

EVALUATION OF FRESH AND PRESERVED FRUIT JUICE (BANANA)

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ABSTRACT

This project work compared the effect of pasteurization and chemical preservative on the shelf life of banana drink. The chemical preservatives used were sodium metabisulphate and sodium benzoate at the permitted concentration of 0.1%w. analysis were carried out with respect to pH sensory evaluation and sugar content. The fruit were prepared using a modified local method the organism isolated was yeast and coliform. A taste panel of three (3) persons conversant with the fruit was used to rank the acceptability of the fruit juice based on taste. The fruit juice has able to stay on the shelf for a period of fourteen (14) days after which undergoes deterioration. The use of sodium benzoate as a preservative was found to be better than sodium metabisulphate. Pasteurization at 65% for thirty five (35) minutes has a remarkable impact on the keeping quality of the fruit juice and it is recommended as ideal for preserving banana juice since most of the chemical potential carcinogens.

INTRODUCTION:

Fruit is a seed bearing structure of a flowering plant; a fruit is actually a ripened ovary, a compound of the flowering female reproductive structure. In botany, a fruit is a part of a flowering plant that develops from specific tissue of the flowering, mainly one or more ovaries. Fruit are the means by which many plants disseminate seeds. Most fruit (fresh) are high in water content, low in protein and low in fat. In these cases water content will generally be greater than 70% and frequently greater than 85%. Fruit is also a very important sources of mineral and certain vitamins especially vitamin A and C which are found particularly in the yellow orange fruits. According to Emiovwo (2007), who compared the effect of pasteurization, on the shelf life of banana and pineapple drink. She used the chemical preservatives sodium metabisulphite and sodium benzoate at the permitted concentration of 0.1%W. Her analyses were carried out with respect to the following parameters. pH, Titratable acidity, acidity, microbial load, Organoleptic properties, vitamin C determination.

METHODOLOGY:

The banana extract used for the project was prepared and produced under laboratory condition. The raw materials were sourced from Effurun Market in Effurun, Delta State. The fruit was washed, peeled and stored in a cool place prior to extraction.

COLLECTION AND TREATMENT

A freshly harvested banana was obtained from Effurun Market, in Effurun, Delta State the fruit was washed, peeled and blended.

The chemical preservatives used include sodium metabisulphite ($\text{Na}_2\text{S}_2\text{O}_5$) and sodium benzoate ($\text{C}_6\text{H}_5\text{COONa}$). A calculated amount of the preservative (0.37g) in 250ml of the juice was dissolved directly in the measured fruit juice to be determine.

pH DETERMINATION

In determine the pH of the fruit juice water proof meter was used. The pH electrode was inserted into a clean beaker containing the juice and the result was read from the monitor.

VITAMIN C 10ml of the pasteurized fruit juice was pipetted into a conical flask. 5ml of 2MHCl and 5ml of 2MCCl₄ was added to the sample and was mixed vigorously to allow for homogeneity. The solution was then titrated slowly with 0.1MKClO₃ until a permanent faint pink colour was observed. 10ml of sample preserved with sodium metabisulphite was pipetted into a conical flask. Then 5ml of 2MHCl and 5ml of 2MCCl₄ was added to the sample and was mixed vigorously to allow for homogeneity. The solution was then titrated slowly with 0.1MKClO₃ until a permanent faint pink colour was observed.

10ml of sample preserved with sodium benzoate was pipetted into a conical flask. Then, 5ml of 2MHCl and 5ml of 2MCCl₄ was added to the sample and was mixed vigorously to ensure homogeneity. The solution was then titrated slowly with 0.1KClO₃ until a permanent faint pink colour was observed.

