

**PRODUCTION OF MIX FRUIT JAM USING  
JACKFRUIT AND PINEAPPLE PULP AND  
EVALUATION OF PHYSICAL AND CHEMICAL  
PARAMETERS**



**BY**

**P.S.M. PRABHASHINI**



FTC 22



Project Report  
Library - EUSL

**DEPARTMENT OF BIOSYSTEMS TECHNOLOGY  
FACULTY OF TECHNOLOGY  
EASTERN UNIVERSITY  
SRI LANKA**

**2021**

## ABSTRACT

This study was conducted to investigate the potential of pulps obtained from the jackfruit and pineapple for the jam production to improve utilisation effecting of the jack fruit and Pineapple. And also encouraging its cultivation and sustainable management in sri Lanka. The fruits for the study were collected from the Negombo area. The Jam was prepared using a variable proportion of jack fruit and pineapple pulps.

The jack fruit and pineapple pulps are the most important part of this research because both fruits contain a high amount of nutrients and health benefits. The main reason for the combination for this both fruits this fruits harvesting in the same period time so, that time period increases the post-harvest loses in both fruits so by making this mix fruit jam can reduce the post-harvest losses in both fruits and can give the different taste jam product than the market available jam in now a day. The above reasons were given some idea to preparing mix fruit Jam from the pineapple and jackfruit pulps.

Firstly, obtain maturated ripening pineapples and jack fruits. The dust and dirt were removed. Next, the pineapple and jackfruit unwanted portions were removed. After that, all the fruits was cleaned well and then cut in to small pieces and pulped by using a food blender. Then different pineapple and jack fruit mixtures were made by adding different amount of pineapple pulp and jack fruit pulps. Then that different mixture were added the same amount of Sugar and lemon juice and after heating it over a fire by stirring continuously till the final appearance became solid type did the flake test. Removed from the fire and allowed cool to room temperature. There was five treatments with different concentration of pineapple and jack fruit pulp. Physico-Chemical Analysis vs.- pH, titratable Acidity, total

content, Moisture content, Vitamin C and Sensory Analysis, were conducted for each treatment of the Jam. The treatments are as follows T1 – Jam formulation of (Jack fruit: Pineapple 50:50) T2 - jam formulation (Jackfruit: Pineapple 75:25), T3 jam formulation (jackfruit: Pineapple 25:75) , T4 -Jam formulation (Jackfruit: Pineapple 10:90) ,T5 Jam formulation (Jackfruit: Pineapple 90:10) The jackfruit: Pineapple 90: 10 has highest pH and Jackfruit: Pineapple 90:10 has lowest PH value. Among the treatment highest value of the Moisture content of T1 (Jackfruit: 50Pineapple :50) 60.48 a lowest value of the moisture content is T5 Jackfruit: Pineapple 90:10) 57.11 highest value of the TSS is T1(Jackfruit: pineapple 50: 50). Highest TA value is T5 (Jackfruit: pineapple 90 :10) Lowest TA value is T4 (jackfruit: Pineapple (10: 90). Highest Ash content is T5 (Jackfruit: pineapple 90:10) and T2 (Jackfruit: pineapple 90 :10) Lowest Ash value is T1(jackfruit: Pineapple 50 :50). Sensory evaluation was conducted using a sensory panel consisting of 20 semi trained panelists. The color, taste, texture, structure, smell and Overall acceptability were evaluated using a Nine– point hedonic scale. In the sensory analysis, T1 has the highest colour, appearance, structure, smell, taste and the overall acceptance. T1 Jackfruit: Pineapple 50:50 it's PH value is 4.46 and TSS. IS 60.48, TA 0.35 doesn't exceed the EPFO, FAO minimum parameters. Therefore, T1 jam formulation having jackfruit: Pineapple 50:50 highly recommended.

# TABLE OF CONTENTS

Abstract.....	i
ACKNOWLEDGEMENT.....	iv
TABLE OF CONTENTS .....	vi
LIST OF TABLES .....	vii
LIST OF FIGURES.....	viii
LIST OF PLATES.....	ix
ABBREVIATIONS.....	x
CHAPTER 01 .....	1
1.1.Introduction.....	1
CHAPTER TWO.....	5
2.0. LITERATURE REVIEW .....	5
2.1. History.....	5
<b>2.1.1. History of the jackfruit (Artocarpus heterophyllus Lam.).....</b>	<b>5</b>
<b>2.1.2. History of the pineapple (Ananas comosus) plant .....</b>	<b>6</b>
<b>2.1.3. Originality and Distribution of Jackfruit and pineapple.....</b>	<b>6</b>
2.2. Description of the fruits .....	7
<b>2.2.1. Composition of ripe jack fruit and pineapple in 100g edible portion.....</b>	<b>8</b>
2.3. Benefits of jackfruit and pineapple .....	10
<b>2.3.1.nutritional value of the fruits.....</b>	<b>11</b>
<b>2.3.2.Medicinal benefits.....</b>	<b>12</b>
<b>2.3.3.Other importance uses in the jack fruit and pineapple .....</b>	<b>14</b>
2.4. Jam production technology .....	15
2.5. Raw materials needed to preparation of jam.....	16
<b>2.5.1.fruit .....</b>	<b>16</b>
<b>2.5.2. Codex Stands definitions for fruit, pulp, puree .....</b>	<b>16</b>
<b>2.5.3. Sugar.....</b>	<b>17</b>
<b>2.5.4. Pectin .....</b>	<b>18</b>
<b>2.5.5. Acids.....</b>	<b>19</b>
CHAPTER 03.....	20
MATERIALS AND METHODS.....	20

