



Book Reviews

Alternative Sweeteners. Edited by Lyn O'Brien Nabors and Robert C. Gelardi. 2nd Edn. Marcel Dekker Inc., New York, 1991. viii + 461 pp. ISBN 0-8247-8475-8. Price: US\$143.75.

This second edition of 'Alternative Sweeteners' is revised and expanded (first edn. 355 pp). Some new sweeteners are included and thaumatin (a protein sweetener) has been deleted because its persistency has precluded its use as a sweetener.

The book is clearly divided into three sections: intense sweeteners, caloric sweeteners and multiple ingredient approach. Presentation is attractive and the editors must be congratulated on the technical accuracy and absence of textual errors, which makes the book a pleasure to own as a reference text.

One or two points about the contents are somewhat puzzling. For example, the inclusion of *L*-sugars within the intense sweetener section, when their sweetness potency is somewhat less than sucrose, is anomalous. Also the section on fat alternatives departs altogether from sweeteners, but these are important in low calorie foods. Information was generally well provided and helpful for applications of sweeteners, throughout the book, but inevitably there are also some annoying gaps. For example, the Table 1 on p. 175 for the temporal sweetness characteristics of sucralose (one of the newest sweeteners) does not indicate what strength of sucralose solution was used, nor indeed its temperature. It is also important not to confuse the terms 'taste' and 'flavour'.

The caloric sweetener section (which would more aptly have been designated 'bulk sweetener' and included the *L*-sugars) was extremely well researched and well presented. I especially liked Moskowitz's chapter on maltitol and hydrogenated starch hydrolysate, which was accurate, concise and technically informative. Although the polyols are now well-established sweeteners their taste quality and functional effects are close to those of the common food sugars and they therefore have particularly good prospects as food ingredients.

It could be argued that this book covers the same ground as 'Handbook of Sweeteners' by Marie and Piggot (Blackie, 1991). However, I find that 'Alternative Sweeteners' is the better of the two from a chemical point of view. It is up-to-date, structurally accurate and technically dependable, and I recommend it to all

scientists and technologists interested in the use of sweeteners in foods.

Gordon Birch

Lithium in Biology and Medicine. Edited by G. N. Schrauzer and K-F. Klippel. VCH, Weinheim, 1991. xiii + 209 pp. ISBN 3-527-28203-3. Price: £36.50.

It is well known that the trace element lithium, usually in the form of lithium carbonate, has for over thirty years been used in clinical practice for the treatment of various mental disorders including manic depressive psychosis. Indeed, lithium has been claimed to be the most effective anti-psychosis agent known. It has even been shown to calm habitually violent prison inmates without producing any adverse side effects on intelligence or personality. However, a body of evidence has been accumulating during recent years that lithium may have other valuable uses in medicine, and may even be an essential trace element micronutrient.

The present book is made up of the papers at an International Symposium at Trier, Germany in 1990. The area covered is surprisingly wide, bearing in mind the novelty of most of the subject matter. Thus the first paper by Joyce reviews previous reports that lithium enhances the recovery of hematopoiesis that had been damaged by cytotoxic chemotherapy, and describes the protective effect of lithium on mice that had been subjected to normally lethal radiation levels. In a related paper, Gallicchio *et al.* report that lithium enhanced the hematopoietic recovery of irradiated bone marrow. These findings and others in the paper by Kehrberg indicate that lithium has a useful role to play in protecting the blood-forming systems against the damage normally caused by aggressive radiation and chemotherapy for the treatment of cancer.

In another paper, Vanyo *et al.* show that lithium can increase cellular uptake of vitamin B₁₂ and may modulate cell growth. Horrobin reviews the effects of lithium on fatty acid metabolism, and describes how a serendipitous observation led to the discovery that topical application of an ointment containing lithium succinate proved effective in treating seborrhoeic dermatitis. Controlled clinical trials have confirmed this finding. Visca, Santi, and Spina provide and review evidence that lithium may have clinically useful properties as an immunomodulator.

