



# **INFLUENCE OF STORAGE CONDITIONS ON ORGANIC ACID PROFILES IN COTTAGE CHEESE**

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# INTRODUCTION

## ❖ Cottage Cheese

- Soft
- uncured
- mild flavored

## ❖ Organic acids

- influence organoleptic properties
- microbial culture stabilization
- important in determining spoilage
- shelf life of cottage cheese

# AIMS AND OBJECTIVES

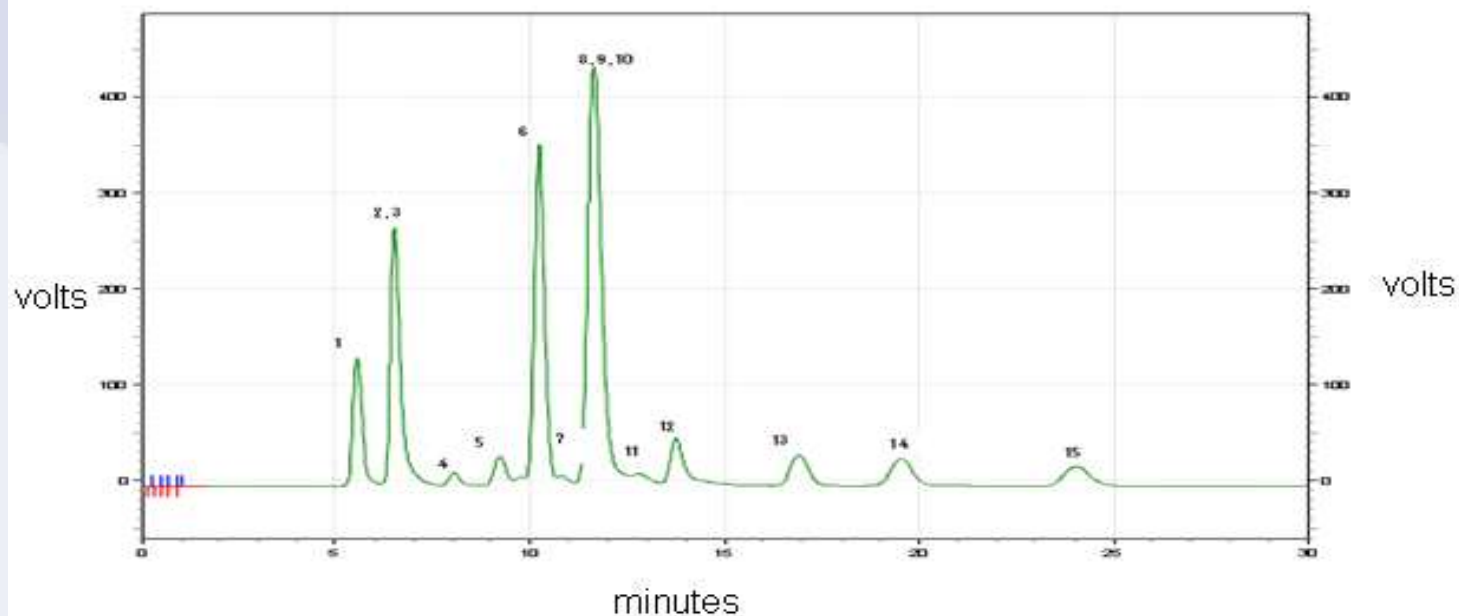
- ❖ **Identify and quantify OA in cottage cheese**
- ❖ **Identify OA that can be used as markers to determine spoilage in cottage cheese**
- ❖ **Determine the shelf life of unrefrigerated cottage cheese**

# MATERIALS AND METHODS

- ❖ **Samples were collected from a local dairy plant from week one to week six**
- ❖ **OA were extracted using Bouzas *et al* method**
- ❖ **OA were analyzed using ion exchange HPLC**
- ❖ **OA standards were used to compare and identify the samples**



