

Effects of Heat on Vitamin C in Tomatoes

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ABSTRACT

Vitamin C is an important vitamin, and tomatoes are a good source of Vitamin C. Most tomato products we consume have been processed by heat, and we wanted to discover if cooking altered the level of Vitamin C. Our goal was to determine if heating the tomatoes to three different temperatures affects the level of Vitamin. Our hypothesis is that Vitamin contents of tomatoes will decrease when heated because Vitamin C is water soluble and affected by heat.^[1]

Keywords: *Tomatoes, heat, Vitamin C, Titration, Starch Solution.*

I. INTRODUCTION

Tomatoes are rich source of Vitamin C and the papers shows the contents of Vitamin C in different stages of Tomato at different temperatures. This will make people aware about the Vitamin contents of tomatoes and encourage them to consume them according to their needs.

II. MATERIALS

- Early Stage Tomatoes
- Ripen Tomatoes
- Beaker
- Thermometer
- Bunsen Burner
- Starch Solution
- Tincture of Iodine
- Dropper
- Distilled Water.

III.PROCESS OF WORKING

In this method we have used various Stages of Tomatoes like Earlystage(Green Tomato) and ripen tomato(Perfectly-red Tomato).For the testing of Vitamin C levelin the various stages of the tomato, tomatoes solution (with distilled water) are heated at differenttemperatures.Titration method which is the main part of the process is used to check the level of the Vitamin C in the tomatoes.(Titration, also known as titrimetry, is a common laboratory method of quantitative chemical analysis that is used to determine the unknown concentration of an identified analyte. Since volume measurements play a key role in titration, it is also known as volumetric analysis. A reagent, called the titrant or titrator is prepared as a standard solution. A known concentration and volume of titrant reacts with a solution of analyte or titrand to determine concentration. The volume of titrant reacted is called titration volume) In this Titration method ,the Vitamin C in the tomatoes is the titrant and iodine(Iodine Tincture USP) is the titrating solution. After this tomato solution is made by blending the 2 green tomatoes with 200ml of distilled water and in the similar way solution is made for the red tomatoes. Different solution of red and green tomato was made. After this filtration is done of the tomato solution of both red and green tomato to remove the tomatoes seeds and other stuff. 1 sample of 10ml green tomato solution is set aside and 4 samples of the red tomato solution is made in the different beakers.From this 5 samples,1sample of green tomato solution and 1 sample of red tomato solution were kept aside and the 3 samples of red tomato solution are taken for the heating process at the different temperatures. All this 3 samples of red tomato 10ml solution are heated at different temperatures of 50C, 70C and 92C respectively. The heating process is done slowly on the gas stove and the temperature is detected with the help of the thermometer. And the other 1 sample of green tomato solution and 1 sample of red tomato solution kept at room temperature (25C). While the all samples cooled to a standard temperature of 25C, we prepared a starch solution (1T cornstarch and 200mL distilled water). Ten drops of the starch solution were added to each of the four samples and stirred perfectly so that all ten drops should be mixed perfectly in the tomatoes solution. Then we added the titrating solution, iodine (Iodine Tincture USP) one drop at a time to the each sample of tomatoes solution.The number of drops of iodine tincture necessary to change the pink coloured tomato/starch solution to completely black colour were recorded. All the results were recorded. The results of the level of the Vitamin C in each sample are concluded on the basis of the number of drops of iodine required in each sample.

IV.FIGURES AND TABLES:

| Solution type | Solution temperature | Number of iodine drops required |
|---------------|-----------------------|---------------------------------|
| Red tomato | Room temperature(25C) | 5 drops |
| | 50C | 4 drops |
| | 75C | 3 drops |
| | 92C | 2 drops |
| Green tomato | Room temperature(25C) | 6 drops |





V.RESULTS

The presence of Vitamin C in a fresh tomato solution declined after it was heated in the Green Tomato. Early stage tomato took 3 drops of Iodine which was kept at Room Temperature. Green tomato which was at Room Temperature took most-5 drops of Iodine. The samples at 50C, 75C and 92C took 4, 3 and 2 drops of Iodine respectively.

VICONCLUSION

The results showed that Vitamin C in Fresh Green Tomato is highest, while in Red Tomato, decreases with increase in Temperature. Tomatoes that are cooked will have less Vitamin C than raw tomatoes. We also concluded that as the Tomato turns from Green to Red, Vitamin C contents decreases but not by a big amount. So, it is better to consume partly Green Tomato for better consumption of Vitamin C.

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VIII.BOOKS

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2. Antioxidants: Vitamins C and E for Health by Dr. Robert Youngson.
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