Other papers deal with effects of excessive lithium intake, the question whether lithium can safely be given during pregnancy, and biological interactions between lithium and other metal cations. Studies with goats described by Anke *et al.* show that kids of lithium-deficient goats had lower birthweight than those of control goats, and that lithium deficiency led to decreased conception rate and a significantly increased abortion rate. Lithium-deficient goats produced less milk, though milk quality was unaffected, and it significantly decreased the life expectancy of the animals. The same workers also report that the dietary lithium intake of human adults is very variable, and ranged up to about 0.5 mg per day in E. Germany.

The last two papers are perhaps the most interesting. Both papers describe studies in Texas, and both groups have independently reached the remarkable conclusion that there are statistically significant *inverse* correlations between the lithium content of drinking water and murder rates. Dawson reports a similar correlation with rates of admission to mental hospitals. Schrauzer and Shrestha report similar statistically significant *inverse* correlations with rates of suicide, rape, robbery, and heroin abuse, *inter alia*. Dawson concludes that 'it would seem that the populace of any community should derive a prophylactic benefit (from lithium) with respect to the four major forms of mental illness and to homicidal aggression'. Schrauzer and Shrestha go so far as to suggest that lithium supplementation or the lithiation of drinking water may provide 'a possible means of crime, suicide, and drug dependency reduction at the individual and community level'.

Unfortunately, traditional attitudes to anti-social behaviour are based on the supposition that man is primarily a social animal; whereas the truth is that man is both a social and biological animal. There is now a growing body of evidence, of which the book under review is an important part, that neglect of this important biological component of the human condition is a major reason for the well-documented failure to correct violent and other anti-social propensities by incarceration and other sociologically-based procedures. The work described in these last two papers adds to the growing evidence that we need to develop scientifically based approaches to the widespread problem of disturbed and anti-social behaviour. And the book as a whole provides strong grounds for regarding lithium as a micronutrient trace element that is probably essential.

In short, this is an important book which should be in every university and hospital library. University libraries might consider purchasing two copies, one for the biochemistry/nutrition section, and another for the sociology shelves.

D. Bryce-Smith

Determination of Veterinary Residues in Food (Ellis Horwood Series in Food Science and Technology). By Neil T. Crosby. Van Nostrand Reinhold International. Chapman & Hall, 1991. 233 pp. ISBN 0-7476-0065-1. Price: £39.95.

Residues of potentially harmful compounds are of veterinary importance in more than one way. First, substances may be added to, or accidentally get into, general animal feeds (e.g. medicinal additives, heavy metals, pesticides). Secondly, various substances may be injected or fed for specific purposes periodically during the animal's life (e.g. anthelmintics, antibiotics, coccidiostats). Thirdly, some animals are bred and grown for slaughter, and in these cases any residues, whether accidentally acquired by the animal or whether administered deliberately to promote health or growth, are to be regarded as contaminants when the animal tissue or products become human food. Dr Crosby's book covers succinctly the wide range of materials of importance to food scientists, veterinary scientists and to workers in the animal feed trade. If the reviewer has a criticism, it is that the author slides with a rather too delicate a *glissando* between feed analysis, tissue analysis and the analysis of human foods; these things are indeed related, and the methodologies are similar, but some readers could find the approach a little confusing.

The first of eight chapters deals with composition of animal feeding stuffs and additives. Chapter 2 describes the general principles of the main analytical methods of extraction, cleanup, gas-liquid chromatography (GLC), high pressure liquid chromatography (HPLC), mass spectrometry and immunoassays; the account is clear but simple, and would perhaps have benefited by provision of a few specific examples of substances analysed by each method, with cross-references.

Chapters 3, 4 and 5 deal respectively with anthelmintics, antibiotics and coccidiostats. The range of compounds of each type is listed and much space is given to structure; indeed, in some cases the proportion of space devoted to the analytical determinations themselves is rather low and sometimes undeveloped; for example, on page 111, where HPLC is being discussed for the detection of antibiotics, numerous methods in the literature are quoted, but no guidance is given as to what the author himself has used or would recommend. This criticism applies elsewhere also. The analyses quoted are predominantly of body tissues in the case of the anthelmintics whereas the antibiotic determinations quoted were mostly on animal feeds, in animal tissues and in milk. The coccidiostat analyses were predominantly done in relation to feeds.

Chapter 6 describes the use of antimicrobial agents and hormones as growth promoters, including the past and present legal position. Various HPLC and TLC methods have been developed for many of the anti-