

## EFFECTS OF ALOE VERA BASED EDIBLE COATING ON SHELF LIFE AND QUALITY OF TOMATOES

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### Abstract

*This study investigated the feasibility of aloe vera based edible coating on the shelf life and quality parameters of unripe tomatoes. It assessed the storability and the microbiological qualities of uncoated and coated tomatoes. The control and coated samples were stored at room temperature 25°C-30°C and relative humidity of 82-84%. The microbial and fungi counts of the uncoated samples were comparably higher than those of the coated samples. For the uncoated samples, the bacterial count ranged between  $10 \times 10^3$  cfu/g and  $13 \times 10^3$  cfu/g and  $4 \times 10^3$  cfu/g and  $6 \times 10^3$  cfu/g for fungal count, while for the coated, it ranged between  $6 \times 10^3$  cfu/g and  $8 \times 10^3$  cfu/g for bacterial count and  $3 \times 10^3$  cfu/g remains for fungal count between the 2<sup>nd</sup> and the 4<sup>th</sup> week. For the storability, it was found that the control sample began to deteriorate in quality and begin to show sign of decay from the 2<sup>nd</sup> week, on getting to the 4<sup>th</sup> week, the control was totally damaged while for the coated sample, the tomatoes remained fresh and healthy. In terms of the physiological weight loss for the uncoated, there was a percentage weight loss of 45.754% at the end of the 4<sup>th</sup> week, while for the coated, percentage weight loss was observed and determined to be 13.137% at the end of that same 4<sup>th</sup> week, finally for the chroma value, there was a significant change in the chroma value of the uncoated sample during the 4<sup>th</sup> week of storage, as it reads 44.933 which shows that there is a significant color change from the shiny red to faded red, while for the coated sample, the chroma value during the 4<sup>th</sup> week of storage was 66.581, which showed a much more bright color, as compared to the uncoated sample. Thus, the use of aloe vera based edible coating is highly recommended for storing and extending the shelf life of fresh tomatoes fruit.*

**Keywords:** Bacterial count, edible coating, chroma value, shelf life, tomatoes, aloe vera.

### 1. Introduction

Tomatoes are one of the most healthy and beneficial foods in daily diets. They are extremely low in calories, rich in vitamin A and vitamin C, beta-carotene, potassium, as well as a great source of fundamental antioxidants, such as lycopene. Tomatoes are considered to be one of the most economically important crops in the world. Economically speaking, tomatoes are worth a tremendous amount of money because they give more yields (Chaudhary *et al.*, 2018).

Nigeria is one of the leading producers of tomatoes that are grown in its diverse agro-ecological zones that range from humid in the southern part of the country to sub-humid in the middle belt part of the country and semi-arid/arid in the northern part, yet the produce is lost at an increasing high and alarming rate of 30% - 50% yearly as a result of poor pre-harvest and post-harvest practices (Aworh, 2010) including storage.

Nigeria is ranked the second largest producer of tomato in Africa and the thirteenth largest in the world, producing about 1.701 million tons of tomato annually at an average of 25-30 tons per hectare (Adebisi-Adelani and Oyesola, 2014). Despite this advantageous situation, Nigeria imports processed tomato paste to the tune of about 65,809 tons valued at ₦11.7 billion (\$77.167 million) annually (Ayodele *et al.*, 2007) because not less than fifty per cent (50%) of the tomato produced in the country is lost due to lack of