

STUDY ON DEVELOPMENT OF PUMPKIN JAM



BY

D.P.M.G.P.N. DASANAYAKA



FTC 12

Project Report
Library - EUSL

DEPARTMENT OF BOI SYSTEMS TECHNOLOGY

FACULTY OF TECHNOLOGY

EASTERN UNIVERSITY

SRI LANKA

2021

ABSTRACT

This study was carried out to investigate the potential of pulp obtained from pumpkin (*Cucurbita maxima*) for jam production with a view to improving utilization efficiency of the pumpkin fruits thereby adding value to the pumpkin, in order to reduce postharvest losses of pumpkin. There is a lot of postharvest losses to vegetables like pumpkin in our country. The pumpkins for the study were collected from Alawwa.

The jam was prepared by using various flavoring agents like cinnamon powder and bee honey with pumpkin pulp. The treatments are as follows. T₁ - Ordinary pumpkin pulp, T₂ - Pumpkin pulp with cinnamon powder, T₃ - Pumpkin pulp with bee honey. Physico-chemical analysis vs.- pH, Ash content, Moisture content (MC), Total Soluble Solids (TSS) and Titrable acidity (TA) and sensory analysis vs.- Texture, Colour, Smell, taste, appearance and overall acceptability were conducted for each treatment of the jam. Physico-Chemical analysis was conducted by using standard AOAC methods. In physico-chemical analysis there was a decrease of pH value in T₁ which is responsible for the low pH of pumpkin and lime. In T₂ had highest amount of ash and Total Soluble Solids. The highest moisture content was in T₁. T₃ had a highest value of titrable acidity. T₂ had pH 4.53, Ash content 0.53, Moisture content 55.88, Total soluble solids 60.97 and Titrable acidity 0.42 and it does not exceed the FAO minimum parameters.

Sensory evaluation was conducted using a sensory panel consisting 20 semi trained panelists. The texture, colour, smell, taste, appearance and overall acceptability were evaluated using a Nine-point hedonic scale. In the sensory analysis T₂ had highest

texture, colour, smell, taste, overall acceptability and appearance. And also T₃ had highest texture and taste similar to T₂. T₁ had highest appearance similar to T₂.

Therefore, jam prepared from pumpkin pulp with cinnamon powder is the best jam sample within three treatments and there is no any harmful effect to the consumers. Therefore, it can be concluded that jam prepared by pumpkin pulp with cinnamon powder is having good potential for the commercial production.

TABLE OF CONTENT

ABSTRACT	i
ACKNOWLEDGEMENT	iii
TABLE OF CONTENT	v
LIST OF TABLES	ix
LIST OF FIGURES	x
LIST OF PLATES	xi
ABBREVIATIONS	xii
CHAPTURE 1	1
Introduction.....	1
CHAPTURE 2	4
Review of Literature	4
2.1 Pumpkins	4
2.1.1 Introduction	4
2.1.2 Ecology	4
2.1.3 Taxonomy	4
2.1.4 Agriculture and botanical description	5
2.1.5 Quality characteristics and criteria	6
2.2 Uses of pumpkin	6
2.3 Medicinal properties of pumpkin	7
2.3.1 Anti-carcinogenic effect	7
2.3.2 Tape warm	7
2.3.3 Anti-diabetes	7
2.3.4 Depression	8
2.4 Nutritional properties of pumpkin	8
2.5 Chemical composition of pumpkin	9

2.5.1 Pumpkin polysaccharides.....	9
2.5.2 Carotenoids	9
2.5.3 Fats.....	10
2.5.4 Ash	10
2.5.5 Crude fiber	11
2.5.6 Carbohydrates	11
2.5.7 Minerals	11
2.5.8 Amino acids and active proteins	12
2.5.9 The B-Vitamins.....	12
2.5.10 Ascorbic acid (Vitamin C)	13
2.5.11 α – tocopherol (Vitamin E)	13
2.5.12 Thiamine	13
2.5.13 Riboflavin.....	14
2.5.14 Pigments and others	14
2.6 Jam.....	18
2.7 Raw materials needed to preparation of jam manufacture	20
2.7.1 Fruits	20
2.7.2 Cinnamon powder	20
2.7.3 Acid.....	21
2.7.4 Sugar	21
CHAPTURE 3.....	22
Materials and Methods	22
3.1 Materials	22
3.1.1 Materials used	22
3.1.2 Equipment used.....	22
3.1.3 Collection of materials	23
3.2 Methodolog.....	23
3.2.1 Preparation of raw materials	23
3.2.1.1 Preparation of cinnamon powder.....	23
3.2.2 Procedure of jam preparation	24
3.2.2.1 Sterilization of glass bottles	26
3.3 Physico-chemical analysis of jam	26
3.3.1 Determination of pH	26
3.3.1.1 Materials	26

