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POSTHARVEST CHANGES AND PERFORMANCE AT PROCESSING OF SOME SRI LANKAN VEGETABLES

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ABSTRACT

This work was carried out to study the processing possibilities of bittergourd, snakegourd and ridgegourd. These three vegetables were subjected to freezing,dehydration and fermentation. It was found that freezing was the superior processing method for these vegetables when compared to dehydration and fermentation. In the case of bittergourd, the best maturity stage for harvesting and the storage condition for harvested pods were studied. According to the proximate composition and physical properties such as weight, length and circumferance of bittergourd pods, the maximum yield was found to be obtained by harvesting after 10th day of flowering. The shelflife of harvested bittergourd was about 5 days at normal condition and the shelflife was found to be extended upto 30 days by packing in polypropylene bags and storing at $2^{o}C$ (35.6^{o} F).

The dehydrated products of these three vegetables exhibited very poor qualities with respect to the retention of chemical constituents and textural qualities. These vegetables contain more than 90% of moisture and removal of this moisture content affected the textural quality of the final products. The microscopic examination of the dehydrated vegetables also showed irreversible changes of cellular structure of the tissues. Therefore, the dehydration ratio of dried vegetables was less than 5.

A natural convective solar dryer was constructed and it was found that the dryer was able to dehydrate vegetables while retaining 76.6% of β-carotene. This amount is significantly higher when compared with the β-carotene content retained in vegetables dehydrated by exposing to direct sun light. The latter process showing only trace amount of β-carotene.

The effect of pretreatments on the quality of processed vegetables were examined. Blanching was found to be an effective pretreatment in retaining ascorbic acid and β-carotene content of these vegetables. The retention of ascorbic acid was increased when the blanching solution contained 0.1% KMS (Potassium meta bisulphite). In the case of frozen bittergourd, the retention of ascorbic acid was 87.7 % in the sample blanched in 0.1 % KMS solution and at storage for 28 weeks at -18°C (-0.4°F).

Of these three vegetables, snakegourd and ridgegourd could be preserved by fermentation. The fermentation was carried out by providing the growth of naturally present lactic acid producing organisms on these comodities and the process was able to reach the 1% acid in the media within 12 days of fermentation. During this period, the total soluble sugar content was found to decrease by 90.8 % in snakegourd and 94.0 % in ridgegourd. In the case of bittergourd, the fermentation was incomplete and the production of acid did not exceed 0.5 % during 12 days of fermentation. However, the development of a new product was possible by preserving bittergourd in acid-salt suspension. In this preservation, the ascorbic acid content was found to reduce gradually during storage, and at the end of the 6th month, the retention of ascorbic acid was 32.5 %. The variation of β-carotene in fermented vegetables was similar to frozen products. The overall results showed the possibility of preserving these three vegetables by freezing or fermentation. Dehydration possibilities exist with respect to bittergourd compared to snakegourd and ridgegourd.

TABLE OF CONTENTS

Page

ABSTRACT xvii

LIST OF FIGURES x

LIST OF TABLES viii

1 INTRODUCTION 1

1.1 GENERAL INTRODUCTION 1

1.2 POSTHARVEST CHANGES 13

1.2.1 Physiochemical changes 13

1.2.2 Nutritional changes 19

1.2.3 Textural changes 29

1.2.4 Pathological aspects 31

1.3 PROCESSING OF VEGETABLES 35

1.3.1 Preservation of vegetables by processing 35

1.3.2 Preparation of vegetables for processing 36

1.3.3 Blanching as a pretreatment of vegetable processing 38

1.3.4 Sulphiting of vegetables before processing 40

1.3.5 Preservation of vegetables by freezing 42

1.3.6 Dehydration of vegetables 43

1.3.7 Fermentation of vegetables 45

2 EXPERIMENTAL 48

2.1 METHOD OF ANALYSIS 48

2.1.1 Determination of dry matter content 48

2.1.1.1 Materials and equipments 48

2.1.1.2 Method 48

Page
2.1.2 Determination of acidity (Titrable) 49
    2.1.2.1 Materials and equipments 49
    2.1.2.2 Method 49
2.1.3 Determination of drip loss 50
    2.1.3.1 Materials and equipments 50
    2.1.3.2 Method 50
2.1.4 Determination of acid detergent fiber 50
    2.1.4.1 Materials and equipments 50
    2.1.4.2 Method 51
2.1.5 Determination of alcohol insoluble solids and total soluble sugar content 51
    2.1.5.1 Materials and equipments 51
    2.1.5.2 Method 52
2.1.6 Determination of chlorophyll content 54
    2.1.6.1 Materials and equipments 54
    2.1.6.2 Method 54
2.1.7 Determination of β-carotene content 56
    2.1.7.1 Materials and equipments 56
    2.1.7.2 Method 57
2.1.8 Determination of ascorbic acid content 58
    2.1.8.1 Materials and equipments 58
    2.1.8.2 Method 58
2.1.9 Determination of peroxidase activity 60
    2.1.9.1 Materials and equipments 60
    2.1.9.2 Method 60

