are popular methods for reducing waste or cutting costs from waiting in the production process. For example, Niyomrat R. et al. (2021), Kuanmuang S. et al. (2022) and Niyomrat R. et al. (2022) research using the Why-Why Analysis technique to identify problem-solving methods with the 5W-1H technique, adjusting processes according to the PDCA principle to solve problems by reducing waste according to the 7 waste reduction concepts. And SWOT analysis and develop products are popular methods for improving business. For example, Aphibunyopas J. et al. (2020) conducting a SWOT analysis combined with a business model analysis, strategic recommendations and key factors for business operation can be proposed. Training programs can be designed to provide knowledge on business operations, product development, and expanding distribution channels both online and offline. This would enable members of the community enterprise to enhance their business management skills and competitiveness.

Currently, consumers prefer to use herbal-infused soap widely. Because consumers are concerned about their health. To emphasize and highlight the benefits of Thai herbs more. Lingzhi mushroom soap is a beneficial soap. The community enterprise group specializing in mushroom cultivation and processing in Ban Chiang sees the benefits of lingzhi mushrooms. They process lingzhi mushrooms into products to meet customer needs. In the soap production process, Lingzhi mushrooms leftover from the production process are discarded without being utilized effectively, resulting in wastage. This research reduce waste from the production process by Lean concept.

OBJECTIVE

1. To study the production process of lingzhi mushroom soap.
2. To develop a new product by reducing waste from the production process using the lean concept.

LITERATURE REVIEW

1. Observation Theory

This research applied the theory of observation by learning about the production process of soft scrub soap to understand how it is manufactured and identify points that lead to waste.

2. Lean

Applying lean concepts to reduce production costs by minimizing waste, such as the leftover lingzhi mushrooms from the boiling process. By reducing waste through drying the leftover lingzhi mushrooms. And then grinding them to use as raw materials for making lingzhi mushroom soap. Help reduce waste from the production process to zero.

3. Theory of 7 wastes

The waste that needs to be disposed of by the community enterprise group in Baan Chiang is excessive waste. This leads to unnecessary costs, which are production costs resulting from discarding lingzhi mushrooms.

METHODOLOGY

This research is Quantitative research. Target group and collaborating organizations as follow :

- Target group : Community enterprise group for mushroom cultivation and processing, Ban Chiang.
- Stakeholders : 20 members of the Ban Chiang community enterprise group.

The methodology of the research

1. Conduct on-site surveys meeting for interviews to study relevant data :
   - Study the operation processes of machinery and personnel.
   - Identify problems occurring in the production process.
2. Decision-making tools for problem-solving :
   - After discovering the issues and studying related matters, tools such as Lean and 7 Wastes are applied to address the problem by reducing waste generated from production processes.
   - Utilize SWOT Analysis tool to identify problems.
3. Before and after comparison after implementing the tools : experiment, evaluate, and solve problems.

RESULTS

The results obtained from the analysis of the internal and external environment (SWOT) of the community enterprise group for mushroom cultivation and processing in Baan Chiang are as follows :

- Strength

1. Price competitiveness in the market.
2. Majority of raw materials are self-grown.

3. Proactive customer service through Sales Report.
4. Ability to offer credit to customers.
5. Multi-channel customer feedback system.

- Weakness

1. Members of the group have regular jobs.
2. High production costs.

- Opportunity

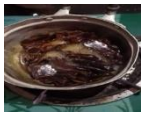
1. Close proximity to the community.
2. Government agencies provide support.
3. Availability of sales outlets.

- Threat

1. Intense competition in the industry.
2. High price competition.

The process before improvement show in table 1.

Table 1 The process before improvement

Process before improvement	**Picture of Process**	**Process before improvement**	**Picture of Process**
1. Preparation of raw materials for boiling lingzhi mushrooms.		8. The process of adding various ingredients into the dissolved glycerin.	
2. The process of boiling lingzhi mushrooms.		9. The process of pouring the soap mixture into silicone soap molds.	
3. The process of filtering lingzhi mushroom through a sieve to separate the liquid and mushroom residue.		10. The process of waiting for the soap to harden.	
4. Preparing ingredients for making lingzhi mushroom soap before improvement.		11. The process of removing the soap bars from the molds.	
5. Transparent glycerin used in lingzhi mushroom soap production.		12. The process of wrapping the soap in clear plastic to prevent contamination.	
6. Cutting and dividing glycerin for melting before improvement.		13. Lingzhi mushroom soap before improvement.	
7. Boiling glycerin to dissolve it.		14. Lingzhi mushroom soap from the community enterprise group before improvement.	

The process after improvement show in table 2.

