

STUDIES ON THE MANUFACTURE OF RICOTTA CHEESE

By

MAHMOUD ABD EL-AZIZ EL-SAYED

B.Sc. Agric. (Dairying) Assuit Univ., 1991

A thesis Submitted in Partial Fulfillment

of

The Requirement for the Degree

of

MASTER OF SCIENCE

In

Agriculture

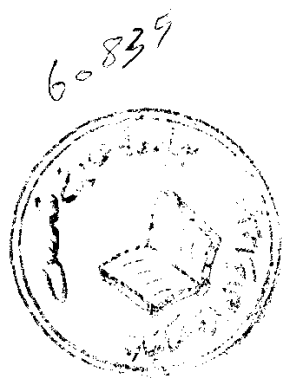
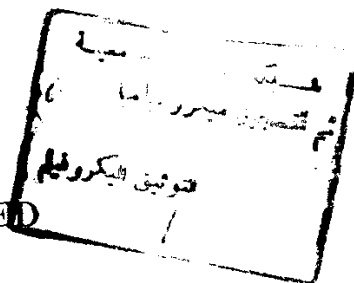
(Dairy Science and Technology)

Department of Food Science

Faculty of Agriculture

Ain Shams University

1997





APPROVAL SHEET

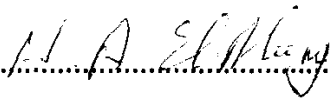
STUDIES ON THE MANUFACTURE OF RICOTTA CHEESE

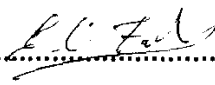
By

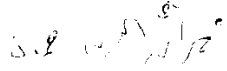
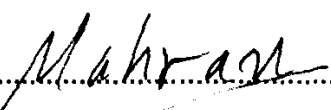
MAHMOUD ABDEL-AZIZ EL-SAYED

B.Sc. Agric. (Dairying) Assuit Univ., 1991

This thesis for M.Sc. degree has been approved by :

Prof. Dr. H.A. El-Alamy 
Prof. of Dairy Science, National Research Centre.

Prof. Dr. E.O. Fayed 
Prof. of Dairy Science, Fac. of Agric., Ain Shams Univ.


Prof. Dr. G.A. Mahran 
Prof. of Dairy Chemistry and Technology, Fac. of
Agric., Ain Shams Univ.

omination : 1110 1997

STUDIES ON THE MANUFACTURE OF RICOTTA CHEESE

By

MAHMOUD ABD EL-AZIZ EL-SAYED

B.Sc. Agric. (Dairying) Assuit Univ., 1991

Under the Supervision of:

Prof. Dr. G.A. Mahran

Prof. of Dairy Chemistry and Technology, Fac. of Agric.,
Ain Shams University.

Prof. Dr. Y.A. Hammad

Prof. of Dairy Chemistry and Technology, Fac. of Agric.,
Ain Shams University.

Prof. Dr. Nawal S. Ahmed

Prof. of Dairy Chemistry and Technology, National
Research Centre.

ABSTRACT

Mahmoud Abdel-Aziz El-Sayed. Studies on the manufacture of Ricotta cheese. Unpublished Master of Science, Ain Shams University, Faculty of Agriculture, Department of Food Science, 1997.

Fourty-two samples of Ricotta cheese were randomly collected from cairo market, and analysed for chemical composition and scoring. The average of chemical composition was 64.7, 36.61, 46.88, 9.41, 6.53, 1.25 and 0.29% for moisture, protein, fat, lactose; ash., salt (in water phase) and acidity contents respectively, as well as the average of pH value was 6.1. Average scoring was 32.0, 38.7 and 7.8 points for flavour (40 points) body & texture (50 points) and appearance (10 points) respectively.

Ricotta cheese was made from whey or whey fortified by skim milk powder (SMP) (0.5; 1.0, 1.5 and 2.0%) by direct acidification with acetic, citric or lactic acid to pH 5.8-5.9 at 87-88°C. Cheese made using lactic acid had a higher protein and fat recovery, and protein content than that from acetic and citric acids. Although, cheese made with acetic acid showed a higher yield and moisture content but lowest firmness than citric and lactic acids. There were some small differences in fat, lactose ash, salt and acidity contents, as well as pH values of Ricotta cheese manufactured with different acids. No major differences in organoleptic propreties were apparent between different acids. On the other hand, yield, protein and fat recovery, protein content,

and firmness increased with increasing the levels of SMP added to whey. Although addition of 1.0% SMP to whey was enough for reaching the maximum protein and fat recovery with lactic and acetic acids, citric acid needed to addition of 1.5% SMP to reach the maximum protein recovery. Moreover, addition of different levels of SMP to whey had no effect on the lactose, ash, salt and acidity contents as well as pH values compared with control cheese. Ricotta cheese made from whey/SMP blends (0.5 and 1.0%) had a higher scoring, which resembles control cheese (100% whey), than that made from whey/SMP blends (1.5 and 2.0%).

