

**CHANGES THAT OCCUR DURING STORAGE OF
PROCESSED CHEESE AND THEIR EFFECTS
ON PRODUCT QUALITY**

By

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B.Sc. Agric. Sci. (Dairy Science) Al Azhar University, 1997

A thesis submitted in partial fulfillment

of

The requirements for the degree of

MASTER OF SCIENCE

in

Agricultural Science

(Dairy Science and Technology)

Food Science Department

Faculty of Agriculture

Ain Shams University

2015

Approval Sheet

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ABSTRACT

Hassan Hamed Mohamed Hamed: Changes that Occur During Storage of Processed Cheese and their Effects on Product Quality. Unpublished M.Sc. Thesis, Food Science Department, Faculty of Agriculture, Ain Shams University, 2015.

Processed cheese consumption increased in Egypt in recent years, because it has a high nutritional value, the ability to be saved for long time at room temperature, the great diversity of images, shapes, can consume in different forms (cheese blocks, strips, triangles etc.), cooked from various dairy products, in addition to its high economic revenue. Storage of processed cheese for long periods in the harsh conditions may cause regardless incomprehensible changes in spite of the thermally treatment during the manufacturing process. These changes may result spoke to cut the cheese quality output, leading to considerable material losses. The aim of this study was to find out the reasons for the negative changes that occur in processed cheese during storage and thus, try to reduce them and so improve the production and increase the quality of the product. Therefore, this research was planned to study these changes and the impact of processing conditions used and follow up the enzymatic residues during storage at different temperatures as well as its impact on the quality of the product.

The investigation was designed into two parts: the first part was conducted as survey for many types and shapes of processed cheese in the local market. Twenty six processed cheese samples were collected randomly from different retails outlet in Egypt. The samples were classified depending on the fat source into two groups (milk fat and vegetable fat) and the shape into three groups (triangle, cups, blocks). All processed cheese samples were stored at 5°C until examined for chemical, physical, texture properties with strength testing and detection of the enzymatic activity of lipase and protease enzymes. In samples containing milk fat, results showed that the moisture and meltability values were higher in cup forms than that of triangles shape while the average value of

oil index in triangles was higher than that of cup forms. Moisture contents of collected processed cheese with vegetable fats indicated that cup forms contained the highest and block form showed the lowest. Block processed samples showed lowest pH values with highest acidity content. Some brands of block forms were not meltale at all while others showed very low meltability. The oil separation index of block form samples was lower than that in triangle or cup form samples.

Part II of this study was conducted to investigate the properties of processed cheese spread produced at different cooking process. Processed cheese spread was produced by using traditional process (95°C/2min), or UHT process (140°C /20sec.). The produced spreads were evaluated for chemical, physical, protease and lipase activity as well as sensory properties when fresh and monthly during storage up to 6 months. The results obtained cleared that the traditional method of processed cheese has no effect on TN, fat and lactose contents. Storage of cheese samples significantly affected the content and the ratio decreased with increasing the storage temperature and period. The moisture and pH value were decreased during storage in all samples but the decrease was slightly higher in UHT processed cheese treatment. Soluble nitrogen content and titratable acidity were increased in all stored samples either at 5°C or 25°C up to 6 months. Protease and lipase activities were increased during storage in all treatments. The increase was highly pronounced in traditional processed cheese than in UHT cheese samples. Generally, total aerobic bacterial count was increased in all treatments during storage. The increase was more pronounced when the cheese was stored at 25°C. Total anaerobic spore forming bacterial count was decreased. Results of this work could be useful for setting UHT treatment in order to manufacture processed cheese with high sensory and nutritive quality values.

Keywords: processed cheese, cooking temperature, lipase activity, protease, enzyme residue, traditional process, UHT system

ACKNOWLEDGEMENT

I would like to express my deepest appreciation and sincere gratitude to **Prof. Dr. Mohamed A. El-Nawawy**, Professor of Dairy Microbiology, Food Science Department, Faculty of Agriculture, Ain Shams University, for his supervision, valuable suggestions and every possible help he offered throughout this study.

My deepest thanks and sincere appreciation are to **Prof. Dr. Rezk A. Awad**. Prof of Dairy Science at the same department, for his true efforts and revision of the manuscript.

