

The Living Gut. By W.N. Ewing and D.J.A. Cole, Context Publications, Dungannon, 1994. viii + 220 pp. Price £39.50. ISBN 1-899043-99-4.

The absorption of nutrients from the diet is the result of a series of complicated processes in the gastro-intestinal tract. In its simplest form it can be considered as the process of hydrolysis and fermentation, with the end products of each being absorbed through the gut wall. The form of the gastro-intestinal tract will determine the nature of its digestion, the main sites of microbial fermentation differing from species to species.

This volume seeks to present a detailed introduction to the identity, location and activity of the gastro-intestinal microflora, particularly bacteria, and is composed of nine chapters and an exhaustive set of scientific references. Techniques for the manipulation of gut function and consequent effects on the health and performance of the animal are also considered.

While the species which make up the flora and fauna of the gastro-intestinal tract are numerous, bacteria play a key role. Consequently, it is relevant to give particular consideration to the form and function of the bacterial cell. Bacterial cells occur in a variety of shapes and sizes depending on the type of organism and on the way in which they have been grown. They are smaller than animal cells and are more susceptible to osmotic and environmental changes. Different bacteria attach preferentially in different organs. Consequently, cell recognition is important to bacteria. It is suggested that carbohydrates (specifically oligosaccharides) are the primary markers for cell recognition with all cells carrying a sugar coat.

Manipulation of the diet has long been of interest in order to benefit the health and well-being of the animal concerned. In both man and animals the health of the digestive tract is of importance. The composition of the diet, in terms of its nutritional value, can influence the working of the digestive system. Various forms of enteritis and diarrhoea are common in man and animals. In this book two particular organisms, *E. coli* and *Salmonella*, have been chosen for detailed consideration because of their widespread involvement in problems in the digestive tract.

The overall presentation quality of this book is high, the diagrams being particularly well laid out. The appendix provides useful information in the form of a geographical index of culture collections throughout the world, and the bibliography is extremely comprehensive with over thirty pages of references. This is undoubtedly an invaluable book for animal scientists, producers and veterinarians alike, as well as biologists and biochemists, and is thus highly recommended.

**John F. Kennedy
Charles J. Knill**

The Alcohol Textbook. Edited by T.P. Lyons, D.R. Kelsall and J.E. Murtagh, Nottingham University Press, Nottingham, 1995. vii + 332 pp. Price £40.00. ISBN 1-897676-557.

The production of alcohol has been acknowledged since the earliest recorded history. The modern sciences of microbiology, enzymology, chemistry and biochemistry have added depth to the empirical knowledge of distillers in the previous millennia. Many people still confuse the production of alcohol with a purely chemical process in which starting material A reacts with reagent B to yield product C. This is most definitely not the nature of alcohol production, where complex microbiological and biochemical processes, along with the application of chemical engineering principles, have inter-related roles in the overall outcome of the process.

Processes for making alcohol are broadly divided into four steps; (1) feedstock preparation, (2) simple sugar fermentation, (3) alcohol recovery, and often (4) non-alcohol residue recovery. The feedstock may already contain the free sugars, as in the case of molasses, sugar cane juice or whey; or may contain sugar based polymers such as cellulose, hemicellulose or starch, which can be depolymerised to yield fermentable sugars on hydrolysis.

This textbook has been produced to fill a void in the scientific literature available for distillers, and is based on an annual course held in Kentucky for distillery managers and chemists which is directed towards the fermentation and distillation of ethanol for all sectors concerned with this product, including fuel, beverage and industrial alcohol.

The first few chapters discuss the use of a variety of carbohydrate based feedstocks, such as molasses, whey and cellulosics. Whey is the by product of cheese production, and is the liquid left when the milk protein and fat have been coagulated by enzymes and removed to make cheese. Production of ethanol from cellulosic feedstocks is of growing interest world-wide. Potential utilisation of large volumes of primary and secondary cellulosic wastes to produce fuel and chemical feedstocks presents significant technical and economical challenges.

A number of subsequent chapters are devoted to the production of specific alcoholic beverages, such as Scotch and Irish whiskies, American whisky, Canadian rye whisky, rum, and neutral spirits. Such chapters also include information on production set-ups, still designs, boilers, cooling, etc. Individual chapters on fermentation, distillation, the role of enzymes, and alcohol biochemistry are also presented and provide a wealth of interesting and important information.

A significant feature of the book is the incorporation of the 'Alcohol Alphabet', a comprehensive glossary of