

DEVELOPMENT OF AVOCADO INCORPORATED YOGHURT



By

Partheeban Priyanthini



FTC352

Main Library, Eastern University, Sri Lanka

Department of Biosystems Technology

Faculty of Technology

Eastern University, Sri Lanka

2025

ABSTRACT

Yoghurt is a widely consumed fermented dairy product valued for its nutritional and functional properties. The incorporation of fruit pulps has been explored to enhance its sensory appeal and nutritional quality. This study aimed to develop yoghurt fortified with avocado (*Persea americana*) pulp and to evaluate its nutritional composition, sensory characteristics, and microbiological quality. Fresh milk was pasteurized and used to produce yoghurt with five formulations containing different proportions of avocado pulp: T₀ (0 g avocado pulp, 100 ml milk), T₁ (2.5 g avocado pulp, 97.5 ml milk), T₂ (5 g avocado pulp, 95 ml milk), T₃ (7.5 g avocado pulp, 92.5 ml milk), and T₄ (10 g avocado pulp, 90 ml milk). Sensory evaluation indicated that the formulation containing 2.5 g avocado pulp and 97.5 ml milk (T₁) was the most preferred by the panelists. The control sample (T₀) exhibited moisture content, total ash, crude protein, fat, pH, total soluble solids, and acidity values of 73.17%, 1.59%, 3.25%, 2.92%, 4.53, 5.40, and 0.57, respectively. In comparison, the best performing sample (T₁) recorded values of 71.20%, 1.63%, 3.17%, 3.50%, 4.40, 5.50, and 0.63, respectively. Microbiological analysis showed total plate counts of 0.67×10^3 CFU/g and yeast and mold counts of 1.8×10^1 CFU/g for T₀ and 0.43×10^3 CFU/g and 1.5×10^1 CFU/g for T₁. The inclusion of avocado pulp contributed to increased fat and ash contents in T₁ relative to T₀. Overall, the addition of 2.5 g avocado pulp improved the yoghurt's nutritional quality, sensory acceptability, and microbiological safety, demonstrating its potential as a healthy and appealing functional dairy product.

Key words: Avocado pulp, Nutritional composition, Sensory properties, Yoghurt

TABLE OF CONTENTS

ABSTRACT.....	i
LIST OF FIGURES	vii
LIST OF TABLES	viii
ABBREVIATIONS AND SYMBOLS.....	ix
CHAPTER 1	1
INTRODUCTION.....	1
1.1. Background.....	1
1.2. Aim	3
1.3. Objectives	3
LITERATURE REVIEW.....	4
2.1. Milk	4
2.1.1. Historical aspects of milk consumption.....	4
2.1.2. Composition of milk	4
2.1.2.1. Water	5
2.1.2.2. Proteins.....	5
2.1.2.3. Lactose	5
2.1.2.4. Fat.....	5
2.1.2.5. Vitamins and Minerals	6
2.1.3. Current state of dairy industry in Srilanka.....	6
2.2. Yoghurt.....	7
2.2.1. History.....	7
2.2.2. Yoghurt manufacturing procedure	8
2.2.2.2. Homogenization	9
2.2.2.3. Heat treatment	9
2.2.2.4. Inoculation and fermentation	10
2.2.2.5. Cooling.....	10
2.2.3. Microorganisms involved in yoghurt fermentation	10
2.2.3.1. Lactic acid bacteria.....	10
2.2.3.2. <i>Streptococcus thermophilus</i> (ST).....	11

2.2.3.3. <i>Lactobacillus bulgaricus</i> (LB)	11
2.2.4. Types of yoghurt	11
2.2.4.1. Set-type yoghurt	12
2.2.4.2. Stirred-yoghurt	12
2.2.4.3. Frozen yoghurt	12
2.2.4.5. Flavored yoghurt	13
2.2.5.2. Anti-cancer	14
2.2.5.3. Improve gut health	14
2.2.5.4. Weight Management	14
2.2.7. Recent trends and innovations in dairy industry	15
2.3. Avocado (<i>Persea americana</i>)	16
2.3.2. Morphological characteristics of avocado	17
2.3.3. Worldwide production	17
2.3.4. Applications and the form of preservation.....	18
2.3.4.1. Edible coating.....	18
2.3.4.3. Modified atmosphere packaging	19
2.3.5. Health benefits of Avocado	19
CHAPTER 3	21
MATERIALS AND METHODOLOGY	21
3.1. Experimental Duration and site Description	21
3.2. Materials and Experimental Design	21
3.2.1. Materials	21
3.2.1.2. Procurement of materials	21
3.2.2. Experimental Design.....	21
3.3. Methodology	22
3.3.1. Preparation of Avocado pulp	22
3.3.2. Preparation of gelatin	22
3.3.3. Development of yoghurt	22
3.4. Sensory Evaluation	24
3.4.1. Materials used for sensory evaluation.....	24
3.4.2. Serving the samples for sensory evaluation.....	25

3.5. Physiochemical properties of avocado incorporated yoghurt..... 25

3.5.1. Determination of pH 25

3.5.1.1. Principle 25

3.5.1.2. Materials..... 25

3.5.1.3. Procedure..... 25

3.5.2. Determination of Titratable Acidity 26

3.5.2.1. Principle 26

3.5.2.2. Materials..... 26

3.5.2.3. Procedure..... 26

3.5.3. Determination of Total soluble solids (TSS) 27

3.5.3.1. Principle 27

3.5.3.2. Materials..... 27

3.5.3.3. Procedure..... 27

3.5.4. Determination of Moisture Content 27

3.5.4.1. Principle 27

3.5.4.2. Materials..... 28

3.5.4.3. Procedure..... 28

Weight of wet sample 28

3.5.5. Determination of Ash content..... 28

3.5.5.1. Principle 28

3.5.5.2. Materials..... 28

3.5.5.3. Procedure..... 29

3.5.6. Determination of Crude Protein content (Kjeldahl method)..... 29

3.5.6.1. Principle 29

3.5.6.2. Materials..... 29

3.5.6.3. Procedure..... 30

3.5.7. Determination of Fat content 30

3.5.7.1. Principle 30

3.5.7.2. Materials..... 31

3.5.7.3. Procedure..... 31

3.6. Microbial analysis..... 31

3.6.1. Total plate count	32
3.6.1.1. Principle	32
3.6.1.2. Materials	32
3.6.1.3. Procedure	32
3.6.2. Yeast and mold count	33
3.6.2.1. Principle	33
3.6.1.2. Materials	33
3.6.1.3. Procedure	33
3.7. Statistical analysis	34
CHAPTER 4	35
RESULTS AND DISCUSSION	35
4.1. Sensory evaluation of Avocado incorporated yoghurt	35
4.1.1. Texture	35
4.1.2. Color	37
4.1.3. Smell	37
4.1.4. Taste	38
4.1.5. Appearance	38
4.1.6. Overall acceptability	39
4.2. Physiochemical analysis of avocado incorporated yoghurt	39
4.3.1. Moisture content	40
4.3.2. Ash content	41
4.3.3. Protein content	41
4.3.4. Fat content	42
4.2.1. pH	43
4.2.2. Total soluble solids (TSS)	44
4.2.3. Acidity	44
4.4. Microbial analysis	45
4.4.1 Total plate count	45
4.4.2. Yeasts and mold count	46
CHAPTER 5	47
CONCLUSION	47

5.1. RECOMMENDATIONS AND SUGGESTION 48

REFERENCES 49

APPENDICES 56