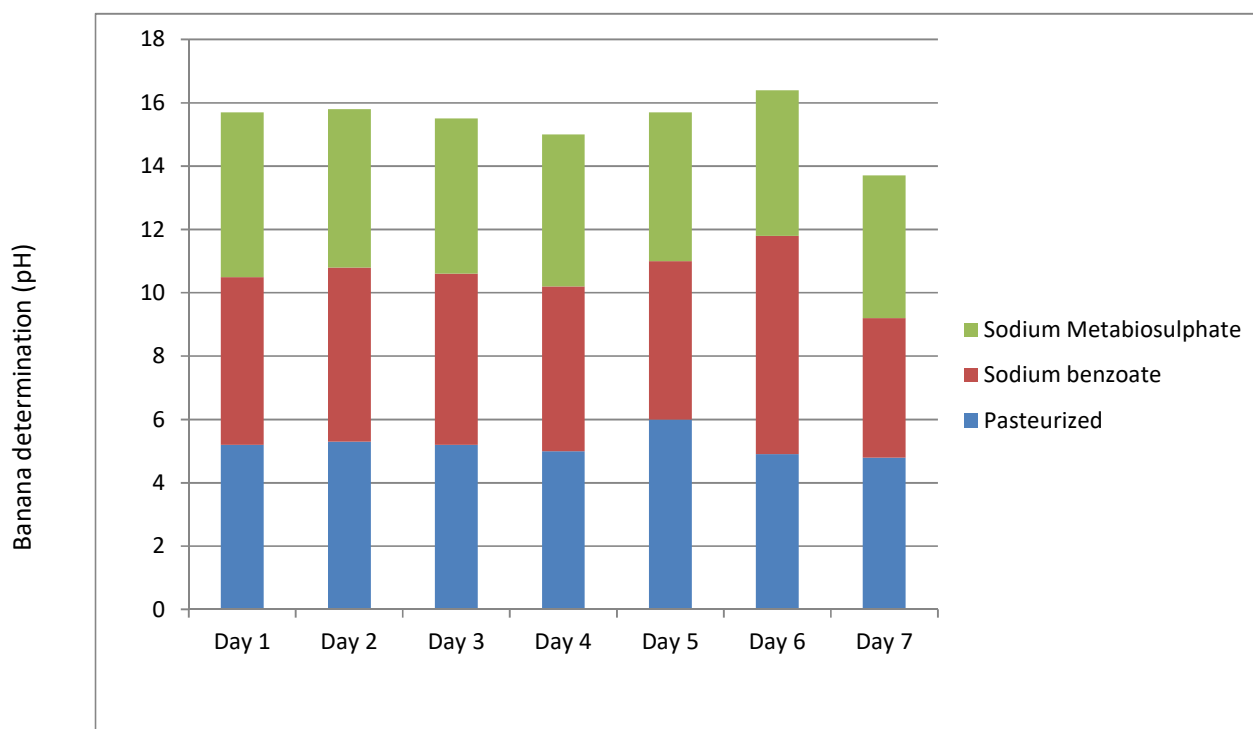
RESULT AND DISCUSSION

pH DETERMINATION OF BANANA JUICE WITH TWO DAYS INTERVAL DAYS

TABLE 1: RESULT OF ANALYSIS OF BANANA JUICE

Days	Pasteurized	Sodium Benzoate	Sodium meta Bisulphate
1.	5.2	5.3	5.2
2.	5.3	5.5	5.0
3.	5.2	5.4	4.9
4.	5.0	5.2	4.8
5.	6.9	5.0	4.7
6.	4.9	4.9	4.6
7.	4.8	4.6	4.5

FIGURE 1: GRAPH OF pH AGAINST NUMBER OF DAYS



SUGAR CONTENT FOR BANANA

TABLE 2: RESULT OF SUGAR CONTENT FOR BANANA JUICE

Days	Pasteurized	Sodium Benzoate	Sodium metal Bisulphate
1.	236	235	239
2.	200	218	200
3.	191	200	196
4.	171	162	180
5.	130	142	150
6.	120	120	130
7.	81	110	110

