

MICROBIOLOGICAL ANALYSIS OF STRAWBERRIES AFTER TREATMENT WITH OZONE

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Abstract

The strawberry (*Fragaria ananassa* Duch) is a fruit originally from Europe and rich in vitamins such as vitamin A, C, E, B5 and B6. Among several strawberry species, *Fragaria* is the most common and it is cultivated in many parts of the world. The consumption and the search for a healthier diet led consumers to be concerned with the quality of this product in natura. Thus, this project aims to determine an appropriate concentration of ozone to reduce microbial activity in the strawberry surface without damaging the scarf-skin. The concentrations used in the tests were 0, 0.5, 1.0 and 1.5 ppm of ozone in atmospheric air. They were applied to strawberries, kept under refrigeration at 5°C, with periodic quality evaluations for 10 days. Several microorganisms expressed themselves during the storage period, but various of those ozone concentrations applied were effective according to the microorganism.

Key words: *Fragaria ananassa* Duch, microbiology, ozone

Introduction

Recently, there has been great demand for a healthier diet using food products of high nutritional value and in natura. The strawberry (*Fragaria ananassa* Duch) is a highly perishable fruit and rather expensive. Consequently, the most important problems of this culture are those relating to packaging, transportation and storage¹. However, with the great demand for fresh foods, questions have arisen about safety and propagation of microorganisms on their surfaces. Thus, this study aimed to determine an appropriate concentration of ozone to reduce microbial activity on the strawberries surface without damaging the scarf-skin.

Results and Discussion

Strawberries were purchased from Campinas Supply Center (CEASA). The samples were sent to the Postharvest Technology Laboratory (FEAGRI/UNICAMP), where the ones who presented no mechanical damage were selected to receive ozone treatments at concentrations of 0, 0.5, 1.0 and 1.5 ppm. After application of ozone, fruits were stored in BOD at 5°C for 10 days.

Microbiological analyzes were performed for determination of yeasts and molds, mesophilic and psychrotrophic, expressed in CFU ml⁻¹ (colony forming units) and total coliforms expressed in MPN (most probable number)².

After the end of the storage period, the following results were observed: the reduction of molds and yeasts was more significant in strawberries exposed to 0.5 ppm ozone. The final mesophilic bacteria counts were lower for the treatments 0.5 and 1.5 ppm, while for psicotropic the most effective treatment was 1.0 ppm. For the control coliform the most effective treatment was the one with the highest ozone concentration (Table 1).

Table 1. Quantification of microorganisms at the beginning and end of the storage period strawberries*.

Analysis	Treatments							
	Control		0.5 ppm		1.0 ppm		1.5 ppm	
	I	F	I	F	I	F	I	F
Yeast and Molds	I**	29	I**	3.4	I**	10	I**	5,6
Mesophilic	I**	7.0	I**	0.2	I**	0.5	I**	0.2
Psychrotrophic	6.1	3.5	6.1	1.9	6.1	-	6.1	2.6
Coliforms	1,100	75	1,100	3.6	1,100	7.4	1,100	-

* Count of mesophilic, psychrotrophic, molds and yeasts expressed in 104 CFU ml⁻¹ = Colony Forming Units; Coliform bacteria expressed in MPN = Most Probable Number. - Average of three replications;

**Countless; I = Initial; F = End

Conclusions

It follows that the ozone application is effective in reducing microorganisms in strawberries and that each kind of microorganism demands a suitable concentration.

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¹HENRIQUE, C.M. CEREDA M.P. Utilização de biofilmes na conservação pós-colheita de morango (*Fragaria Ananassa* Duch) cv IAC Campinas. *Ciência e Tecnologia de Alimentos*, v. 19, n. 2, p. 231-233, 1999.

²DOWNES, F.P.; ITO, K. *Compendium of Methods for The Microbiological Examination of Foods*. 34a Ed, American Public Health Association, Washington, USA. 2001.