

DEVELOPMENT AND QUALITY EVALUATION OF BISCUITS USING WHEAT FLOUR AND SWEET POTATO FLOUR



By
Murugesh Rajeshwary



FTC354

Main Library, Eastern University, Sri Lanka

**Department of Biosystems Technology, Faculty of Technology
Eastern University, Sri Lanka**

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ABSTRACT

Biscuits are popular bakery products enjoyed for their good taste, low cost, and long shelf life. Most biscuits are made using refined wheat flour, which gives a good structure but provides limited nutrition. This study was carried out to improve the nutritional value of biscuits by replacing part of the wheat flour with sweet potato flour. Five mixing ratios were used: 100:0 (T₀), 90:10 (T₁), 80:20 (T₂), 70:30 (T₃), and 60:40 (T₄). All biscuits were prepared under the same conditions and tested for their physical qualities, chemical composition, and microbial safety to identify the best formulation. Physical results showed noticeable changes when sweet potato flour was added. The control sample T₀ had a diameter of 3.39 cm, a thickness of 0.77 cm, and a spread ratio of 4.76. The T₄ sample, which contained the highest sweet potato level, showed better spread ratio during baking with a diameter of 3.90 cm, a thickness of 0.55 cm, and a spread ratio of 7.84. Biscuit weight also reduced from 5.61 g in T₀ to 4.86 g in T₄, indicating improved dough expansion. Chemical results also changed with sweet potato flour. Moisture increased from 3.68% in T₀ to 4.45% in T₄. Ash increased from 1.29% to 1.50%, and fiber increased from 0.46% to 0.66%. Protein slightly decreased from 4.05% in T₀ to 3.95% in T₄, and fat decreased from 25.45% to 20.21%. Other nutritional values such as total sugar, reducing sugar, antioxidant activity, pH, and total soluble solids also shifted in a positive direction, showing that T₄ had an overall better nutritional profile. Microbial testing conducted after one week showed that both T₀ and T₄ were safe for consumption. The control sample (T₀) recorded 0.72 CFU/g, while the best sample (T₄) recorded a slightly lower value of 0.64 CFU/g. This shows that adding sweet potato flour did not increase microbial growth and remained within safe limits. Therefore, the study showed that replacing wheat flour with sweet potato flour improved the nutritional and physical qualities of the biscuits while keeping them microbiologically safe. Among all treatments, T₄ (60% wheat flour and 40% sweet potato flour) was identified as the best formulation because it offered better nutrients, improved physical properties, and a lower microbial count than the control.

Keywords: Composite flour, Nutritional quality, Sweet potato flour, Sensory evaluation, Sustainable bakery development, Wheat flour.

TABLE OF CONTENTS

ABSTRACT	i
LIST OF FIGURES	vii
LIST OF TABLES	viii
ABBREVIATIONS AND SYMBOLS	viii
CHAPTER 1	1
INTRODUCTION	1
1.1 Background	1
1.2 Objectives	3
CHAPTER 2	4
LITERATURE REVIEW	4
2.1 Biscuits	4
2.2 Health Benefits of Biscuit	4
2.3 Raw Material Used For Biscuit	4
2.3.1 Sugar	4
2.3.2 Butter	4
2.3.3 Water	5
2.3.4 Wheat Flour	5
2.3.5 Sweet Potato	7
2.3.5.1 Taxonomical Classification of Sweet Potato	7
2.3.5.2 Production of Sweet Potato	7
2.3.5.3 Variety of Sweet Potato	8
2.3.5.5 Industrial Benefits of Sweet Potato	9
2.3.5.6 Nutritional Composition of Sweet Potato Flour	10
2.3.5.7 Health Benefits of Sweet Potato	11
CHAPTER 3	14
MATERIALS AND METHODS	14
3.1 Materials	14
3.2 Sweet Potato Flour Preparation	14