FIGURE 2: GRAPH OF SUGAR CONTENT AGAINST NUMBER OF DAYS

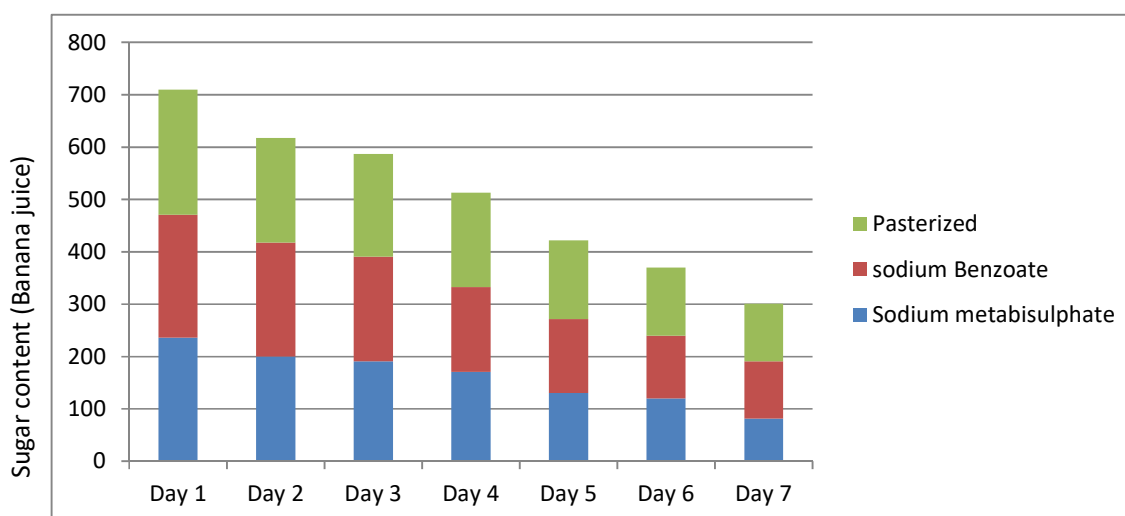


Table 2: Shows the result of the sugar content for the chemically preserved and pasteurized sample. The sugar level for pasteurized sample was 239mg/dl for the chemically preserved samples sodium benzoate the sugar level was 235mg/dl while sample preserved with sodium metabisulphate was 236mg/dl during the process of pasteurization the sugar level was high (pasteurization did not affect the sugar level) but after the sample was pasteurized for four times with an interval of 7 days the sugar level decline each day. The decrease in the sugar level in the pasteurized and chemically preserved sample was due to the actions of various micro organisms which might have survived the preservation period, pH acidity and also due to enzymatic browning which is often catalysed by the polyphenol oxidase. Again the utilization of sugar by the bacteria lead to the production of acid which make the juice to have sour taste due to the presence of lactic acid and bubbles as seen in the samples. These result are in agreement with the findings of Bajawa et al (2003).

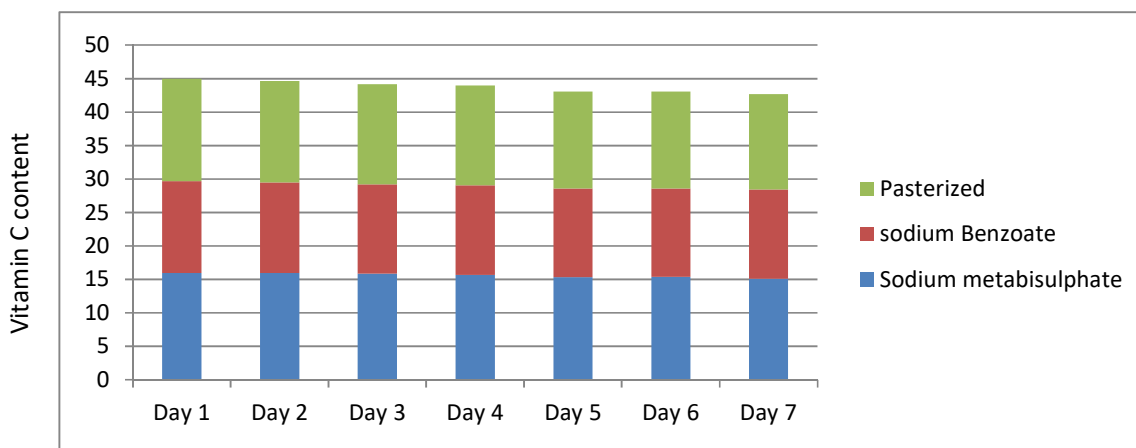
CONCENTRATION IN g/dm³ OF VITAMIN OF BANANA JUICE

TABLE 3. RESULT OF CONCENTRATION IN g/dm³ OF VITAMIN OF BANANA JUICE

Days	Pasteurized	Sodium Benzoate	Sodium metal Bisulphate
1.	15.93	13.73	13.31
2.	15.93	13.55	13.14
3.	15.84	13.37	14.96
4.	15.66	13.37	14.96
5.	15.31	13.28	14.43

6.	15.4	13.2	14.43
7.	15.05	13.37	14.26

FIGURE 3: GRAPH OF VITAMIN C (g/dm³) CONTENT AGAINST NUMBER OF DAYS



DISCUSSION

The result show that both chemically preserved and pasteurized sample, there was a difference in the vitamin content with fluctuation as the storage period increase due to deterioration. Also the presence of yeast and coliform result in fermentation which break down the vitamin content. Microbial fermentation of juice may result in enrichment of the nutrient in the juice and also in depletion of the nutrient in some cases. The result are in agreement with the findings of Khan (1987) who also reported loss of vitamin C during storage in banana juice preservation.

CONCLUSION

From the result obtained, it can be concluded that use of the chemical preservatives has remarkable impact in the keeping quality of the fruit juice however, sodium benzoate is a better preservative than sodium metabisulphate in the preservation of banana juice. It was also observed that the use of preservative have impact on the original colour of the juice thereby changing the colour slightly this was due to be fact that colour stabilizer where not added in conjunction with the fruit juice preservatives.

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