# RESULTS AND DISCUSSION

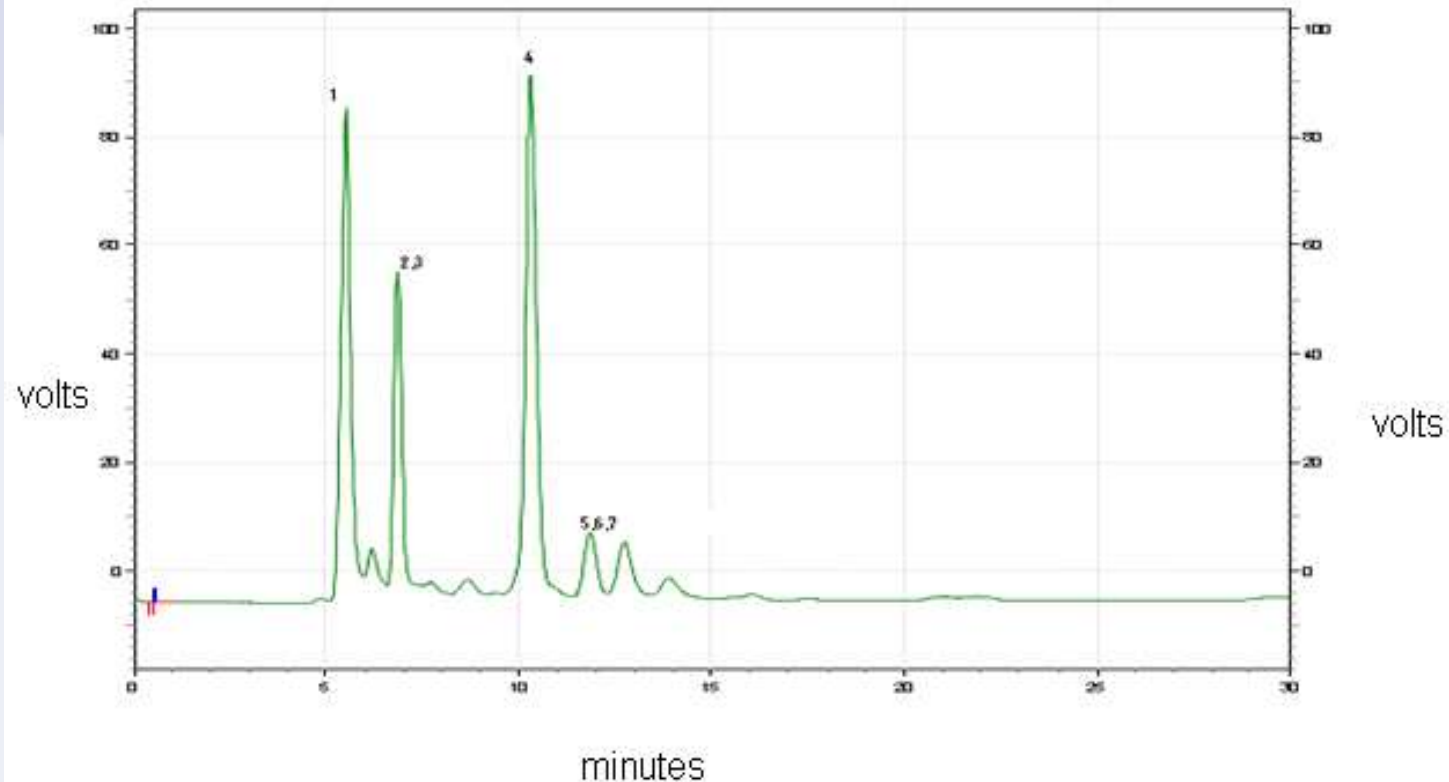


**Fig 1: The Chromatogram showing the mixture of organic acid standards detected at 210 and 290 nm, 1. Oxalic acid; 2. Orotic acid; 3. Citric acid; 4. Malic acid; 5. Succinic acid; 6. Lactic acid; 7. Formic acid; 8. Acetic acid; 9. Fumaric acid; 10. Uric acid; 11. Propionic acid; 12. Hippuric acid; 13. N-Butyric acid; 14. Iso-valeric acid; 15. Valeric acid.**



