



# Analysis of Chemical Composition of Raw Cow's Milk Produced by Maejo Dairy Cooperative Ltd. in the Year of 2024



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## ABSTRACT

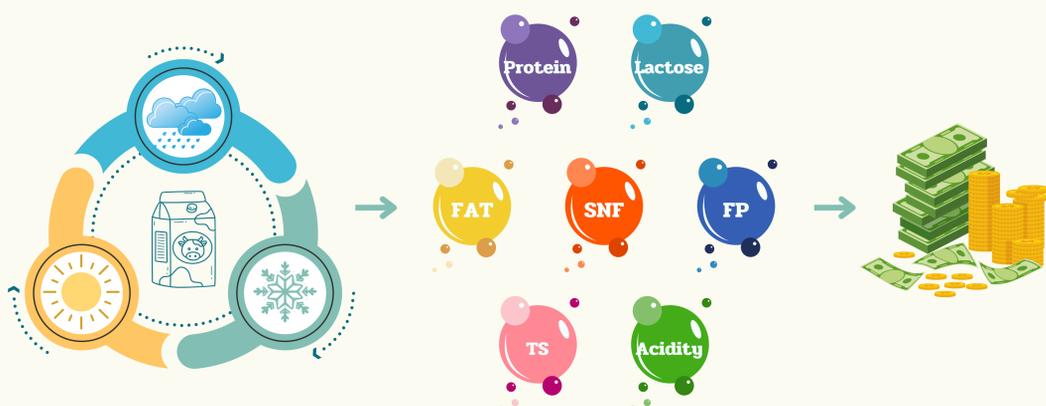
Thailand is one of the countries with widespread dairy farming, especially the northern region, Chiang Mai, where dairy farming has been increasing every year. Seasonal changes in Thailand and external factors such as temperature and rainfall could however influence the chemical composition and quality of raw milk, such as fat, protein, and lactose contents. These components also affect milk pricing, as well as the production process of dairy products, which could have an effect on consumer satisfaction.

This research aimed to investigate the changes of chemical composition of raw cow's milk produced by Maejo Dairy Cooperative Ltd. during the summer, rainy, and winter seasons in the year of 2024. The results of chemical composition on average of raw milk in 3 seasons indicated that the contents of fat were between  $3.99 \pm 0.16$  and  $4.14 \pm 0.22\%$  (w/w), the contents of protein were between  $2.96 \pm 0.05$  and  $3.00 \pm 0.04\%$  (w/w), the contents of lactose were between  $4.40 \pm 0.04$  and  $4.43 \pm 0.02\%$  (w/w), the contents of total solids were between  $12.40 \pm 0.16$  and  $12.48 \pm 0.20\%$  (w/w), the contents of solids non fat were between  $8.40 \pm 0.08$  and  $8.41 \pm 0.05\%$  (w/w), the values of freezing point were between  $-0.526 \pm 0.006$  and  $-0.521 \pm 0.003^\circ\text{C}$  and the acidity was of  $0.16 \pm 0.00\%$  as lactic acid.

It can be concluded that seasonal changes could have a great impact on the chemical composition of raw milk as the rainy season was the highest, followed by the winter and the summer, respectively. The contents of fat, protein, lactose, total solids, and the values of freezing point were significantly different ( $p \leq 0.05$ ). It is predicted that the obtained results can be applied to related works and help farmers in the cooperative improve their cattle raising process to increase the efficiency of milk production with better nutritional quality.

## INTRODUCTION

Cow's milk provides essential nutrients for human growth. Assessing its chemical composition such as fat, protein, lactose, total solids, solids non fat, freezing point, and acidity. It is crucial for quality control, detecting water adulteration, and microbial contamination. Furthermore, fat, solids non-fat, and freezing points also influence raw milk pricing. In Chiang Mai, dairy farming is expanding. However, Thailand's seasonal climate affects milk composition and quality.



## OBJECTIVES

- To analyze the changes of chemical composition of raw cow's milk in each season
- To obtain information that can be used to improve dairy farming

## METHODOLOGY



## RESULTS & DISCUSSION

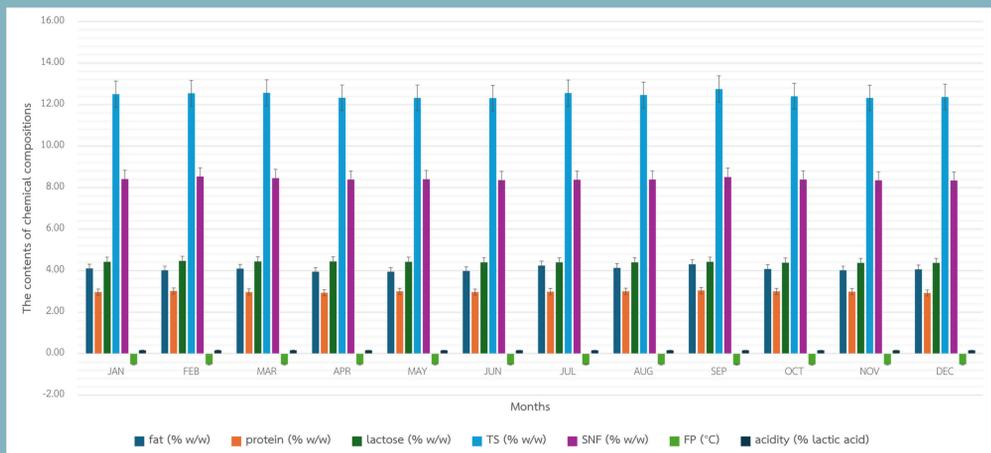


Figure 1 Average chemical composition of milk for each month in 2024.

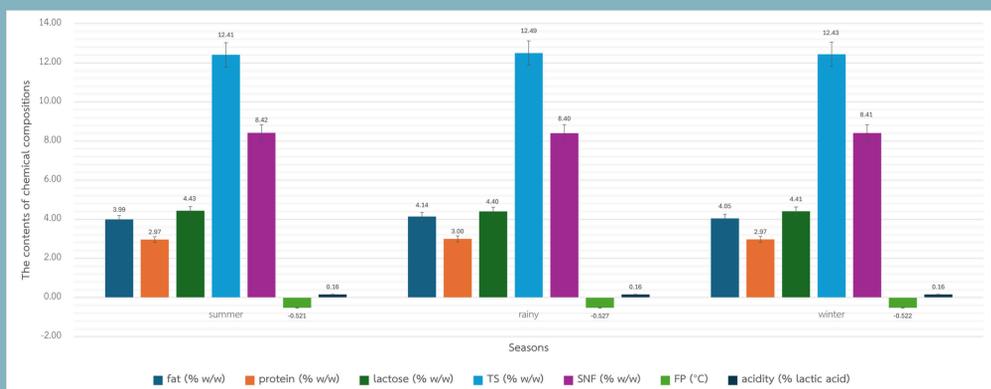


Figure 2 Average chemical composition of milk by season in Thailand 2024.

## CONCLUSIONS

- Seasons in Thailand affect the chemical composition of milk, especially in the rainy season, which results in the highest contents, the next order is winter, and the lowest is summer.
- It is expected that the results of this research can be applied to related work and help farmers improve their cattle raising processes.

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## ACKNOWLEDGEMENTS

- Division of Biochemistry and Biochemical Innovation, Department of Chemistry, Faculty of Science, Chiang Mai University.
- Dairy Farming Promotion Organization of Thailand, DPO Office Upper Northern Region (Chiang Mai Dairy Factory)

