CHAPTER 5

SUMMARY AND PROSPECTS
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The addition of fruit pulp into the milk for yoghurt preparation promotes the fermentative proteolysis. The final product of proteolysis, amino acids, are released more than consumed for the growth of fermenting organisms. Hence, until the proteolysis stops for want of substrate proteins, the total free amino acid content of fermentative media will go up. But, the concentration of the individual amino acids throughout the fermentative process does not have a pattern which matches with the total amount of the different amino acid sampled at comparable stages (hours) of fermentation. The addition of the fruit pulp to the fermenting milk enhances the velocity of proteolysis with all other conditions being identical. This phenomenon is assumed to be due to the enhanced and differential growth pattern of fermentative (mixed) flora.

The higher amount of total free amino acids in fruit yoghurts might be due to the higher proteolytic activity in such yoghurts. Estimation of proteolytic activity of different fruit yoghurts fits exactly to the pattern of the amount of their total free amino acids. It shows that the increase in the total free amino acids in fruit yoghurts is due to increase in proteolytic activity only and not due to decrease in consumption of free amino acids for growth alone.

Addition of fruit pulp to the milk for fermentation draws some proteins out of solution (whey). This has been demonstrated by the SDS-PAGE of zero hour fermentation of plain and fruit yoghurts. However, it does not affect the periodic release of free amino acids and peptides by enzymatic hydrolysis of proteins as
one of the processes of fermentation. It is evident from the fact that the amount of total free amino acids and the proteolytic activity are higher in fruit yoghurts than the plain yoghurt during the various stages of fermentation studied.

It is also found (from SDS-PAGE analysis of dissolved proteins and peptides) that the absence of large peptides in fruit yoghurts could be due to cleaving of their proteins and large peptides into much smaller ones which are not tracked down by SDS-PAGE, i.e. < 5000Da.

The RP-HPLC chromatograms of small whey peptides convincingly demonstrate that totally new peptides are generated by yoghurt formation of milk with fruit pulps. All such peptides formed are extra cellular, hence formed from the milk proteins (small amounts from fruit pulps also possible), consequent to proteolytic activity during yoghurt formation. It is also to be noted that the new peptides generated by the proteolytic activity of fruit yoghurts could be assigned only to the predominance of different enzyme systems of fruit yoghurts. It cannot be assigned to the velocity of proteolytic process common to both plain and fruit yoghurts (otherwise, being the fermentation indices like rate of proteolysis, pH, total free amino acids, etc., same, there should not be any difference in the character of peptides generated as deduced from RP-HPLC of whey peptides).

In the present study, it was observed that the milk initially fortified with fruit pulps and then kept for fermentation by lactic (dahi) cultures showed higher anti-bacterial property than the fermented milk alone. Addition of fruit pulps may have induced the generation of anti-bacterial peptides by promoting different proteolytic systems in fruit yoghurts by altering the growth pattern of mixed microbial culture of yoghurt fermentation.

The organoleptic evaluation of the plain and fruit yoghurts showed that the jackfruit yoghurt was adjudged as "excellent". The banana yoghurt was given
status “excellent”, but only 2nd to jack fruit yoghurt. The pineapple yoghurt got the “good” status and 4th place only, whereas, the plain yoghurt was “good” with 3rd place. Jackfruit is a plentiful, seasonal, non cared, and mostly wasted tree crop of Kerala as well as many other parts of India. If this seasonal bounty of nature could be utilised to manufacture value added product (fruit yoghurt), it may create some employment opportunity among the rural people and also the fruit yoghurt being a healthier food, is to be encouraged among children habituated to ice creams, lactose intolerance and convalescence.