and baking; Starches, sugars and syrups; Dairy products; Pectic enzymes in juice manufacture; Enzymes associated with savoury flavour enhancement; Wine; Enzymes in brewing; Fish processing.

The book is well written and presented, with a simple but eye-catching blue cover. Most of the chapters have several sections and each chapter is well referenced. I spotted very few typographical errors, although some non-standard abbreviations have crept in (p. 245, hr; p. 347, sec). The book layout and the way in which it covers specific enzymes, followed by a commodity approach inevitably leads to overlap. For example, information covered in the chapter on carbohydrases also appears in the chapters on pectic enzymes in fruit and vegetable juice manufacture, milling and baking, wine-making, and dairying. The same can be said for most of the other enzymes. However, there is little cross-referencing between these different sections or chapters. This is to some extent compensated by a very comprehensive index, which is useful when looking for specific information. For example, searching for information on the use of lactoperoxidase for controlling microbial activity in milk, I found two references, but it was interesting that neither of these were in the dairying secion. I was also interested in low-lactose milks and found descibed on p. 141, a potential novel application, using lactase enzymes in sterilised milks. In fact this is now a commercial reality in the UK, with such products, produced by adding a sterile enzyme to milk after UHT treatment, being available for cats.

There were a few minor omissions. I found hardly any information on the use of enzymes in combination with membranes in continuous enzyme reactors, for hydrolysis of carbohydrates or proteins, although there was a very brief mention of such reactors in the lipase section. I was also surprised to see no mention of heat resistant lipases and proteases in the dairy section; the latter, in particular can cause problems during storage of UHT products.

I enjoyed reading and reviewing this book and am sure that it will become a much-consulted reference work on all aspects of enzymes in foods.

Mike Lewis

Instrumentation and Sensors in the Food Industry. Edited by E. Kress Rogers. Butterworth Heinemann, 1993. xxxi + 780 pp. ISBN 0 7506 1153 7.

This is a very comprehensive book, which covers on-line, at line and remote (laboratory) measurements. It is divided into three main sections, preceeded by an overview which provides a brief review of the subject area, and discussion of the constraints placed by foods and cleaning regimes together with the challenges faced by designers of instrumentation for food quality assurance. The contents are described to give an impression of the breadth of coverage provided.

Part 1 deals with In-line Measurement for the control of food processing operations. There are chapters on: Principles of colour measurement of food; Colour measurement of foods by colour reflectance; Sorting by colour in the food industry; Compositional analysis using Near Infrared Absorption Spectroscopy; Practical aspects of infrared thermometry; Microwave measurements of product variables; Ultrasound propagation in foods and ambient gases: principles and applications; Ultrasonic instrumentation in the food industry

Part 2 deals with Instrumental Techniques in the Quality Control Laboratory. There are chapters on: Rheological measurements; Modern methods in texture measurement; Water activity and its measurement in food; Instrumental methods in the Chemical quality control laboratory; Impedance tests for microbial Assay; Impedance Microbiology in food quality control.

Part 3 deals with New Sensors for Applications in the food Industry. There are only two chapters in this section. The first is entilted 'The marker concept: frying oil monitor and meat freshness sensor'. The second is on Chemosensors, Biosensors and Immunosensors. This is a long chapter which is further subdivided, with references at the end of each subdivision. The emphasis in this section is on new ideas and concepts, with an eye to future developments in food quality assurance procedures.

The Appendices cover a glossary of terms, which is extremely useful. I think this could have been given more prominence, maybe even its own chapter. Units and dimensions, conversions and some physical properties are also covered. The index, which is 66 pages long, is one of the most comprehensive that I have seen in any book. This adds to its value as an extremely useful reference source: one which provides an up-to-date picture of the state of the art, in an area which is subject to many interesting new developments. Most of the chapters discuss methods from the very simple to the highly sophisticated, for example in the chemical analysis, from simple moisture, fat and nitrogen determinations, through to different types of chromatography and mass spectrometry. Unfortunately, I suspect that some of the instruments described, in this and other chapters, would be outside the budgets of many laboratory managers, although this in no way detracts from their value in the text. The only disappointment was the omission of any detailed discussion on temperature measurement, apart from infrared thermometry. This is a fundamental parameter in many aspects of food control and safety. In the preface, it is mentioned that there are a new range of instruments well beyond the measurement of pressure, temperature, level and flow rate; however these four important control parameters were not discussed in any detail and in my opinion would have merited a chapter.

This book will be of immense interest and value to all those engaged in measuring physical, chemical, biochemical and microbial properties of foods and improving the safety and quality of processed foods.

Mike Lewis