3.3.1.2 Principle.....	27
3.3.1.3 Procedure.....	27
3.3.2 Determination of moisture content (MC)	27
3.3.2.1 Materials.....	27
3.3.2.2 Principle.....	28
3.3.2.3 Procedure.....	28
3.3.2.4 Calculation.....	28
3.3.3 Determination of ash content (AC)	28
3.3.3.1 Materials.....	28
3.3.3.2 Principle	29
3.3.3.3 Procedure	29
3.3.3.4 Calculation.....	29
3.3.4 Determination of Total Soluble Solid content (TSS)	29
3.3.4.1 Materials.....	29
3.3.4.2 Principle.....	30
3.3.4.3 Procedure.....	30
3.3.5 Determination of Titrable Acidity (TA)	30
3.3.5.1 Materials.....	30
3.3.5.2 Principle.....	31
3.3.5.3 Procedure.....	31
3.3.5.4 Calculation.....	31
3.4 Sensory evaluation of jam.....	32
3.4.1 Materials for sensory evaluation	32
3.4.2 Cording the jam samples	33
3.4.3 Serving of jam samples	33
3.5 Statical Analysis	33
CHAPTER 04.....	34
Results and Discussion.....	34
4.1 preparation of pumpkin jam by using Cucurbita maxima variety	34
4.2 Physico-Chemical Qualities of pumpkin Jam	34
4.2.1 pH.....	34
4.2.2 Ash content	35
4.2.3 Moisture Content (MC)	36
4.2.4 Total Soluble Solids (TSS)	37

4.2.5 Titration acidity	38
4.3 Sensory evaluation of pumpkin jam	38
4.3.1 Texture.....	39
4.3.2 Colour.....	39
4.3.3 Smell	40
4.3.4 Taste.....	40
4.3.5 Appearance.....	41
4.3.6 Overall acceptability	41
CHAPTER 05.....	42
Conclusion	42
References	44
Appendices	48
Appendix - 01.....	48
Appendix - 02.....	49

LIST OF TABLES

Table 2.5 Nutrient composition of pumpkin.....	14
Table 3.4.2 Samples with respective codes.....	33
Table 4.2.1 pH of each treatment in this study.....	34
Table 4.2.3 Moisture content of each treatment in this study.....	36
Table 4.2.5 Titratable Acidity of each treatment in this study.....	38

LIST OF FIGURES

Figure – 4.2.2 Ash content of each treatment in this study	35
Figure – 4.2.4 Total Soluble Solids of each treatment in this study	37
Figure - 4.3.1 The texture of pumpkin jam T ₁ , T ₂ and T ₃	39
Figur - 4.3.2 The colour of pumpkin jam T ₁ , T ₂ and T ₃	39
Figure – 4.3.3 The smell of pumpkin jam T ₁ , T ₂ and T ₃	40
Figure – 4.3.4 The taste of pumpkin jam T ₁ , T ₂ and T ₃	40
Figure – 4.5.3 The appearance of pumpkin jam T ₁ , T ₂ and T ₃	41
Figure – 4.3.6 The overall acceptability of pumpkin jam T ₁ , T ₂ and T ₃	41

LIST OF PLATES

3.2.1.1. Plate ; (a) cinnamon bark, (b) Grinded cinnamon, (c) sieved cinnamon	24
3.2.2. Plate ; (a) jam production , (b) sheet test , (c) jam colour	24
(T ₁ - ordinary pumpkin jam, T ₂ - pumpkin jam with cinnamon powder, T ₃ - pumpkin jam with bee honey)	25
Plate 3.5 Picture of titration	31
Plate 3.4 Sensory evaluation at EUSL Bio Systems Technology Lab	32