3.1. Experimental location .....	20
3.2. Experiment Design .....	20
3.3 .Materials, Ingredients and Equipment .....	21
<b>3.3.1. Material collection.....</b>	<b>21</b>
3.4. METHODOLOGY .....	21
<b>3.4.1. preparation of pineapple pulp .....</b>	<b>21</b>
<b>3.4.2. preparation of jack fruit pulp .....</b>	<b>22</b>
<b>3.4.3. sterilization of glass jam bottles .....</b>	<b>22</b>
<b>3.4.4. preparation of jam .....</b>	<b>22</b>
3.5. Physio-Chemical Analysis of Jam without Preservatives.....	23
<b>3.5.1. Determination of pH .....</b>	<b>24</b>
3.5.1.1. Principle.....	24
3.5.1.2. Materials .....	24
3.5.1.3. Procedure .....	24
<b>3.5.2. Determination of Titratable acidity .....</b>	<b>24</b>
3.5.2.1. Principle.....	24
3.5.2.2. Materials .....	25
3.5.2.3. Procedure .....	25
<b>3.5.3. Determination of Total Soluble Solids.....</b>	<b>26</b>
3.5.3.1. Materials .....	26
3.5.3.2. Procedure .....	26
<b>3.5.4. Determination of Ascorbic acid .....</b>	<b>26</b>
3.5.4.1. Principle.....	26
3.5.4.2. Materials .....	26
3.5.4.3. Procedure .....	27
3.5.4.4. Calculation.....	27
<b>3.5.5. Determination of Moisture content .....</b>	<b>28</b>
3.5.5.1. Materials .....	28
3.5.5.2. principle .....	28
3.5.5.3. procedure .....	28
3.5.5.4. calculation .....	28
<b>3.5.6. Determination of Ash content .....</b>	<b>29</b>
3.5.6.1. Materials.....	29
3.5.6.2. principle .....	29
3.5.6.3. procedure .....	29

3.5.6.4. calculation.....	29
3.6. Sensory Evaluation.....	30
<b>3.6.1 Materials for Sensory Evaluation .....</b>	<b>31</b>
<b>3.6.2. Cording sample and serving.....</b>	<b>31</b>
<b>3.6.3. Serving the samples .....</b>	<b>32</b>
3.7 Statistical Analysis .....	32
CHAPTER 04.....	33
4.0 RESULTS AND DISCUSSION.....	33
4.1.Preparation of mix fruit jam using pineapple and jackfruit pulp .....	33
4.2.Quality characteristic of mix fruit jam with pineapple and jackfruit pulp	32
<b>4.2.1. pH.....</b>	<b>34</b>
<b>4.2.2.Total moisture content .....</b>	<b>35</b>
<b>4.2.3.Total Soluble solid (TSS).....</b>	<b>36</b>
<b>4.2.4.Titratable Acidity (TA) .....</b>	<b>37</b>
<b>4.2.5.Total Ash content.....</b>	<b>38</b>
<b>4.2.6.vitamin C .....</b>	<b>39</b>
4.3. Sensory Evaluation of mix fruit jam(pineapple and jackfruit pulp).....	40
<b>4.3.1.Colour .....</b>	<b>40</b>
<b>4.3.2.Appearance of mix fruit jam(pineapple and jackfruit jam).....</b>	<b>40</b>
<b>4.3.3Texture.....</b>	<b>41</b>
<b>4.3.4Taste.....</b>	<b>42</b>
<b>4.3.5.Structure.....</b>	<b>42</b>
<b>4.3.6.Smell.....</b>	<b>43</b>
<b>4.3.7.Overall Acceptability.....</b>	<b>44</b>
CHAPTER 05.....	45
5.0CONCLUSIONS .....	45
SUGGESTIONS FOR FUTURE RESEARCH.....	47
REFERENCES.....	48
APPENDICES .....	51

## LIST OF FIGERS

Figer 4.3 color of pineapple and jack fruit jam with different fruit pulp ratio.....	40
Figer 4.4. Apperence of mix fruit jam with different pulp ratio .....	41
Figer 4.5.Texture of mix fruit jam with different fruit pulp ratio .....	41
Figer 4.6 .Taste of the mix fruit jam with different fruit pulp ratio .....	42
Figer 4.7. structure of h emixfruit jam with different fruit pulp ratio.....	43
Figer 4.8.Smell of the mix fruit jam with different fruit pulp ratio .....	43
Figer 4.9.Overall acceptability of the mixfrui jam with different fruit pulp ratio .....	44

## List of plates

3.4.4.plate (a ) Raw materials for jam produce ; (b) Preparation of jam ; ( c ) Flake test ; .....	23
( d ) Final samples .....	23
Plate 3.6. sensory evaluation at EUSL Bio system technology department lab .....	30



## LIST OF TABLES

Table 03-1 Experiment Design .....	20
Table 3. 1: Formulations with Respective Codes .....	31
Table 4-01 pH of each treatment of in this study .....	34
Table 4-02 Total moisture content of each treatment in this study .....	35
Table 4-03 Total soluble solid content of each treatment in this study .....	36
Table 4-04 Titrable acidity content of each treatment in his study .....	37
Table 4-05 Total Ash content of each treatment in this study .....	38
Table 4-06 Vitamin C content of each treatment in this study .....	39