CHAPTER 7

CONCLUSIONS
The present study is based on the development of new types tomato puree treated with turmeric and lime (CaO) and fortified with lemon juice (citrus lemonii), beet root puree, culinary herbs to improve the colour, flavor, texture and product variety.

As calcium containing salts and liming materials are used by the cultivators since 1940s to improve the textural properties of tomatoes and turmeric terms in brick red curcumin in alkaline medium, this idea has been implemented in this study for the treatment purpose. Degradation of red colour of tomato due to enzymatic action during thermal processing is a major challenge of food processing industry which makes the puree less consumable or addition of natural or artificial colour to make it more colourful. During the blanching process, a mixture of turmeric-lime in equal proportion is added in blanching water and the tomatoes were blanched for 1 min, 2 min and 3 min. 2 mins blanching time gave better results in respect to colour, pH and rheological properties. The turmeric-lime mixture were used in the concentration of 0.02% (w/w), 0.04% (w/w), 0.06% (w/w) respectively in 250ml of blanching water of 100gm tomatoes. The 0.04% (w/w) turmeric lime treated sample had shown the acceptable quality.

To import the appropriate pH and to increase the taste of treated tomato puree, lemon juice (citrus lemonii) were added and the puree had shown better results in respect to colour, pH and rheology.

The developed turmeric-lime treated, lemon juice fortified tomato puree samples were analyzed for its nutrient content and sensory analysis were made for its consumers’ acceptability. Amongst all the developed tomato puree samples, 4TLL [.04%(w/w) turmeric lime +5ml lemon juice] were accepted unanimously in respect to colour, flavor, texture and taste.

The shelf life of developed tomato puree samples were determined by plate count method for viable bacterial cell. It has been observed that the lemon juice fortified samples 2TLL [.02%(w/w) turmeric lime+5ml lemon juice] , 4TLL [.04%(w/w) turmeric lime +5ml lemon juice], 6TLL [.06%(w/w) turmeric lime+5ml lemon juice] were having less growth rate than the
2TL[.02%(w/w) turmeric-lime), 4TL[.04%(w/w) turmeric-lime), 6TL[.06%(w/w) turmeric-lime) samples.

In another study, a new type of tomato puree is developed with the addition of beet puree in different proportions in the turmeric lime lemon treated 4TLL sample. The colour, flavor, fluidity and sensory analysis were made on the developed tomato-puree samples mixed with beet puree in different proportions. The tomato puree and beet puree mixed in the proportion of 90:10(tomato+beet), 80:20(tomato+beet), 70:30(tomato+beet), 60:40(tomato+beet), 50:50(tomato+beet), 40:60(tomato+beet), 30:70(tomato+beet), 20:80(tomato+beet), 10:90(tomato+beet). It was observed that L and b value of the mixed tomato and beet puree samples decreased with the increased proportions of beet puree which might be due to the more brightness of lycopene pigment of tomato puree than the belalain pigment of beet puree. The rheological observations show that the yield stress of puree samples increased significantly with the increasing proportions of beet puree in tomato beet puree samples.

Sensory analysis revealed that the addition of beet puree in tomato puree samples were acceptable up to the level of 40g beet puree in 60g tomato puree samples, beyond this, the dislike responses amongst the consumer were shown negative responses.

Tomato puree rich in lycopene, a carotenoid pigment attracted a lot of attention from various researchers because of its nutritional significance and disease prevention such as chronic and cancerous diseases. In another study, with an increasing understanding of health benefit of lycopene, the culinary herbs like tulsi, mint, curry, parsley, coriander leaves were added to the best tomato puree sample (4TLL) to bestow natural antioxidants in the developed sample. Tender leaves of the above culinary herbs were used in grated forms as the enzymatic status of peroxidase, polyphenol oxidase and non enzymatic antioxidants like ascorbic acid, reducing sugar, phenols and proteins were reported to be more in comparison to mature leaves. The antioxidant property of the herbs fortified turmeric lime lemon treated tomato puree samples were carried out by DPPH assay and the result shown that the total antioxidant potential (TAP) was high than the turmeric lime lemon juice treated tomato puree samples.
Therefore, by using turmeric lime in blanching water of tomato to prepare tomato puree samples, the colour, textural property of the puree can be enhanced and as well as the addition of lemon juice in the treated tomato puree samples help to improve the keeping quality, taste without any alteration in nutritional composition. Along with the development of the sensory characteristics of the tomato puree samples, beet root puree and culinary herbs are used to increase antioxidant property of the developed tomato puree samples, which may include the variety also.