

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.

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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-

microbial compounds but immunoassay techniques are commonly used for hormones. Analyses for the latter remain important despite a total EC ban on the use of hormones for growth promotion, because hormonal implants can improve farmers margins by L30 for steers and L15 head for heifers.

Chapter 7 considers other contaminants. The pesticide section is almost entirely based on pesticide content of human food, so the veterinary impact relates mostly to presence of pesticide residues in meat and dairy products. Heavy metals, on the other hand, are considered in relation both to animal feeds and their

entry into human food in consequence of their presence in animal products. Chapter 8 is devoted exclusively to legislation.

Neil Crosby is Head of Fertilizers and Feeding Stuffs, Laboratory of the Government Chemist, Teddington, England. All in all, I think that the author should have been less modest about his own analytical methods, rather than quoting the literature in a rather neutral way. At £39.95, hard back, for 233 pages, some may regard the book as expensive.

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