Key words : Ricotta cheese-acetic acid-citric acid-lactic acid.

ACKNOWLEDGEMENT

The author would like to express the deepest gratitude and sincere appreciations to **Prof. Dr. G.A. Mahran**, and **Prof. Dr. Y.A. Hammad**, Fac. of Agric., Ain Shams University and **Prof. Dr. Nawal S. Ahmed**, National Research Centre, for their guidance, valuable suggestions, encouragement and every possible help they kindly offered throughout the course of this thesis.

Thanks and appreciation should be extended to **Dr. A.F. Sayed**, Associate Prof., of Dairy Chemistry and Technology, National Research Centre, for his interest and encouragement during this work.

My sincere thanks to all staff members of Food Science and Dairy Department, National Research Centre for their kind-co-operation.

CONTENTS

	Page
• INTRODUCTION	1
• REVIEW OF LITERATURE	4
1- History, definition, characteristics and utilization of Ricotta cheese	4
2- Type of whey and additives used in the manufacture of Ricotta cheese	8
3- Precipitation agents	12
4- Manufacturing parameters of Ricotta cheese	18
5- Compositon of Ricotta cheese	23
• MATERIALS AND METHODS	29
A- Materials	29
1- Whey	29
2- Skim milk powder	29
3- Acidifing agents	29
B- Methods	30
- Method of Ricotta cheese manufacture	30
- Methods of analysis	30
1- Whey analysis	30
- Moisture, fat, total protein, ash, salt, acidity and contents.....	30
- Lactose content	30
- pH value	32
- Total coagulable protein (TCP)	32

	Page
2- Cheese analysis	32
- Moisture, fat, total protein, ash, salt acidity contents	32
- Lactose content	33
- pH value	33
- Fat and protein recovery	33
- Cheese firmness	33
- Cheese scoring	34
- Statistical analysis	34
- Experimental	34
• RESULTS AND DISCUSSION	36
Part I : Chemical composition and quality of market Ricotta cheese	36
Part II : Properties of Ricotta cheese manufactured by different acidulants from whey fortified by skim milk powder	50
• SUMMARY AND CONCLUSIONS	80
• REFERENCES	84
• ARABIC SUMMARY	

LIST OF TABLES

No.		Page
1	Amount of acidulants required in order to give pH 5.8-5.9 with different levels of skim milk powder to whey.....	29
2	Chemical composition of Ricotta cheese samples collected from Cairo markets.....	37
3	Scoring of Ricotta cheese samples collected from Cairo markets.....	46
4	Protein and fat recovery, and yield of Ricotta cheese manufactured by different acidulants from whey fortified by skim milk powder.....	51
5	Effect of addition of different levels of skim milk powder to whey on protein and fat recovery, and yield of Ricotta cheese.....	54
6	Effect of using different acidulants on the protein and fat recovery, and yield of Ricotta cheese.....	54
7	Chemical composition of Ricotta cheese manufactured by different acidulants from whey fortified by skim milk powder.....	59
8	Effect of addition of different levels of skim milk powder to whey on the chemical composition of Ricotta cheese.....	61
9	Effect of using different acidulants on the chemical composition of Ricotta cheese.....	62
10	Firmness of Ricotta cheese manufactured by different acidulants from whey fortified by skim milk powder.....	71
11	Effect of addition of different levels of skim milk powder to whey on the firmness of Ricotta cheese.....	72

	Page
12 Effect of using different acidulants on the firmness of Ricotta cheese.....	72
13 Organoleptic properties of Ricotta cheese manufactured by different acidulants from whey fortified by skim milk powder.....	75
14 Effect of addition of different levels of skim milk powder to whey on the organoleptic properties of Ricotta cheese.....	76
15 Effect of using different acidulants on the organoleptic properties of Ricotta cheese.....	76