EFFECT OF PRETREATMENTS AND DRYING METHODS ON QUALITY PARAMETERS OF DRIED TOMATO SLICES

1,Pokharkar K. K., 2Delvadia D. V., 1Jadhav P. B. and 1Bhor P. B.
1Scholar, Dept. of Horticulture, JAU, Junagadh, Gujarat-362 001
2Professor, Dept. of Horticulture, JAU, Junagadh, Gujarat-362001

ABSTRACT

The present investigation entitled “Effect of pretreatments and drying methods on quality of tomato slices” was carried out at Post Graduate Laboratory Department of Horticulture, College of Agriculture, Junagadh Agricultural University, Junagadh in factorial completely randomized design with three replications and consists different levels of pre-treatment viz., P1 (Peeled by hot water dip blanching), P2 (Peeled by hot brine dip blanching), P3 (Unpeeled, hot water blanching), P4 (Unpeeled, hot brine blanching) and P5 (Control-Unpeeled, Unblanched) and two drying methods viz., D1 (Tray drying) and D2 (Sun drying). The results of sensory evaluation exhibited that on 1\textsuperscript{st}, 40\textsuperscript{th} and 60\textsuperscript{th} day of storage, P3-D1 secured highest score for sensory characteristics \textit{i.e.} 9, 7.5 and 6.1, respectively, on 20\textsuperscript{th} and 80\textsuperscript{th} day of storage, P3-D2 and P3-D2 recorded highest average score for sensory characteristics \textit{i.e.} 8.1 and 4.6, respectively. Therefore treatment P3-D2 can be suggested to the farmers or post-harvest technocrats for commercial based preparation of tomato slices.

INTRODUCTION

The commercial tomato belongs to a species most frequently referred to as \textit{Lycopersicon esculentum} Mill, a Solanaceous crop. Compared to many other vegetable crops tomato, a native of Central America and South America, has a shorter history of about 400 years (Saravaiya et al., 2014). Tomato is one of the most popular vegetable and ranks first. The fruit is available in the market almost round the year. It is one of the most popular salad vegetables in raw taste and is made into soups, conserves, ketchups, sauces and other products. It is served as raw, baked, stewed, fried and as sauce with various other foods. It is recognized as one of the most important “Protective food” both because of its special nutritive value and also because of its wide production (Choudhary, 2001). It is a perishable crop and cannot be stored safely in normal condition for a long time. Tomato has limited shelf life and presently about 30-40% of the tomato is estimated to be lost during post-harvest operations including handling and storage like decay, over ripening, mechanical injury, weight losses etc.

About 10% of the total tomatoes are being processed and remaining is consumed as fresh vegetables. Fast emerging of food processing industry is changing the lifestyle of population. At least 30-40% of production of fruits and vegetables in country is lost due to improper post-harvest handling. The post-harvest losses estimated to tune of Rs. 23,000 crores per annum. This huge post-harvest loss of valuable horticultural commodities can be checked successfully, if they are processed into different value added products. Processing of tomato into market demanded products becomes very necessary to minimize the glut in the market during its peak season of production. It is treated as a valuable raw material for the preparation of a very wide range of processed products. The demand by the processing industries of the world for tomatoes continues at a high level.

MATERIALS AND METHODS

For this experimentation, a fully ripe, oval shaped and uniform sized tomato fruits of cv. GT-1 were selected. Unripe, diseased, damaged and off type fruits were strictly discarded. Well matured, fully developed and red colored tomato fruits were selected and washed thoroughly with fresh tap water and peeled manually after giving the hot brine (2.5%), hot water (100°C) and blanching pre-treatments to the fruits for 30
second. The slices of 1 cm thickness with sharp stainless steel knives were prepared and then it was kept on a stainless steel sieve for a few minutes for draining excess juice and then spread it uniformly on tray for drying in sun and cabinet tray drier. Trays with ripe tomato slices were loaded in cabinet tray drier and temperature of 60°C for initial 3 hours was maintained. After 3 hours, temperature was reduced to 40°C, to minimize the deterioration of quality caused due to high temperature. Trays with raw tomato slices were kept under sun from 9.00 a.m. to 5.00 p.m. and were covered with the double layer muslin cloth to avoid the direct heat to the slices. After drying of slices, it was packed in 200 guage polythene bags and stored at ambient storage in Laboratory.

During the storage, the observations of the dried slices were recorded for its changes in chemical properties at every 20 days interval. Soup as a processed product was prepared from the stored dried slices at every 20 days interval and evaluated for its sensory attributes by appointing the five-member expert panel up to the spoilage occurred. The experimental data were analyzed statistically according to the analysis of variance technique as suggested by Panse and Sukhatme (1985).

