

Chapter Six evaluates confectionery extrusion. The introduction describes traditional confectionery processes as mostly consisting of essentially batch operations of long duration, based on the automation of hand work operations. A processing section then outlines the operations likely to be encountered in confectionery extrusion. The problems of flavouring extruded confectionery products are discussed. The advantages of using specific glucose syrups, gelling agents and starches in extrusion cooking are also considered. It is considered that extrusion cooking should replace traditional processes where there are clear economic, hygienic or technologic advantages. The main area of extrusion application in the confectionery industry is expected to be in the development of novel products.

The final chapter of the book discusses extrusion of brewers' hops. A brief outline of the brewing process is given. An extruder can be used as a reactor to facilitate the transformation of bittering precursors to bittering components and this process is described in full. It is thought that the extrusion process could add considerable value to the hop material, however the commercial viability of the process has still to be evaluated.

Each chapter of this book is self-contained, with few references to other parts of the book. However, there is only a small amount of overlap and this is particularly true in the area of raw materials and ancillary process equipment. The typeface and figure style is consistent throughout. All figures are very clear. The book includes a three page index which appears to be comprehensive.

This book is essential reading for everyone concerned with extrusion cooking and product and process development in the food industry. It is an extremely useful handbook on the application of extrusion to many areas of the food industry. It is concerned with up to date applications and will inspire further developments in the area.

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Principles of Enzymology for the Food Sciences. By John R. Whitaker (2nd Edn). Dekker. 1993. ISBN 0-8247-9148-7. 64 pp. Price: \$185.

This second edition of John Whitakers book provides an excellent and authoritative blend of general enzymology, with detailed discussions of selected groups of enzymes which are of relevance to the food scientist.

After introductory chapters covering the protein nature of enzymes and enzyme purification, the book covers active sites, rates of reactions and the effects of specific parameters on enzymic reaction, such as substrate and enzyme concentration, pH, temperature, cofactors and inhibitors. It is these chapters which set this text apart from the many others on offer, as they provide a particularly lucid and readable account of enzyme kinetics without sacrificing depth of coverage. The author has a talent for including the most pertinent information and there is much in this section that will be of value to all students of enzymology.

The remaining chapters cover a selection of groups of enzymes of relevance to the food scientist, such as the hydrolases (glycosidases, pectic enzymes, esterases, nucleases and proteases) and the oxidoreductases (lactate dehydrogenase, glucose oxidase, polyphenol oxidase, xanthine oxidase, catalase and peroxidase and lipoxygenase). These sections cover the reactions catalysed, properties of the enzyme, assay methods and inhibition characteristics of the enzyme.

Overall, the book is very well written and illustrated, and is well planned allowing for easy access to information. I would recommend this text to all teachers of enzymology and to any practising food scientist looking for a sound theoretical introduction to enzymes with a food flavour.

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