# Preservation of tomato (*Lycopersicon esculentum*) by dehydration for product development and utilization

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## Introduction

Tomato growers in the world experience high postharvest losses of fresh tomato supported by high perishability and low price of tomato during the peak production seasons due to production surplus and low product utilization of preserved tomato. Compared to the trends in the food industry the demand for dehydrated tomato is increasing rapidly both in domestic and in international markets (Purseglove *et al.*, 2001). Dehydrated tomato topping is a condiment comprises with dehydrated tomato slices use to enhance the flavor and texture of salads, ranging from simple green salads to more elaborate versions.

Main objective of the study is the Preservation of Tomato (*Lycopersicon esculentum*) by dehydration for product development and product utilization. Specific objectives are dehydration using hot air drying, analysis of sensory, microbial and physiochemical parameters of dried samples and possibility of using dehydrated products for new product development and product utilization.

## Materials and methodology

The material used for this study is just ripen tomato (*Lycopersicon esculentum*) belongs to variety "Pathma".Preliminary studies were carried out to determine the best methods steaming and non-steaming methods. Best salt concentration was selected based upon the microbial counts and the moisture content. Best Sodium Meta bisulphite was selected based upon the organoleptic properties.

10g of dehydrated tomato, 50g of sugar, 400mL of water, 20g of Corn flour, 15mL of vinegar, 10mL of citric acid were used according to the developed methodology. Dehydrated tomato topping with brix value 25 was developed using the methods developed through the preliminary trials. Brix value was adjusted to 25 during cooking. Final product was stored under room temperature in sterilized glass bottles.

The microbial evaluation, proximate analysis, analysis for organoleptic properties and physico - chemical analysis for final product was conducted to ensure the product safety and quality.

## Results and Discussion

### Microbiological tests

Microbiological tests were carried by the Veterinary Research Institute (VRI), Peradeniya to ensure the safety of the final product for the consumers.

Table: Results of the microbiological tests for dehydrated tomato topping with brix value 25

| Microbiological test | Results (CFU/g) |
|---|---|
| *Salmonella* spp. | Negative |
| *Staphylococcus aureus* | Negative |
| *E.coli* | Negative |
| Aerobic Plate Count(APC) | $5.0 \times 10^{0}$ |

Based on the Sri Lankan standards for the microbiological tests the Aerobic Plate Count should be less than $5\times10^{3}$. The absence of the pathogenic bacteria is a requirement of Sri Lankan standards for microbial tests.

**Proximate Composition of the Final Product**

Table: Proximate composition of the final product

| Parameter | Composition |
|---|---|
| Appearance | Normal |
| Moisture % | 73.0 |
| Ash % | 0.1 |
| Crude protein % | 0.5 |
| Ether extract (Fat) | 0.0 |

The most important feature of the product is free from Ether extract. Most toppings are rich in fats. Hence, the developed product is a favorable substitute for toppings rich in fats as a food additive for people who are advised to use fat free diets for therapeutic purposes. The standards for proximate composition of Tomato toppings are not mentioned in Sri Lankan Standards.

**Sensory Data of Shelf Life Evaluation**

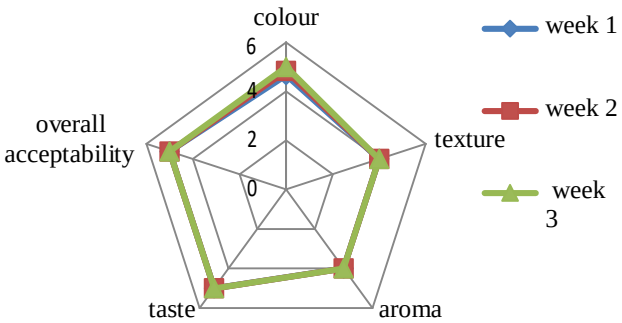


Figure 1: Web diagram illustrates the changeability of sensory attributes with time

The dehydrated tomato topping with the brix value of 25 has obtained the highest acceptability for overall appearance and taste for the duration of three weeks. The acceptability for the aroma and the texture of the product has decreased continuously for three sensory evaluation tests. The acceptability for the colour has increased from week one to week three due to the gradual increment of the brix value, pH and titratable acidity of the product with the time.

**Physico-Chemical Analysis**

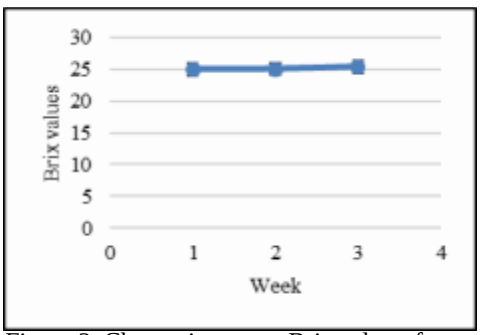


Figure 2: Change in mean Brix value of dehydrated tomato topping during the storage period under refrigerated conditions

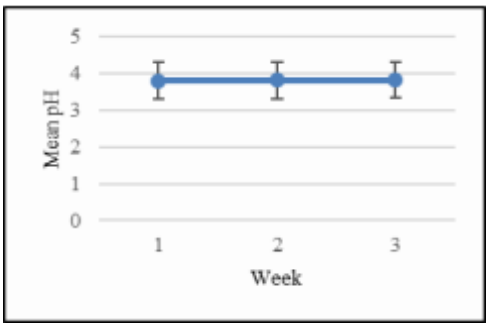


Figure 3: Change in mean pH value of dehydrated tomato topping during the storage period under refrigerated conditions

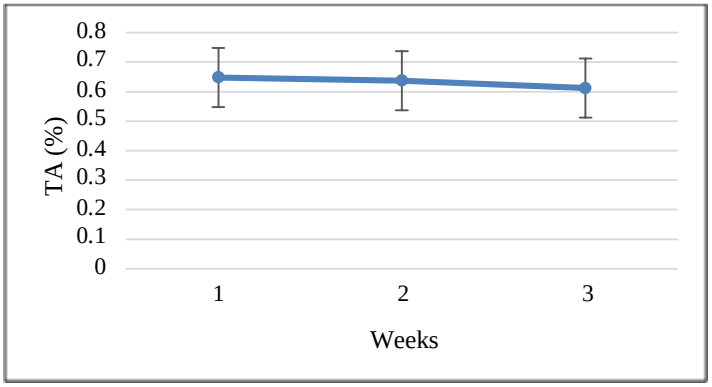


Figure 4: Change in mean TA value of dehydrated tomato topping during the storage period under refrigerated conditions

Brix values and pH values of the final product has increased slightly from first week to third week with the aging of the product while the titratable acidity of the product has decreased. At the end of the third week the pH lays on the value of 3.82.Hence it lays below the value of 4.4 which is recommended as the maximum pH value for the food products. Hence the product is safe for the consumption for three weeks period. The reason for the overall reduction of titratable acidity of the product is the increment of the pH value of the product with aging.

## Conclusion

The preservation of tomato is very much important to address the market gap in between the market demand and supply. Dehydration can be identified as one method of preservation. The tomato samples should be pretreated with 2% salt to enhance the efficiency of the dehydration process. The dehydrated tomato topping with the brix value of 25 gives the best sensory attributes. The brix value is the main parameter adjusted in the dehydrated tomato topping by addition of sugar.50g of sugar is required for the production of 200ml of the dehydrated tomato topping. The pH value is adjusted to the value of 3.8 by addition of citric acid. The pH should be kept below the value of 4.4.The dehydrated tomato topping is a fat free food additive which extends the range of value addition to tomato fruits.

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## References

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