

Effect of Variety, Harvesting Stage and Breaking Method on the Quality Characteristics of Tomato (*Solanum lycopersicum* L.) Paste

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The objective of this research was to evaluate the effects of the pre-heat treatment (breaking) and harvesting stage on the physico-chemical quality attributes of tomato paste. Tomato breaking temperatures of 60-65 °C (cold-break) and 80-85 °C (hot-break) for 2 minutes and harvesting stages of breaker, light red and red was used to prepare tomato paste. Moreover, tomato pastes developed from “Thilina”, “Bathiya” and “HTH-3” varieties were also evaluated to understand the varietal effect on physico-chemical characteristics of tomato paste. Physico-chemical characteristics of quality attributes such as color (L^* , a^* , and b^* values), pH, titratable acidity (%), viscosity (Pa s^{-1}), lycopene content (mg kg^{-1}), moisture content (%), and ash (%) of tomato paste were evaluated to understand the quality attributes of the different treatments. Breaking methods had a significant effect ($P<0.05$) on pH and the lycopene content ($P<0.05$) of tomato paste. The pH of the hot-break tomato paste was higher than cold-break pastes. The lycopene content of the cold-break tomato pastes was higher than hot-break tomato paste. Tomato paste processed from harvested red-stage tomatoes showed better retention in redness and yellowness of tomato paste. The treatments between the tomato-breaking method and the harvesting stage showed a significant interaction ($P<0.05$) with the viscosity of tomato paste. The highest viscosity of $87.75\pm0.12 \text{ Pa s}^{-1}$ was observed in treatments combination of the red-stage harvesting and hot-break pastes. The lowest viscosity of $57.75\pm0.71 \text{ Pa s}^{-1}$ showed at the red-stage and the cold-break processed tomato paste. The results of the varietal study showed that the tomato variety also had a significant effect ($P<0.05$) on the quality attributes of tomato paste. The findings of this study showed that the cold-break method is more suitable than the hot-break method for the processing of tomato paste. Moreover, harvesting tomatoes at red stage can also be recommended for processing of quality tomato paste.

Keywords: Cold-break, Harvesting stage, Hot-break, Physicochemical properties, Tomato paste

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