Table 2 The process after improvement

Process before improvement	Picture of Process	Process before improvement	Picture of Process
1. Preparation of raw materials for boiling lingzhi mushrooms.		3. The process of filtering lingzhi mushroom through a sieve to separate the liquid and mushroom residue.	
2. The process of boiling lingzhi mushrooms.		4. The process of sun-drying lingzhi mushroom residue.	
5. The process of grinding dried lingzhi mushroom residue.		12. The process of pouring the soap mixture into silicone soap molds.	
6. Finely ground lingzhi mushroom.		13. The process of waiting for the soap to harden.	
7. Preparing ingredients for making lingzhi mushroom soap after improvement.		14. The process of removing the soap bars from the molds.	
8. Transparent glycerin used in lingzhi mushroom soap production.		15. The process of wrapping the soap in clear plastic to prevent contamination.	
9. Cutting and dividing glycerin for melting after improvement.		16. Lingzhi mushroom soap after improvement.	
10. Boiling glycerin to dissolve it.		17. The process of putting soap into packaging and applying labels.	
11. The process of adding various ingredients into the dissolved glycerin.		18. Lingzhi mushroom soft scrub soap by the community enterprise group.	

Lingzhi mushroom residue, which is the leftover part from the boiling process of Lingzhi mushrooms, is dried, ground into powder, and used as an ingredient in the soft scrub soap formula. This formula is a newly improved version derived from the original recipe, aiming to reduce waste generated during the production process and minimize the disposal of raw material residues from the production process, making it more beneficial to the environment.

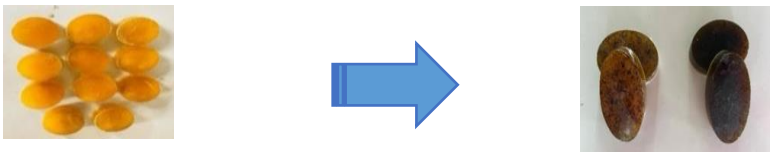
Summary of results after applying the principles of reducing waste in the production process and increasing product value to solve the problems in this research. The results obtained from the application are as follows.

The lingzhi mushroom soft scrub soap that has lingzhi mushroom powder in the soap, which will help scrub the face clean and make the skin soft and moisturized.

Table 3 Comparison of waste generated from the production process.

Waste generated from the production process	Waste generated before improvement	Waste generated after improvement	Percentage of waste reduction
Lingzhi mushroom residue leftover	50 grams	0 grams	100%
The waste from discarding lingzhi mushroom residue	45 baht	0 baht	100%

From the table 3 comparison of waste generated from the production process. This research reduce the amount of waste left over from the production process. Initially, there were 50 grams of lingzhi mushroom residue left over and the waste from discarding lingzhi mushroom residue is valued at 45 baht.



Soft scrub soap formula before improvement. Soft scrub soap formula after improvement.

Figure 1 comparison of the product before and after improvement

Reducing waste generated from the production process, which includes Lingzhi mushroom residue leftover from the boiling process, involves drying and grinding it into powder to be used as an ingredient in the soft scrub soap formula. This formula is a newly improved version derived from the original recipe, aiming to minimize waste generated during production and reduce the disposal of raw material residues from the production process, thereby benefiting the environment. which is consistent with Niyomrat R. et al. (2022) research study was conducted to increase the production efficiency of coconut sugar using the Why-Why Analysis technique to identify problem areas and employing the 5W-1H technique to find solutions. The study also involved adjusting processes according to the PDCA (Plan-Do-Check-Action) principle to address issues and reduce waste following the 7 types of waste concept. The results of the study revealed improvements in production efficiency in three main areas: production processes, safety measures, and product quality management, aligning with the principles of production management.

CONCLUSION

From studying and analyzing the production processes of products from community enterprise groups, efforts were made to reduce waste generated during the production process. After applying the lean concept to the production process, it was possible to reduce the amount of leftover lingzhi mushroom residue and It is possible to reduce waste from discarding lingzhi mushroom stems. The percentage reduction that can be achieved is calculated to be 100%

because the leftover lingzhi mushroom residue can be used as raw materials to create a new product (Soft scrub soap) that meets current customer preferences for herbal soap.

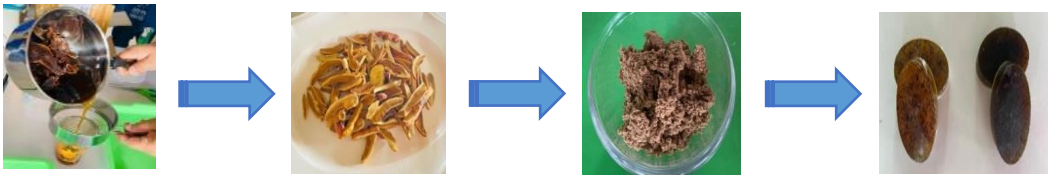


Figure 2 The product after applying the lean concept

ACKNOWLEDGEMENTS

As a researcher, I would like to sincerely express my gratitude to my research advisor for dedicating their personal time to provide guidance and full support throughout this research project. Thank you very much.

As a researcher, I would like to sincerely thank the Language Institute of Rajabhat Suan Sunandha Rajabhat University for their assistance with various matters such as documents, forms, and more. Thank you for taking care of me throughout. I am deeply grateful.

As a researcher and student at Suan Sunandha Rajabhat University who received funding to present international research this time. I would like to sincerely thank the Research Institute and Suan Sunandha Rajabhat University for giving me this opportunity. Even though I study at the campus learning center I am grateful to have the opportunity to receive equal scholarships. thank you very much

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