Treatment combinations

The details of the pre-treatments, drying methods adopted and its combinations are given below.

Pre-treatments

Factor A (Pretreatments)

- \( P_1 \) – Peeled by hot water dip blanching
- \( P_2 \) – Peeled by hot brine dip blanching
- \( P_3 \) – Unpeeled, hot water blanching
- \( P_4 \) – Unpeeled, hot brine blanching
- \( P_5 \) – Control (Unpeeled, Unblanched)

Factor B (Drying methods)

- \( D_1 \) – Tray drying
- \( D_2 \) – Sun drying

Treatment combinations

| \( P_i D_j \) | Treatment 
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>( P_1 D_1 )</td>
<td>Peeled by hot water dip blanching + Tray drying</td>
</tr>
<tr>
<td>( P_1 D_2 )</td>
<td>Peeled by hot brine dip blanching + Tray drying</td>
</tr>
<tr>
<td>( P_2 D_1 )</td>
<td>Unpeeled, hot water blanching + Tray drying</td>
</tr>
<tr>
<td>( P_2 D_2 )</td>
<td>Unpeeled, hot brine blanching + Tray drying</td>
</tr>
<tr>
<td>( P_3 D_1 )</td>
<td>Control (Unpeeled, Unblanched) + Tray drying</td>
</tr>
<tr>
<td>( P_3 D_2 )</td>
<td>Control (Unpeeled, Unblanched) + Sun drying</td>
</tr>
<tr>
<td>( P_4 D_1 )</td>
<td>Peeled by hot water dip blanching + Sun drying</td>
</tr>
<tr>
<td>( P_4 D_2 )</td>
<td>Peeled by hot brine dip blanching + Sun drying</td>
</tr>
<tr>
<td>( P_5 D_1 )</td>
<td>Unpeeled, hot water blanching + Sun drying</td>
</tr>
<tr>
<td>( P_5 D_2 )</td>
<td>Unpeeled, hot brine blanching + Sun drying</td>
</tr>
<tr>
<td>( P_5 D_3 )</td>
<td>Control (Unpeeled, Unblanched) + Sun drying</td>
</tr>
</tbody>
</table>

RESULTS AND DISCUSSION

On 1\textsuperscript{st} day of storage (Fig. 1), \( P_1 D_1 \) secured highest score \( i.e. 9 \) for colour, flavour and taste, while minimum score was registered in \( P_5 D_3 \) which was 7.1.

On 20\textsuperscript{th} day of storage (Fig. 2), \( P_1 D_1 \) and \( P_3 D_1 \) recorded highest average score for sensory characteristics \( i.e. 8.1 \) while, lowest average score (6.5) was recorded in \( P_1 D_2 \). On 40\textsuperscript{th} day of storage (Fig. 3), \( P_1 D_1 \) secured highest average score \( i.e. 7.5 \), while the lowest score \( i.e. 5.5 \) was secured by \( P_2 D_2 \) and \( P_3 D_2 \). On 60\textsuperscript{th} day of storage (Fig. 4), \( P_1 D_1 \) secured maximum average score \( i.e. 6.1 \), while minimum average score \( i.e. 4.1 \) was recorded for \( P_2 D_2 \). On 80\textsuperscript{th} day of storage (Fig. 5), the \( P_1 D_1 \) and \( P_2 D_1 \) recorded highest average score for colour, flavour and taste \( i.e. 4.6 \), while, \( P_1 D_2 \) recorded minimum average score \( i.e. 3.3 \).

The sensory score decreased continuously with increase in storage period. This might be due to degradation chemical constituents. The flavour and colour losses also occurred due to chemical reactions, particularly non enzymatic browning. A slight difference in scores of tomato. Soup prepared with fresh and dehydrated tomato was observed with the latter showing lower score. This could be probably due to destruction of cellulose macro molecules in dehydrated products and softening due to loss of turgor pressure.

Similar reports were reported by Gupta and Nath (1984). The soup as a processed product from dried and dehydrated tomato slices was prepared. The tomatoes which were blanched by hot brine and dried in cabinet drier had the acceptable scores than sun dried tomato slices.

Chaturvedi et al. (2003) prepared tomato rice, tomato dhal and curry with dried and dehydrated tomato slices. The cabinet
dried tomato and recipes with it secured maximum organoleptic scores.

**Conclusion**

From the forgoing discussion it concluded that combination peeled by hot brine dip blanching + Tray drying was found best as per sensory evaluation. Therefore treatment Peeled by hot brine dip blanching + Tray drying can be suggested to the farmers or post-harvest technocrats for commercial based preparation of tomato slices.

**REFERENCES**


