

## A Study to Determine the Vitamin C Content of Fresh and Canned Pineapple

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### Abstract

The study was conducted to compare the vitamin C content of fresh and canned pineapple. Main purpose of this study was to assess the retention of vitamin C in fresh and canned pineapple. This study was conducted in Food and Nutrition Lab of Govt. College of Home Economics.

It was found that fresh pineapple contains greater amount of vitamin C as compared to canned pineapple because heats destroys vitamin C during canning process.

**Keywords:** *Ascorbic acid; Collagen; Antioxidant*

### Abbreviations

RDA: Recommended Dietary Allowance; HPO<sub>3</sub> –HOAC: Meta phosphoric – acetic acid; AA: Ascorbic Acid Solution

### Introduction

Pineapple (*Ananas cosmosus*) is a tropical fruit which grows in countries which are situated in the tropical and sub-tropical regions. It is native to Central and South America. Pineapple belongs to the Bromeliaceous family and grows on the ground. It can grow up to 1m in height and 1.5m wide. Other bromeliads live on trees (epiphytes). There are many cultivars of Ananas, but the predominant one is 'Smooth Cayenne' [1].

Pineapple is an important food which can be eaten fresh or eaten in a processed form. It is composed of nutrients which are good for human health reveals researches carried out on the relationship between nutrients in pineapple and human health [1].

Pineapple mainly contains water, carbohydrates, sugars, vitamins A, C and carotene, beta. It contains low amounts of protein, fat, ash and fibre. Pineapples contain antioxidants namely flavonoids, vitamin A and C. These antioxidants reduce the oxidative damage such as that caused by free radicals and chelating metals [1].

These days as people have shortage of time due to busy lifestyles, they prefer to use canned pineapple as compare to fresh ones because they are ready to use as well have greater shelf life. The use of canned form of pineapple is increasing. Therefore it is important to check the retention of vitamin C in canned as well as fresh pineapple.

### Methodology

This study was conducted to compare the vitamin C content of fresh and canned pineapple. Three samples from fresh and canned pineapple were taken and evaluated in Food and Nutrition lab of Govt. College of Home Economics, Gulberg Lahore.

### Statement of the Problem

- To compare Vitamin C content of fresh pineapple and canned pineapple.

### Objectives

- To determine vitamin C content of fresh pineapple and canned pineapple.
- To compare vitamin C content of fresh pineapple and canned pineapple.

### Delimitations

- Only pineapple was selected to determine and compare vitamin C content.
- Only two samples were selected.
- Only titration method was used to determine vitamin C content.

### Sample Collection

#### Samples

- Sample 1- Fresh pineapple.
- Sample 2- Canned pineapple.

### Chemical Analysis

#### Reagents

- Meta phosphoric – acetic acid ( $\text{HPO}_3$  - HOAC) solution = 1 ml.
- Ascorbic acid standard solution (100mg/100ml) = 1ml.
- 2, 6 dichlorophenol indophenol solution.

#### Apparatus

- Pipette
- Burette
- Conical flask
- Beaker

### Determination of vitamin C

#### Preparation of the Sample

The objective of preparing the sample is to obtain a representative sample that is to be analyzed. It must represent the part or portion required for the purpose.

#### Procedure

1. Take 1 ml of selected sample with the help of a pipette in a 250 ml conical flask.
2. Add 1 ml of ( $\text{HPO}_3$  - HOAC) to conical flask.
3. Add 1 ml standard ascorbic acid solution (1mg/1ml) to it.
4. Titrate rapidly with 2, 6 dichlorophenol indophenol solution from 50 ml buret until light pink color persists for about 5 sec.
5. Note the reading.
6. Repeat the experiment three more times.

#### Environmental Conditions

- Glass wear should be washed properly.
- Readings should be taken carefully.
- Standard solution of ascorbic acid should be freshly prepared.
- Samples should be covered tightly to avoid the evaporation of vitamin C.

**Calculations**

**Standard Solution**

Standard ascorbic acid	1 ml
Metaphosphoric-acetic acid (HPO <sub>3</sub> -HOAC) solution	1 ml
Initial reading	0 ml
Final reading	1.9 ml
Difference	1.9 - 0
	1.9 ml
1 ml of dye contains	1/1.9
	0.5 mg of Ascorbic Acid

**Method for Calculations**

Amount of sample	A ml
Amount of dye used	B ml
1ml of dye contains	0.5mg A.A
B ml of dye is used	A x B
	C mg A.A
A ml of sample contains	C mg A.A
1ml of sample contains	C/A
150ml of sample contains	C/A x 100
	D mg A.A
% Ascorbic Acid in a sample	D/Net Weight x 100
	E%

**Results and Discussions**

Sample	Vitamin C Percentage	Vitamin C/Serving*	Level of Significance	RDA %
1	24.0667 ± 0.68069	57.7600 ± 1.63365	0.000	43.32
2	10.3000 ± 0.30000	24.7200 ± 0.7200	0.000	18.54

Key:

Sample 1 = Fresh Pineapple

Sample 2 = Canned Pineapple

\* 1 Serving = 1 Cup (240 grams) Pineapple

Note:

P value = < 0.05

Mean difference between Vitamin C content of sample 1 and 2 is statistically significant.

The above table shows that fresh pineapple contains greater amount of vitamin C as compared to canned pineapple. One serving of fresh pineapple provides 43.32% of a day’s RDA. This shows that fresh pineapple would provide a considerable amount of ascorbic acid. Therefore the consumption of fresh pineapple should be encouraged.

The canning process affects the nutritive value of pineapple. Heating of cans is a major step of canning procedure. As ascorbic acid is a very sensitive vitamin, it is destroyed during the canning process. According to this study, one serving of canned pineapple will provide

only 18.54% of the RDA of an adult female. This shows that considerable amount of vitamin C has been destroyed during the canning process. On the other hand one serving of canned pineapple provides 109 calories due to added sugar and preservatives while fresh provides only 82 calories.

It can be interpreted from the above table that there is a wide difference between the ascorbic acid content of fresh and canned pineapple. Hence fresh pineapple cannot be substituted at any cost because it has greater number of health benefits.

### Conclusion

Fresh pineapple contains more amount of vitamin C as compared to canned pineapple As there is heat involved in processing of canned pineapple and as vitamin C is a water soluble vitamin, it is readily oxidized and the concentration of ascorbic acid decreases. Of all the vitamins, vitamin C is most easily destroyed during heating hence canned pineapple contains less amount of vitamin C.

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