ROLE OF DAIRY INGREDIENTS IN QUALITY AND SAFETY OF SOME FOOD PRODUCTS

By

AHMED THARWAT SOBHY BADAWY

B.Sc.Agric.Sc. (Dairy Science and Technology), Ain Shams University, 2004

A thesis submitted in partial fulfillment

of

the requirements for the degree of

MASTER OF SCIENCE

in

Agricultural Science

(Dairy Science and Technology)

Department of Food Science

Faculty of Agriculture

Ain Shams University

2012

دور الخامات اللبنية في جودة و سلامة بعض المنتجات الغذائية

رسالة مقدمة من

أحمد ثروت صبحي بدوي

بكالوريوس علوم زراعية (علوم وتكنولوجيا الألبان) ،جامعة عين شمس، 2004

للحصول على

درجة الماجستير في العلوم الزراعية
(علوم وتكنولوجيا الألبان)

قسم علوم الأغذية

كلية الزراعة

جامعة عين شمس

2012

ROLE OF DAIRY INGREDIENTS IN QUALITY AND SAFETY OF SOME FOOD PRODUCTS

By

AHMED THARWAT SOBHY BADAWY

B.Sc. Agric. Sc. (Dairy Science and Technology), Ain Shams University, 2004

Under the supervision of:

Dr. Rezk Azab Awad
Prof. of Dairy Science and Technology, Department of Food Science, Faculty of Agriculture, Ain Shams University (Principal Supervisor)

Dr. Zakaria Mohamed Rezk Hassan
Prof. of Dairy Science and Technology, Department of Food Science, Faculty of Agriculture, Ain Shams University

Dr. Mohamed Moustafa Mohamed
Associate Prof. of Food Science and Technology, Department of Food Science, Faculty of Agriculture, Ain Shams University

ABSTRACT

Ahmed Tharwat Sobhy Badawy: Role of Dairy Ingredients in Quality and Safety of Some Food Products. Unpublished M. Sc. Thesis, Department of Food Science, Faculty of Agriculture, Ain Shams University, 2012.

Due to the technological development in the field of food industry, in addition to the interest of health aspects in the recent period, and put strict condition on the export and import of food, their has been an attention to the role played of dairy ingredients and their effects on the quality and safety of food produced, dairy ingredients used in food industry are considered to be rich in nutritional value due to the protein content of high biological value, essential fatty acids, phospholipids, and mineral and vitamins.

This research aims to study the role played by dairy ingredients which may be added in the manufacturing of ice cream and chocolate and their effects on quality and safety of these food products. Afull concept for applying hazard analysis and critical control points (HACCP) during the manufacturing stages of these products was also carried ant. The study was done in two parts:

The first one was carried out to evaluate the effect of dairy ingredients in quality and safety of powdered ice cream. All dairy ingredients and the other materials were tested for its microbiological and chemical quality. The results of chemical analysis for these samples indicated that all ingredients were of high quality while the microbiological quality was low, especially of full cream milk powder.

Samples of powders ice cream showed different chemical and microbiological quality. The chemical results showed lower fat ratio in all samples of ice cream powders, ranging from (12.8–13%) which is lower than standard specifications of ice cream powders is (not

lower than 30%). Microbiological examination also showed lower microbiological quality due to of the lower quality of dairy ingredients used, especially full cream milk powder.

Swabs of tools, devices and hands of workers were taken and showed positive results which moony affect the safety and quality of produced ice cream.

The microbiological results showed also presence of large number of yeasts & fungi in most samples of retrieval ice cream. All produced recombined ice cream treatments showed acceptable sensory quality and vanilla type was the most acceptable one. Sensory quality was acceptable for all samples.

Application of hazard analysis and critical control points (HACCP) during the manufacturing stages of ice cream products to identify the most important sources of pollution cleared four critical control point (CCPs), which were (i)Receipt stage of ingredients (ii) Sieving (iii) Metal detection (iv) Freezing machine.

Part Π of this study was carried out to evaluate the role of dairy materials in quality and safety of chocolate. Samples of dairy materials and other materials used in chocolate industry were tested for chemical, microbiological examination and sensory quality. The results of chemical analyses of row ingredient samples showed high quality for all samples, while the microbiological examination was low, especially, in sample of full cream and skim milk powders. Swabs of tools, devices and also hands of workers and the results showed positive results and this affects safety and quality of the chocolate produced.

Chemical, microbiological and sensory properties of chocolate showed high quality of the samples, while microbiological examination was acceptable for all sample.

Application of hazard analyses and critical control points (HACCP) system to identify the most important pollutants during

manufacturing steps of chocolate has been detected there poi nts as critical control points (CCPs), which were (i) Receipt step of ingredients, (ii) Conch, (iii) Metal detection.

Key words:

Dairy ingredients – (HACCP) – Hazard – Ice cream – Chocolate – Safety – Quality – Food products.

ACKNOWLEDGEMENT

I wish to extend my deepest appreciation and sincere gratitude to **Prof. Dr. Rezk A. Awad,** Professor of Dairy Science and Technology, Food Science Department, Faculty of Agriculture, Ain Shams University for supervising this work, plentiful advice and for his efforts, writing the manuscript and encouraging me through this course. It is difficult to express in words my deep respect to him.

Thanks and gratefulness will not be enough to **Prof. Dr. Zakaria M. R. Hassan,** Professor of Dairy Science and Technology, Food Science Department, Faculty of Agriculture, Ain Shams University, for the kind attention, greater help and endless efforts provided for the accomplishment of this work.

I wish to find the words that can help me to express my gratefulness thanks, deepest gratitude and sincere appreciation to **Dr. Mohamed M. Abd El-Rzik,** Associate Prof. of Dairy Science and Technology, Food Science Department, Faculty of Agriculture, Ain Shams University, for his true efforts throughout the lab work and writing the manuscript, and encouraging me through this course. He taught me many things which I never have had the opportunity to learn.

I would like to thanks also to every one who provided help or advised me to achieve this manuscript.

CONTENTS