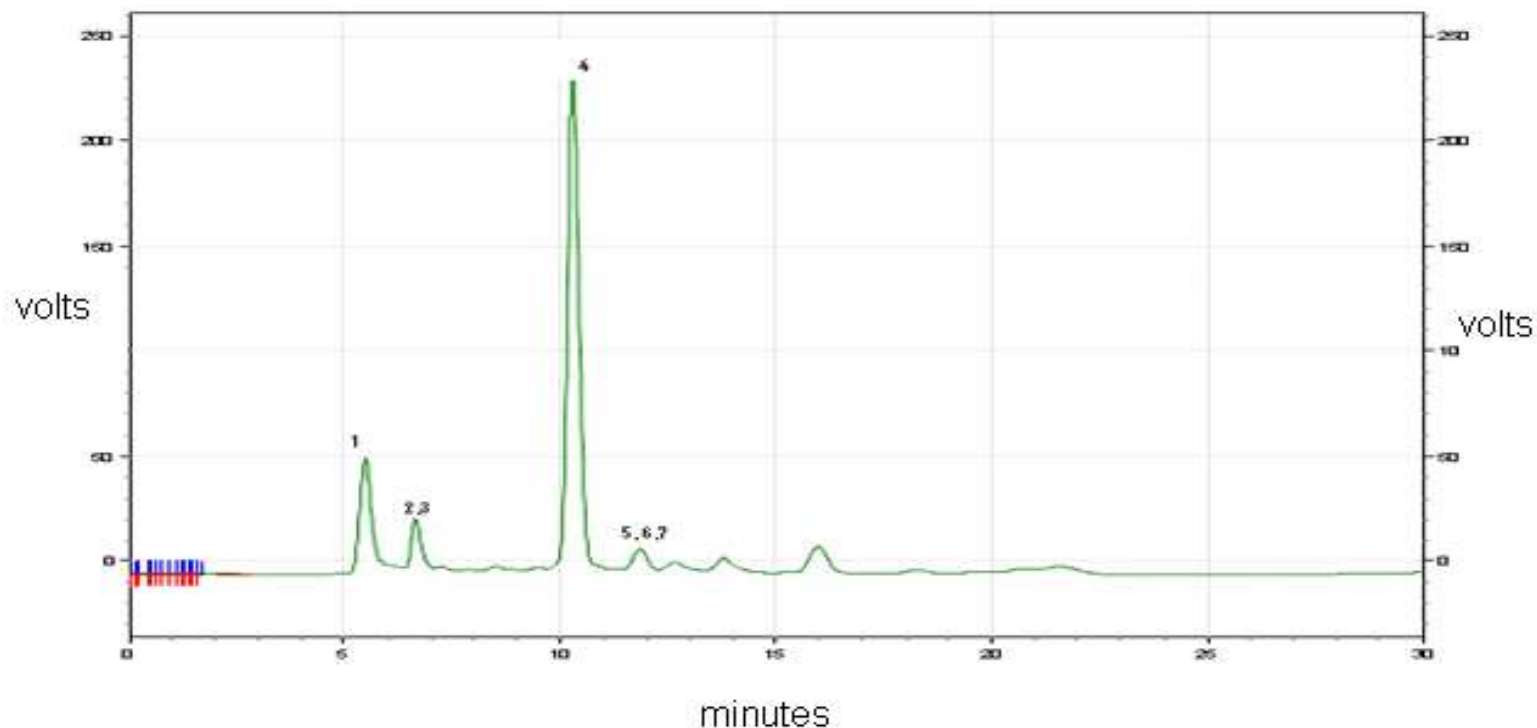
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# RESULTS AND DISCUSSION



