PHYSIOCHEMICAL & MICROBIOLOGICAL PROPERTIES OF SALT ADDED CREAM CHEESE PREPARED USING NATURAL COW MILK IN

SRI LANKA

BY

T.L.D.M.R. WEERASOORIYA



DEPARTMENT OF BIO SYSTEM TECHNOLOGY,

FACULTY OF TECHNOLOGY, EASTERN UNIVERSITY,

SRI LANKA

2023

ABSTRACT

Cheese is a dairy product composed of mainly milk fat and other minor components such as, water, vitamins, enzymes and minerals with the best nutritional value and health care function, and it is very popular in many countries in the world with good taste and diverse taste. Consequently, this present study aimed to investigate the chemical, physical, microbial, sensory properties and shelf life of cheese incorporated with different concentration of salt like %(v/v), 0.5% (v/v), 1% (v/v), and 2% (v/v). Cheese samples were analysed for physicochemical and sensory properties during refrigerated storage at 4 °C. The physicochemical (moisture, fat, titratable acidity, pH), microbial and sensory characteristics (texture, taste, mouth feel, after teste, appearance, colour, aroma and overall acceptability) were analysed, at day 01, day 07, day 14, day 21 and day 28 of storage.

During storage, pH was significantly (p<0.05) decreased. Titratable acidity and total solids were increased with the storage period. Further, fat and moisture content were significantly (p<0.05) decreased. Sensory properties were evaluated through the panel of 30 members. Results of sensory properties revealed that 2.0 % (v/v) of salt added cream cheese had the highest mean score of overall quality of all sensorial properties including texture, taste, mouth feel, after teste, appearance, colour, aroma and overall acceptability. Most of the panelist accepted cream cheese made from 2.0 % (v/v) of salt added cheese than other types of cheese. Finally, it could be concluded that the salted cream cheese manufacturing and it is very much important in the improvement of human nutrition and elevating healthcare.

CONTENT

ACKNOWLEDGEMENT
ABSTRACTiv
CONTENTv
LIST OF FIGURES x
LIST OF TABLES xi
LIST OF ABBREVIATIONS
CHAPTER 01 INTRODUCTION
1.1 Introduction
1.2 Objectives
CHAPTER 02 LITERATURE REVIEW 5
2.1 Milk
2.2 Current States of Dairy in Sri Lanka
2.3 Important of milk in nutrition
2.4 Composition of milk
Source: ('Dairy processing handbook',)7
2.4.1 Water
2.4.2 Fat
2.4.3 Proteins
2.4.4 Lactose

2.4.5 Vitamins
2.4.6 Solid Non Fat (SNF) 11
2.4.7 Total solids (TS) 11
2.5 Cheese
2.5.1 Definition
2.5.2 Background of cheese
2.5.3 Basic steps of cheese manufacture
2.6 Consumption of Cheese
2.7 Composition of cheese
2.8 Cream cheese
2.8.1 Cream cheese varieties
2.8.2 Ingredients of Cream cheese
2.8.3 Cream cheese manufacture
2.8.4 Selection, standardization of the milk
2.8.5 Pasteurization of milk
2.8.6 Acidification
2.8.7 Rennet
2.8.8 Coagulation
2.8.9 Dehydration and forming of the curd
2.8.10 Salting
2.8.11 Ripening
2.9 Overview on Cream cheese

2.10 Health benefits of Cream cheese
2.10.1 Good source of vitamin A
2.10.2 Supplies antioxidants
2.10.3 Low in lactose
CHAPTER 03 METHODOLOGY
3.1 Location and study area
3.2 Materials
3.3 Treatment framework
3.4 Milk analysis
3.4.1 Organoleptic Test
3.4.2 The Alcohol Test
3.4.3 Clot on Boiling (C.O.B) Test
3.4.4 Acidity Test
3.4.5 Resazurin test
3.4.6 Determination of milk density
3.4.7 Alkaline test of milk
3.4.8 Sugar test of milk
3.4.9 Salt test of milk
3.4.10 Starch test of milk
3.4.11 Dextrose test of milk
3.4.12 Urea test of milk
3.5 Cream cheese production step

3.6 Nutritional analysis
3.6.1 Determination of moisture content of Cream cheese
3.6.2 Determination of pH value
3.6.3 Determination of Fat content
3.6.4 Determination of Titratable Acidity
3.7 Microbial analysis
3.7.1 Total colony count
3.7.2 Yeast/ Mold count
3.8 Sensory Analysis
3.9 Statistical Analysis
CHAPTER 04 RESULTS AND DISCUSION
4.1 Chemical attributes of fresh milk
4.1 pH value and Titratable Acidity variation in Cheese during the Storage Period
4.1.1 pH value
4.1.1 pH value 32 4.1.2 Titratable Acidity 33
4.1.1 pH value324.1.2 Titratable Acidity334.2 Fat content variation in Cheese during the Storage Period34
4.1.1 pH value324.1.2 Titratable Acidity334.2 Fat content variation in Cheese during the Storage Period344.3 Moisture content and Total Solid in cheese during storage period36
4.1.1 pH value324.1.2 Titratable Acidity334.2 Fat content variation in Cheese during the Storage Period344.3 Moisture content and Total Solid in cheese during storage period364.3.1 Moisture content36

4.5 Sensory Evaluation
4.5.1 Sensory Attributes Variation during the Day one
4.5.2 Sensory Attributes Variation during the Day Twenty-eight 40
4.5.3 Sensory Attributes Variation Market Sample VS. PDIL (2% salt added
cheese) Sample
CHAPTER 05 CONCLUSIONS AND SUGGESTIONS
5.1 Conclusion
5.2 SUGGESTIONS
REFRENCES 06

LIST OF FIGURES

Figure 2.1: Protein chain with peptide bond
Figure 2.2: Casein micelle
Figure 2.3: Lactose
Figure 2.4: Cream cheese manufacturing process
Figure 3.1: Standard colour chart of Resaurin test
Figure 3.2: Cream Cheese production step
Figure 3.3: Moisture meter
Figure 3.4: Sensory Evaluation at PDIL
Figure 4.1: Sensory Attribute during the Day one
Figure 4.2: Sensory Attribute during the Day twenty-eight

LIST OF TABLES

10.00			78.7	-
\mathbf{P}	10	an		0
	а	20	TA	U

Table 2.1: Top milk producing countries
Table 2.2: Current Status of Dairy in Sri Lanka 6
Table 2.3:Composition of milk from different types of animals 7
Table 2.4: Moisture content and Milk fat content of different types of cheese
Table 2.5: Approximate Composition of branded cheese
Table 2.6: Nutrient composition on Cream cheese according to USDA Classification .21
Table 3. 1Standard colour grades of Rsazurin test
Table 4.1 The quantitative and qualitative analysis of the cow milk used for cream
cheese
Table 4. 2 Changes in pH value and Acidity of the Cheese Prepared under Different
Treatments
Table 4. 3 Changes in Fat content percentage of the Cheese Prepared under Different
Treatments
Table 4. 4 Changes in Moisture content percentage and Total solid percentage of the
Cheese Prepared under Different Treatments
Table 4. 5 Changes in Microbial activity of the Cheese Prepared under Different
Treatments