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Book Reviews

Brewing

I.S. Hornsey; Royal Society of Chemistry, Cambridge, 1999, x + 231 pages, ISBN 0-85404-568-6, £16-95

Beer production has seen many changes over the centuries, and this volume combines an historical look at the process with some up-to-the-minute developments, covering the various stages of beer production. The overall aim of this seven-chapter volume is to provide an insight into one of the oldest forms of biotechnology on the planet, namely brewing. The opening chapter, entitled '*The Definition of Brewing*', charts the known history of brewing, from its historical origins with the Sumerians in southern Babylonia (c. 4000 BC), to the Egyptians, Romans, and medieval monasteries. The founders of fermentation science are also discussed, e.g. Robert Boyle, Antonj van Leewenhoek and Louis Pasteur, along with the foundation of important brewing institutions such as The Carlsberg Laboratory, The Bacterium Club, The Institute of Brewing, The Brewers' Guild, Brewing Research International, and The Brewers' Society.

The second chapter is devoted to '*Maltin*' and includes discussion of the barley plant, the malting process, the biochemical structure of barley, malting loss, milling and mashing, sweet wort, other cereals used in brewing (e.g. wheat, rice, oats, rye, maize, triticale, and sorghum), coloured malts, an commercial enzymes used in brewing. The third chapter is devoted to '*Hops*', and covers the plant (*Humulus lupulus*), processing, hop products, varieties, constituents, and diseases. Technically, any product flavoured with the hop is referred to as beer, whilst products using other flavourings are defined as ales. The fourth and fifth chapters deal with '*Wort Boiling and Cooling*' and '*Fermentaion*', respectively, the latter covering yeast, nutritional requirements of yeast, and the physiological condition and vitality of yeast. The most widely used yeasts in the brewing industry are members of the fungal genus *Saccharomyces*.

The penultimate chapter, '*Beer — Post-Fermentation*', provides an overview of cask-conditioned beer, brewery-conditioned beer, nitrogenated beer, high-ravity brewing, low alcohol beer, ice beer, wheat beer, gravity and beer strength, bitterness, colour, foam, nitrosamines, and beer flavour. The final chapter covers '*Microbiology in the brewery*', and discusses ATP bioluminescence, the polymerase chain reaction (PCR), bacteria, wild yeasts, and spontaneous fermentations. In conclusion, this is a concise and extremely informative volume written by a practising brewer, which will appeal to individuals within the brewing and food industries, students of food, chemical or biological sciences, and all beer-lovers!

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Enzymes for Carbohydrate Engineering

Kwan-Hwa Park, John F. Robyt, Yang-Do Choi (Eds.); Elsevier Science B.V., Amsterdam, 1996, VII + 215 pages, ISBN 0-444-82408-1 (US$142.00)

The term carbohydrate is used to describe anything from a simple glucose molecule to very complex structures such as polysaccharides. The advancement of biotechnology in recent years has facilitated greater exploitation of carbohydrates for food and non-food applications. Consequently, research on carbohydrate enzymes was well established and documented by researchers from various disciplines.

Enzymes for Carbohydrate Engineering is a compilation of papers presented and discussed in two consecutive agricultural symposia, which were held in Korea in 1994 and 1995. The importance of carbohydrate engineering in agricultural biotechnology has grown, and the proceedings from the twelve presentations given in the agricultural symposia highlight the latest information and research achievements in enzymology in relation to carbohydrates.

Work on amylases isolated from microbial origins and the modification of carbohydrates by these biocatalysts is of great interest to scientists. Tremendous developments in the genetic engineering program have made the study of the overproduction of bacterial amylases possible. This

particular study has been beneficial in developing an economically viable process for producing valuable biomaterials from starch. *Enzymes for Carbohydrate Engineering* also contains information on several other types of carbohydrate enzymes, including cellulases, pectinases and xylanases. It is interesting to note that the subject matter of storage compounds in plants, particularly lipids, was also discussed in the agricultural symposia.

Enzymes for Carbohydrate Engineering manages to provide a link to bridge the gap between the so-called fundamental understanding and applied research on carbohydrate enzymes. The scientists and researchers involved in the agricultural symposia were all from established universities and research institutes with backgrounds of basic chemistry, biochemistry, molecular biology, microbiology and enzymology. This book is particularly useful to anyone working with or interested in carbohydrate enzymes. It is a good reference book for basic and applied researchers in the field of carbohydrate enzymology, applied biochemistry and microbiology, biotechnology, agricultural engineering and other interrelated disciplines.

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Phytochemicals as Bioactive Agents
Wayne R. Bidlack, Stanley T. Omaye, Mark S. Meskin, Debra K.W. Topham (Eds.); Technomic Publishing Co., Inc., Lancaster, 2000, 296 pages, ISBN 1-56676-788-1, (US$99.95)

The whole field of phytochemicals is one that is expanding and some large chemical companies are placing more and more emphasis on the natural plant materials in view of their being renewable. This includes carbohydrates, both monomeric and polymeric. Phytochemicals with bioactivity have been used as pharmaceuticals and pest management aids. The positive correlation between certain diets, specific foods and disease expression has consistently been shown by epidemiological evidence. The health benefits of certain foods are not solely due to their nutrient contents, but due to the presence of phytochemicals, which have displayed bioactivity in the prevention of cancer, heart disease and many other diseases.

Phytochemicals as Bioactive Agents contains the latest in phytochemical research, especially on the antimutagenic and anticarcinogenic effects of tea constituents, chemoprevention from cruciferae and allium, and the effects of garlic on lowering serum cholesterol. The book contains 14 chapters and starts with strategies for the discovery of bioactive phytochemicals and QSAR, and molecular modelling of bioactive phyto-phenolics. Subsequent chapters cover chemoprevention by phytochemical modifiers of carcinogen metabolism, clinical trial design for evaluating phytochemical bioactivity, the use of fermentable fibres to manage the gastrointestinal ecosystem, and phytomicrobial (PAM) agents as multifunctional food additives.

The protective effect of tea on cancer: human evidence, the effect of genistein on growth of human breast cancer cells *in vitro* and *in vivo*, and cancer prevention by carotenoids and curcumin are all covered in later chapters. The book describes the chemistry and applications of alfalfa saponins and saw palmetto, and discusses the effect of garlic on serum cholesterol levels. Finally, the bioactives in rice bran and rice bran oil are covered, and the book concludes with a chapter designing functional foods to enhance health.

Phytochemicals as Bioactive Agents presents the latest research findings and contains contributions from over 53 internationally recognized experts in the field. The book evaluates mechanisms of action and describes compound characteristics and their metabolism in the body. The integrated role of phytochemicals in health and disease prevention is also presented. The book is an ideal reference tool for food researchers, scientists and technologists and educators, food process engineers, biochemists, nutritionists, public health professionals and entrepreneurs involved in the design, processing and marketing of new functional food products.

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