**Fig 2: Chromatogram of Cottage cheese fresh from the factory on the first week of analysis detected at a wavelength at 210 and 290 nm: 1. Oxalic acid; 2. Orotic acid; 3. Citric acid; 4; Lactic acid; 5. Acetic acid; 6. Fumaric acid; 7. Uric acid**

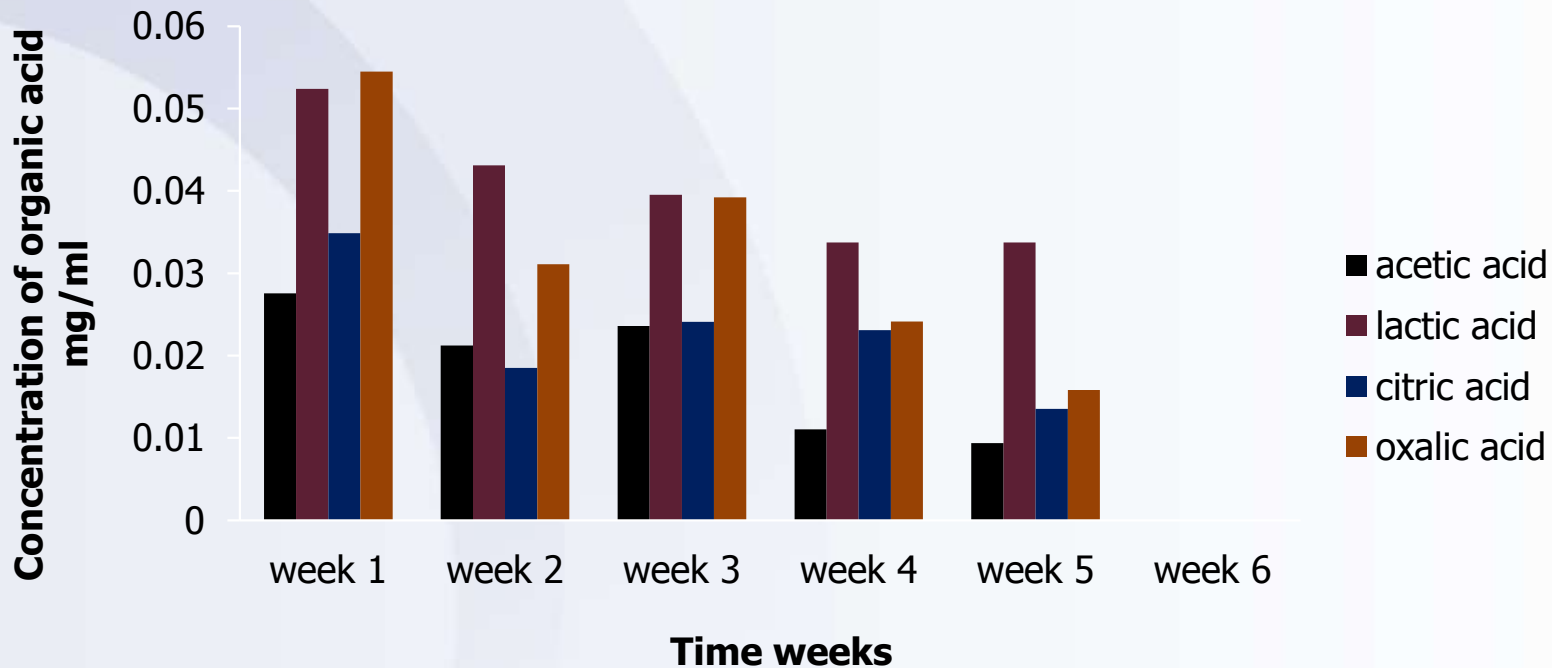
# RESULTS AND DISCUSSION



**Fig 3: Chromatogram of cottage cheese kept for six weeks at room temperature detected at a wavelength of 210 and 290 nm: 1. Oxalic acid; 2. Orotic acid; 3. Citric acid; 4. Lactic acid; 5. Acetic acid; 6. Fumaric acid; 7. Uric acid**