Grateful acknowledgment is also due to my parents; family and everyone who assisted me achieve this manuscript.

CONTENTS

	Page
1 Introduction.....	1
2 Review of literature	6
3 Materials and methods	27
3.1.1 Surveyed processed cheese.....	27
3.1.2 Cheddar cheese.....	28
3.1.3 Skim milk powder.....	28
3.1.4 Vegetable fat	28
3.1.5 Milk protein concentrate.....	28
3.1.6 Thiking agents	28
3.1.6.1 Modified corn starch.....	28
3.1.6.2 Myprogen gum.....	28
3.1.6.3 xthansan gum.....	28
3.1.6.4 Guar gum.....	28
3.1.7 Emulsifying salts.....	29
3.1.8 Citric acids.....	29
3.1.9 Preservatives	29
3.1.9.1 Nisine.....	29
3.1.9.2 Potassium Sorbet	29
3.1.10 Sodium chloride.....	29
3.2 Methods.....	29
3.2.1 Methods of Manufacture.....	29
3.2.1.1 Processed cheese manufacture	29
3.2.1.2 Traditional	29
3.2.1.3 UHT processed cheese.....	30
3.2.2 Methods of Analysis.....	32
3.2.2.1 Chemical analysis.....	32
3.2.2.2 Physical properties	33
Meltability.....	33
- Oil separation	33
- TPA Texture Profile Analysis.....	34

	Page
3.2.2.3 Microbiological Analysis.....	34
- Total Viable Bacterial count (TVBC).....	34
- Anaerobic spore formers bacterial count	34
3.2.2.4 Enzyme Activity.....	35
- Protease activity.....	35
- Lipase activity.....	35
3.2.2.5 Sensory evaluation.....	35
4 RESULT AND DISCUSSION.....	36
4.1 Result and discussion (part I): Surveyed processed cheese.....	36
4.1.1 Group A : Processed cheese samples content (milk fat)	37
4.1.2 Chemical analysis.....	37
4.1.3 Physical properties	40
- Meltability.....	40
- Oil Separation	40
4.2 Group B: Processed cheese samples content (vegetable fat).....	42
4.2.1 Chemical analysis.....	42
4.2.2 Physical properties	46
- Meltability.....	46
- Oil separation	46
4.3 Result and discussion (part II): Manufacture of processed cheese spread with different heating treatments.....	48
4.3.1 Chemical analysis.....	48
4.3.2 Physical properties	56
- Meltability.....	56
- Oil separation	56
4.3.3 Enzyme Activity.....	56
- Protease activity.....	56

III

	Page
- Lipase activity.....	57
- TPA Texture Profile Analysis.....	61
4.3.4 Microbiological Analysis.....	67
- Total Viable Bacterial count (TVBC)	67
- Anaerobic spore formers bacterial count.....	67
4.3.5 Sensory evaluation.....	70
SUMMARY AND CONCLUSION	
.....	73
REFERENCE.....	78
ARABIAN SUMMARY	

LIST OF TABLES

NO	Title	Page
1	Raw ingredients used in processed cheese	30
2	Chemical composition of surveyed processed cheese samples in Egyptian local market with milk fat in the formula.	39
3	Meltability (mm) and oil separation index values of surveyed processed cheese samples in Egyptian local market with milk fat in the formula.	41
4	Chemical composition of surveyed processed cheese samples in Egyptian local market with vegetable fat in the formula.	45
5	Meltability (mm) and oil separation index values of surveyed processed cheese samples in Egyptian local market with vegetable fat in the formula.	47
6	Effect of cooking temperature on moisture (%), Fat/DM and nitrogen fractions of processed cheese during storage period.	50
7	Effect of cooking temperature of processed cheese on salt, lactose, and pH values and acidity when fresh and during storage period.	54
8	Effect of cooking temperatures on meltability (mm), oil separation and enzyme activity of processed cheese when fresh and during storage period at different temperatures.	58
9	Effect of different cooking methods on texture profile analysis (TPA) of processed cheese when fresh and during storage periods.	63
10	Effect of cooking temperatures of processed cheese on the bacterial flora (log cfu/g) when fresh and during storage at different temperatures.	68

NO	Title	Page
11	Sensory evaluation of processed cheese cooked and stored at different temperatures.	71