3.3 Biscuit Preparation	15
3.4. Sensory Evaluation.....	16
3.4.1. Material Used For Sensory Evaluation.....	16
3.4.2 Serving of Sample for Sensory Evaluation.....	17
3.5 Physical properties of sweet potato flour incorporated with wheat flour composite biscuits.....	17
3.5.1 Thickness, Diameter, and Weight.....	17
3.5.2 Spread Ratio	18
3.5.3 Texture / Hardness.....	18
3.5.4 Volume	18
3.5.5 Density.....	18
3.5.6 Color	18
3.6 Physicochemical Analysis.....	19
3.6.1 Determination of Moisture Content.....	19
3.6.1.1 Principle	19
3.6.1.2 Material	19
3.6.1.3 Procedure	19
3.6.1.4 Calculation	19
3.6.2 Determination of Ash Content.....	20
3.6.2.1 Principle	20
3.6.2.2 Material	20
3.6.2.3 Procedure	20
3.6.2.4 Calculation	21
3.6.3. Determination of Crude Protein Content (Kjeldahl Method).....	21
3.6.3.1 Principle	21
3.6.3.2 Reagents.....	21
3.6.3.3 Procedure	21
3.6.3.4 Calculation	22
3.6.4 Determination of Fat Content in Foods	23
3.6.4.1 Principle	23
3.6.4.2 Material	23
3.6.4.3 Procedure	23

3.6.4.4 Calculation	24
3.6.5 Determination of Crude Fiber in Food	24
3.6.5.1 Principle	24
3.6.5.2 Procedure	24
3.6.5.3 Calculation	25
3.6.6 Determination of Reducing Sugar	25
3.6.6.1 Principle	25
3.6.6.2 Material	25
3.6.6.3 Procedure	26
3.6.6.4 Calculation	26
3.6.7 Determination of Total Sugar	26
3.6.7.1 Procedure	26
3.6.7.2 Calculation	27
3.6.8 Total Soluble Solids (TSS)	27
3.6.8.1 Principle	27
3.6.8.2 Materials Needed	27
3.6.8.3 Procedure	28
3.6.9 Determination of pH	28
3.6.9.1 Principle	28
3.6.9.2 Material	28
3.6.9.3 Procedure	29
3.6.10 Determination of antioxidant activity	29
3.6.10.1 Principle	29
3.6.10.2 Material	29
3.6.10.3 Procedure	29
3.7 Microbial analysis (Total plate count)	30
3.7.1 Principle	30
3.7.2 Procedure	30
3.8 Statistical analysis	31
CHAPTER 4	32
RESULTS AND DISCUSSION	32

4.1 Physical Properties of developed biscuit using wheat flour and sweet potato flour	32
4.1.1 Diameter	32
4.1.2 Thickness	34
4.1.3 Spread Ratio	34
4.1.4 Volume	34
4.1.5 Weight	35
4.1.6 Density	35
4.2 Physiochemical Properties of Developed Biscuit Using Wheat Flour and Sweet Potato Flour	36
4.2.1 Moisture Content	36
4.2.2 Ash Content	37
4.2.3 Protein Content	38
4.2.4 Fat Content	39
4.2.5 Fiber Content	40
4.2.6 Antioxidant Content	41
Table 4.2 Antioxidant, Total Sugar, Reducing Sugar Content of Developed Biscuit Using Wheat Flour	42
4.2.7 Total Sugar Content of	42
4.2.8 Reducing Sugar Content of Developed Biscuit	43
4.2.9 pH Content of Developed Biscuit	44
4.3 Organoleptic Analysis of Developed Biscuit	45
4.3.1 Flavor of Each Treatment	45
4.3.2 Taste of Each Treatment	46
4.3.3 Color of Each Treatment	47
4.3.4 Texture of Each Treatment	47
4.3.5 Overall Acceptability	47
4.4 Microbial Analysis of Developed Biscuit	48
4.5 Shelf Life of Developed Biscuit	49
CHAPTER 5	51
CONCLUSION	51
SUGGESTIONS	52
APPENDICES	60