

Effects of fermentation followed by solar-drying of leafy vegetables: I. Betacarotene levels

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1.0. Introduction

Over two billion people are at risk of vitamin A deficiency, globally. In Kenya, levels of micronutrient malnutrition are high with 76 per cent of preschoolers manifesting vitamin A deficiency. Leafy vegetables represent quality nutrition for large segments of the population. They supply most of the required vitamins, essential minerals and fibre. When leafy vegetables are stored for long, there is loss of betacarotene (pro-vitamin A).

1.1. Objectives

1. Determination of betacarotene levels in raw and in fermented and solar-dried leafy vegetables
2. Determination of the sensory and acceptability of the processed products
3. Determination of the keeping quality of the products

2.0. Methodology

Existing methods for preservation of African leafy vegetables involve blanching and solar-drying (control). In this study, the leafy vegetables were fermented, blanched, solar-dried, packaged and stored. There was an experimental probe where leafy vegetables were acidified. The processed vegetables were stored for three months and packaged using polyethylene bags or kraft bags.

3.0. Results

There was 91% retention of beta-carotene in fermented followed by solar-dried leafy vegetables after processing. The control had retained only 58% while the probe had retained 61%. The retention of beta-carotene depends on other fermentation factors apart from the lowering of the pH. (Fig.2 and 3)

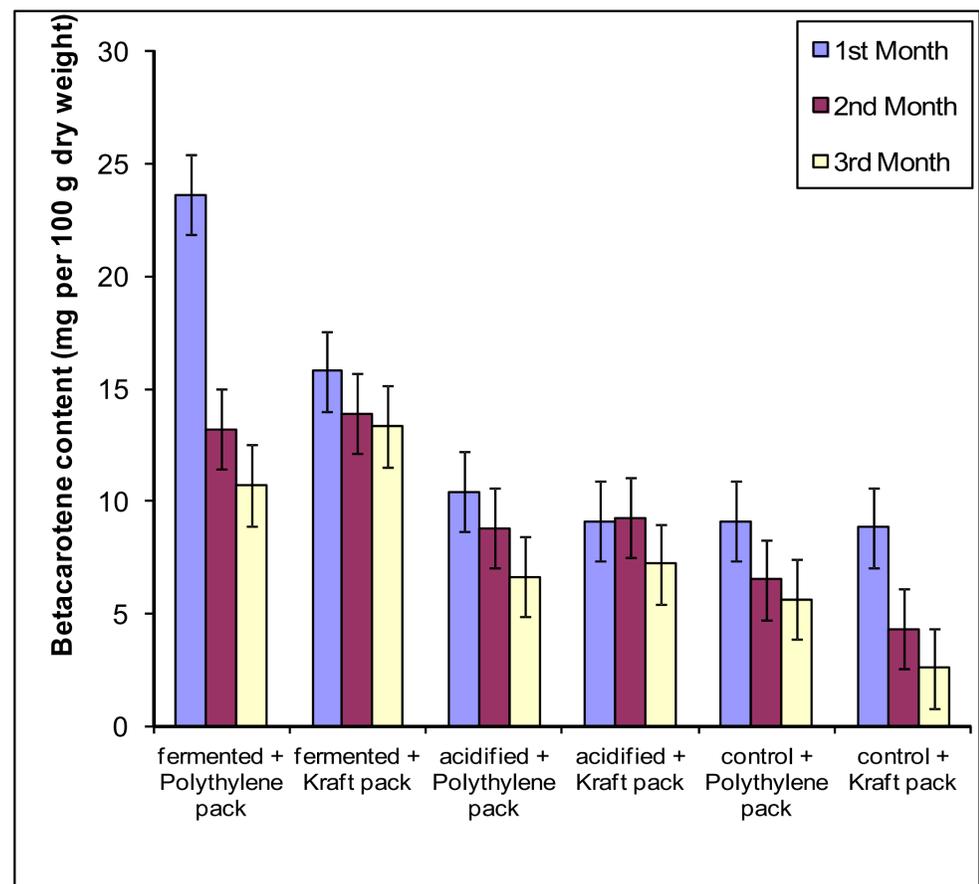


Figure 2

Interaction effect between processing pH, packaging material and duration of storage ($P = 0.005$).

Y-error bars represent Fisher's Least Significant Difference (LSD) at $P = 0.05$.

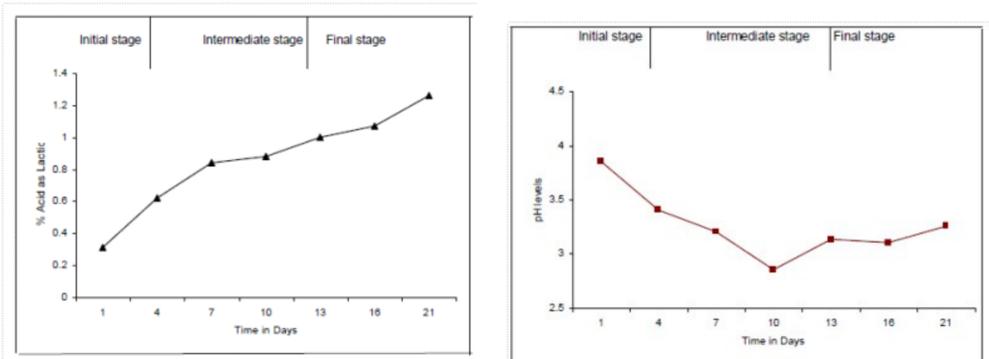


Figure 3

(a) Acid development and (b) pH changes ; during spontaneous fermentation of leafy vegetables

4.0. Conclusion and Recommendations

This study presents a novel procedure for preserving high levels of beta-carotene in processed leafy vegetables. The factors involved and the modes of action are being investigated in this study.

5.0. Acknowledgements

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6.0. References

MUCHOKI-MUSEMBI, C. N. (2013). Effects of fermentation, pH and storage on vitamin content, anti-nutrients and anti-oxidant activity of three solar-dried African leafy vegetables. PhD Thesis (Draft). University of Nairobi



Figure 1

Photograph of the solar drier used in the experiment.