INTRODUCTION

Food processing procedures have advanced with the progress of civilisation. Modern man consumes a larger proportion of processed foods than raw, natural foods. Processing of foods is accompanied by changes in the biochemical composition, digestibility and nutritional status of foods. Foods with inadequate content of essential nutrients and contaminated foods are major threats to human health.

Water, carbohydrates, lipids, proteins, minerals and vitamins have been recognised as essential components of an ideal diet. Recent research has established the essential and indispensable role of another factor - dietary fibre - in animal nutrition. Dietary fibre, which resists digestion by the digestive enzymes of the alimentary canal comprises a heterogeneous group of biopolymers including cellulose, pentosans, pectin, lignin, gums, mucilages, etc. These biopolymers provide bulk to foods and roughage to feces.

Deficient consumption of dietary fibre has been implicated in the pathogenesis or progression of several disorders including atherosclerosis, bowel disorders, colon cancer, diabetes mellitus, evacuation disorders, fat
deposition in obesity, gall-stone formation, hypercholesterolemia and irritable bowel syndrome. A fibre-rich diet is being advised during the treatment of these disorders. Since only very limited information is available on the actual distribution of dietary fibre in various Indian foods and dietary mixtures, a detailed survey was conducted to estimate the fibre-content of different food materials. The role of dietary fibre in the metabolism of cholesterol and the detoxification of heavy metals was also investigated. Several novel, efficient sources of dietary fibre were identified and the kinetics of the interaction of fibre with bile acids and with mercury studied in detail. The biochemical implications of the results are discussed in the thesis. The major objectives of the present study are:

1) to make a preliminary study of the non-enzymatic browning reactions accompanying heat-treatment of foods.

2) to determine the content of actual dietary fibre in various Indian foods.

3) to identify novel and rich, natural sources of dietary fibre.
4) to study the changes in fibre-content accompanying natural maturation of vegetables and different food-processing procedures.

5) to study the kinetics of in vitro binding of bile acids on dietary fibre isolated from a vegetable source.

6) to standardise the procedure for the isolation of chitin, a novel dietary fibre from animal sources and the preparation of chitosan by the deacetylation of chitin.

7) to study the kinetics of in vitro binding of bile acids to chitosan, the digestion-product of chitin.

8) to determine the distribution and concentration of mercury as a contaminant in various food materials.

9) to assess the effects of food processing procedures on the mercury content of foods.

10) to study the role of dietary fibre in detoxification.