# RESULTS AND DISCUSSION

## Organic acid concentration in cottage cheese fresh from the factory

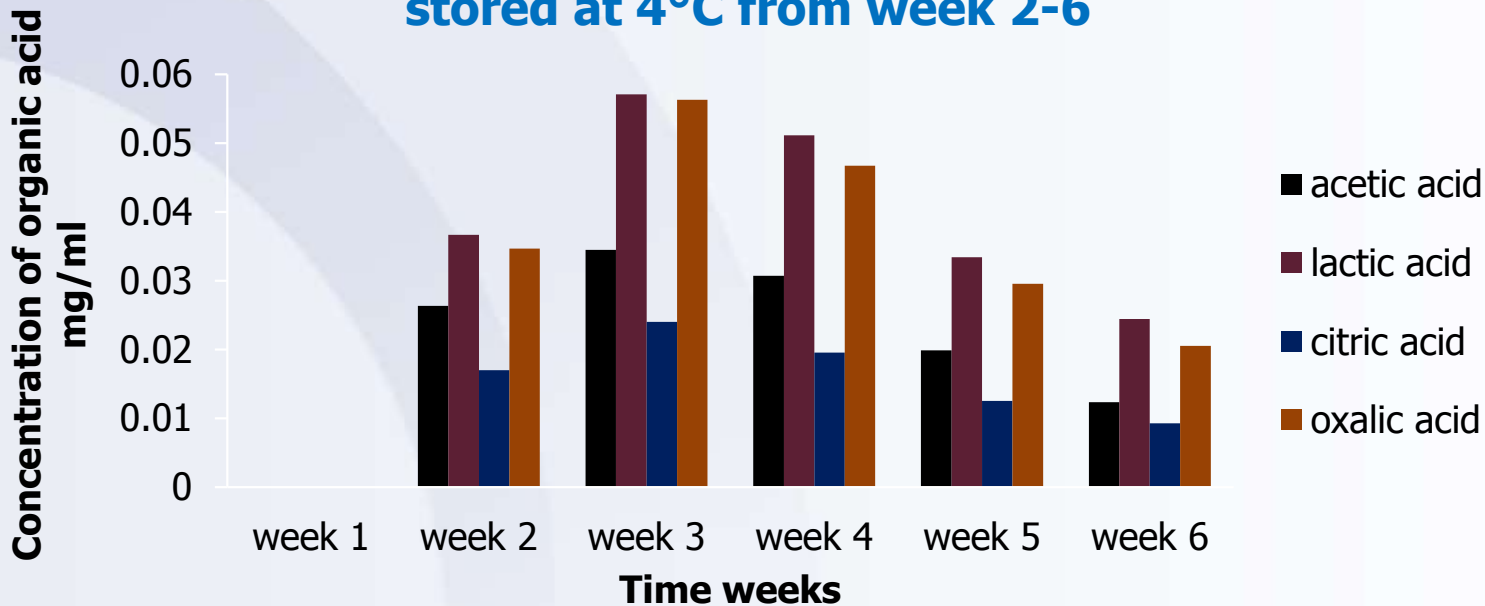


**Fig 4: Organic acids concentration in cottage cheese from the factory.**



# RESULTS AND DISCUSSION

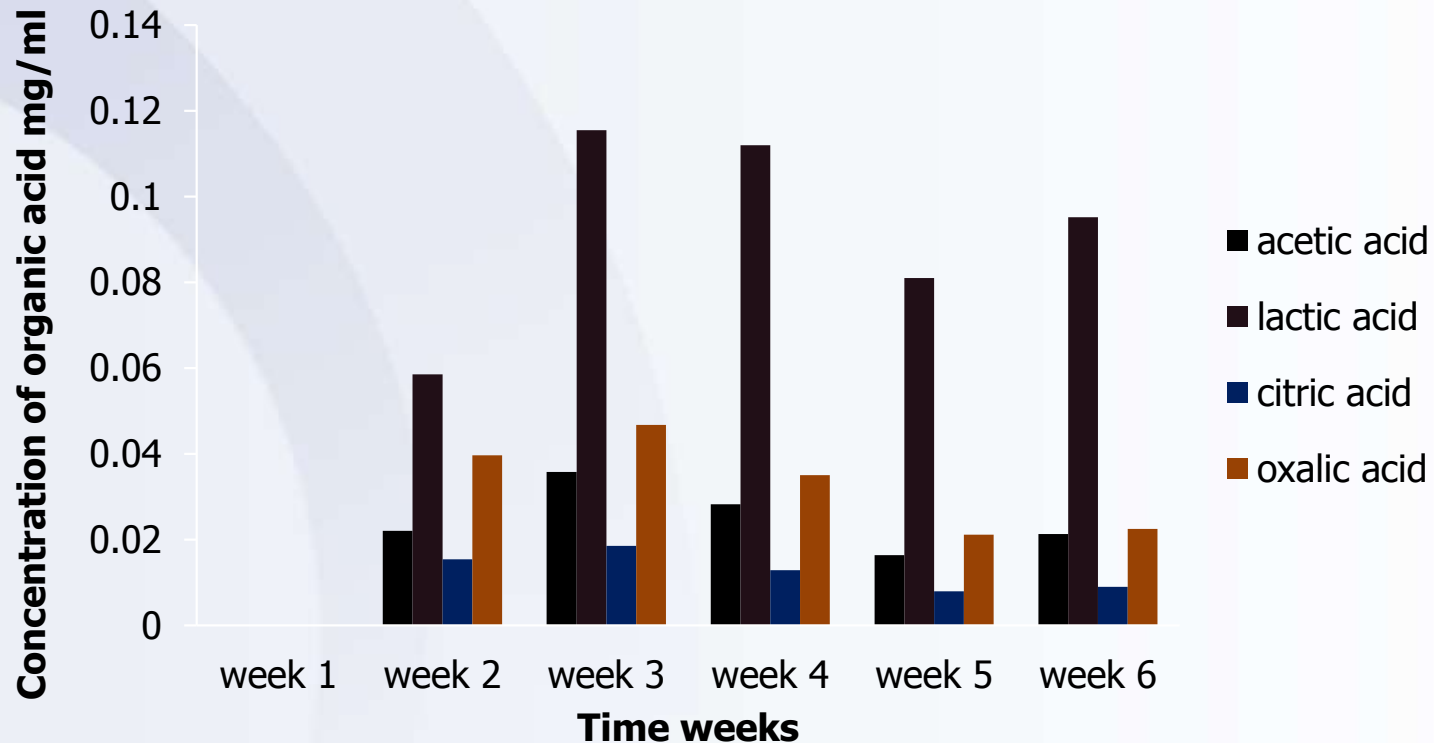
## Organic acid concentration in cottage cheese stored at 4°C from week 2-6



**Fig 5: The organic acid concentration in cottage cheese stored in the refrigerator at 4 °C**

# RESULTS AND DISCUSSION

## Organic acid concentration in cottage cheese stored at room temperature (27°C)



**Fig 6: Organic acid concentrations in cottage cheese stored at room temperature (27°C)**

# CONCLUSIONS

- ❖ **Keeping cottage cheese under 4°C proved to be an effective way of preserving cottage cheese for the six weeks they were studied**
- ❖ **Generally cottage cheese can be stored for two weeks at room temperatures without major changes in OA levels**
- ❖ **Lactic acid concentrations may be utilized as indicator of freshness of cottage cheese**
- ❖ **Levels of the 11 OA may be used to indentify freshly prepared cottage cheese by means of unique “fingerprints”**



# ACKNOWLEDGEMENTS



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