Page

2.1.10 Determination of protein content 61

2.1.10.1 Materials and equipments 61

2.1.10.2 Method 61

2.1.11 Determination of minerals 62

2.1.11.1 Materials and equipments 62

2.1.11.2 Method 63

2.1.12 Determination of rehydration ratio 64

2.1.12.1 Materials and equipments 64

2.1.12.2 Method 64

2.1.13 Microscopic examination of the tissue srtucture 65

2.1.13.1 Materials and equipments 65

2.1.13.2 Method 65

2.1.14 Sensory analysis 66

2.1.14.1 Materials and equipments 66

2.1.14.2 Method 66

2.2 MATURITY AND POSTHARVEST STUDIES OF BITTERGOURD 66

2.2.1 Maturity studies 66

2.2.1.1 Materials and equipments 66

2.2.1.2 Method 66

2.2.2 Postharvest studies 67

2.2.2.1 Materials and equipments 67

2.2.2.2 Method 68

Page
2.3 PROCESSING OF VEGETABLES 69
  2.3.1 Sample preparation 69
    2.3.1.1 Materials and equipments 69
    2.3.1.2 Method 70
  2.3.2 Estimation of blanching time 70
    2.3.2.1 Materials and equipments 70
    2.3.2.2 Method 72
  2.3.3 Solar dehydration 72
    2.3.3.1 Construction of basic solar dryers 72
      2.3.3.1.1 Materials and equipments 72
      2.3.3.1.2 Method 72
    2.3.3.2 The effect of solar dryers on dehydration of bittergourd 74
      2.3.3.2.1 Materials and equipments 74
      2.3.3.2.2 Method 74
    2.3.3.3 Construction of natural convective solar dryer 75
      2.3.3.3.1 Materials and equipments 75
      2.3.3.3.2 Method 75
    2.3.3.4 Study of thermal performance of natural convective solar dryer 77
      2.3.3.4.1 Materials and equipments 77
      2.3.3.4.2 Method 77
    2.3.3.5 Effect of natural convective solar dryer on dehydration of snakegourd 78
      2.3.3.5.1 Materials and equipments 78
      2.3.3.5.2 Method 79

Page
2.3.4 Mechanical dehydration 79
  2.3.4.1 Dehydration of bittergourd 79
    2.3.4.1.1 Materials and equipments 79
    2.3.4.1.2 Method 80
  2.3.4.2 Dehydration of snakegourd 81
    2.3.4.2.1 Materials and equipments 81
    2.3.4.2.2 Method 81
  2.3.4.3 Dehydration of ridgegourd 82
    2.3.4.3.1 Materials and equipments 82
    2.3.4.3.2 Method 82
2.3.5 Freezing preservation 82
  2.3.5.1 Freezing preservation of bittergourd 82
    2.3.5.1.1 Materials and equipments 82
    2.3.5.1.1 Method 83
  2.3.5.2 Freezing preservation of snakegourd 83
    2.3.5.2.1 Materials and equipments 83
    2.3.5.2.2 Method 83
  2.3.5.3 Freezing preservation of ridgegourd 83
    2.3.5.3.1 Materials and equipments 83
    2.3.5.3.2 Method 83
2.3.6 Fermentation of vegetables 84
  2.3.6.1 The production of acid during fermentation of vegetables 84
    2.3.6.1.1 Materials and equipments 84
    2.3.6.1.2 Method 84

Page

2.3.6.2 Fermented pickle of snakegourd 84
    2.3.6.2.1 Materials and equipments 84
    2.3.6.2.2 Method 86

2.3.6.3 Fermented pickle of ridgegourd 87
    2.3.6.3.1 Materials and equipments 87
    2.3.6.3.2 Method 87

2.3.6.4 Nonfermented pickle of bittergourd 87
    2.3.6.4.1 Materials and equipments 87
    2.3.6.4.2 Method 87

3 RESULTS & DISCUSSION 89

3.1 MATURITY AND POSTHARVEST STUDIES OF BITTERGOURD 89
    3.1.1 Maturity studies 89
    3.1.2 Postharvest studies 93

3.2 ESTIMATION OF BLANCHING TIME 97

3.3 SOLAR DEHYDRATION 99
    3.3.1 Effect of basic solar dryers on dehydration of bittergourd 99
    3.3.2 Study of thermal performance of the natural convective solar dryer 102
    3.3.3 Effect of natural convective solar dryer on dehydration of snakegourd 104

3.4 MECHANICAL DEHYDRATION 106
    3.4.1 Dehydration of bittergourd 106
    3.4.2 Dehydration of snakegourd 111
    3.4.3 Dehydration of ridgegourd 116

3.5 FREEZING PRESERVATION 119
    3.5.1 Freezing preservation of bittergourd 119

Page

3.5.2 Freezing preservation of snakegourd 126

3.5.3 Freezing preservation of ridgegourd 134

3.6 FERMENTATION OF VEGETABLES 142

3.6.1 Production of acid during fermentation of vegetables 142

3.6.2 Fermented pickle of snakegourd 146

3.6.3 Fermented pickle of ridgegourd 154

3.6.4 Preservation of bittergourd in acid-salt suspension 159

CONCLUSION 163

REFERENCES 167

APPENDIX 1 177

2 179

3 181

4 183

5 185