

### BOOK REVIEW

*The Nutrition of Herbivores*—J. B. Hacker and J. H. Ternouth (Editors). Academic Press Australia, Sydney, 1987, 552 pp. A\$50 plus \$6 surface postage.

This is a very interesting book. It is a compilation of invited reviews presented to the Second International Symposium on the Nutrition of Herbivores, held in Brisbane in July 1987. Most of the reviews are very broad in their discussion, and make a strong case for the argument that those of us in this field have much knowledge to share and lessons to learn from people working with widely different herbivore species. Those among us who in our routine reading skim over the publications on sheep because we are working with cattle, or vice versa, would greatly benefit from reading this book, then analysing our present methods of gathering scientific information.

This is not to say the book is packed with interesting ideas. Its strength lies not in the specific detail it presents, but in the contrast among the reviews in species studied, experimental techniques, digestive physiology, diet selection and other matters. Most authors appear to have been conscious of this point. I. D. Hume and C. Devendra set the scene by reviewing the herbivore species of importance, including an interesting explanation of digestion in marsupials by the former author and a sound discussion of the relative adaption of various species to arid and humid tropical areas by Dr. Devendra. These adapted animals can only thrive if we maintain the productivity of pasture lands and the subject lends itself well to Dr. B. R. Roberts arguments that we should protect the stability of land. He also argues for population control in humans, thus further broadening the scope of the review. It was a great challenge to ask authors to discuss pasture quality and secondary compounds in forage in these broad terms, and Jones, Wilson, Barry and Blaney have done well to make these two chapters interesting. Many of the points depend on specific information, for example parameters of pasture quality or toxic agents in lupins, and the authors have shown much common sense in limiting the detail put forward in order to concentrate on major points. A striking point is the large variation existing in these parameters in herbage species and cultivars, encouraging the belief that plant breeding can assist in improved quality and removing toxins. I found the chapter on secondary compounds very interesting, perhaps because it is an area in which I had little personal knowledge.

The chapter on diet selection by Malachek and Balph typifies the challenging nature of the book. Here we have a discussion on the psychological aspects of diet selection and the associated ecological effects, and a suggestion that we go back to the fundamentals of diet selection to begin formulating management policy. The understanding of behavioural responses, as against genetic influences, on diet selection may lead to practical benefits in domestic as well as wild herbivores. Genetic variation among species was a point raised also by Janssens and Ternouth in discussing the change from milk to forage diets in various species.

A number of chapters follow on nutrition and environmental adaptation. Weston and Poppi demonstrate the distinction between regulation of intake at a meal and long term feed intake, and discuss each of these. The thermal environment (Young), endo (Sykes) and ectoparasites (Sutherst) and mineral elements (Suttle) in the diet are shown to have major influences by altering changing food intake as a major way animals adapt to seasonal food intake. Mackie makes a convincing argument that it may be possible to manipulate rumen micro-organisms in order to make substantial gains in utilization of forages. There is clearly much to understand yet in this area, and this would appear a prerequisite to using recombinant DNA techniques to alter rumen microflora. The technique of maintaining adult ruminants by infusion of nutrients directly into the abomasum (Orskov and Kay) has provided some interesting data on aspects of digestion such as biological value of bacterial protein, nitrogen secretion into the gut and the utilization of various mixtures of volatile fatty acids.

The partitioning of absorbed nutrients is very much under hormonal control and Thornton shows that a number of these hormonal influences can now be manipulated.

The impression is gained that there are large developments in this area which may soon find practical application.

Supplementary feeding of forages (Elliott and McMeniman) and other supplements (Doyle) is heavily dependent on economic factors, and this point came through in both these reviews. There are clearly many byproduct forages which could be more efficiently utilized for animal production, and often efficiency is improved when mineral or nitrogen supplements are given with forages.

A key chapter is entitled "Assessing the nutrient status of herbivores". However I felt Dr. Langlands had difficulties here, for although he has been able to outline many tests carried out in research establishments and diagnostic laboratories, there is not a convincing argument that practical diagnosis in commercial enterprises is well established.

The final chapter of the book is the D. O. Butler Memorial Lecture, presented by Dr. St. C. Taylor during the conference. It is a deep review of genetic aspects of survival and growth in relation to body size, and is done in the usual thorough fashion of Dr. Taylor's publications. He is able to integrate nutrition and genetics in discussing growth and development and draw generalities among species, levels of nutrition and other factors which are a useful framework to thinking. Any further comment by me is unlikely to be useful, better that it be read as a whole.

The book is well presented and carefully edited. I found very few errors. One annoying point was the quality of the cover, it sticks to other books and tables and therefore requires covering with something such as "Contact".

In conclusion I feel the book is essential reading to those research and extension people wanting to broaden their appreciation of the subjects covered. It is not a book that would be easily quoted in specific publications, rather a book which gives us a challenge and a broader framework for thinking in the future.

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*Herbivore Nutrition Research*—Mary Rose (Editor). A.S.A.P., 1987, 236 pp. A\$10 plus \$2.50 surface postage.

This is a companion to "The Nutrition of Herbivores". It contains 118 summaries of specific research projects being done on one or more of the fields reviewed in the plenary papers presented to the conference. The summaries cover a wide range of subjects within the theme of the conference, supporting the broad perspective and providing specific data on work in progress.

Headings for the summaries are herbage production, nutritive value of herbage, forage treatment, secondary compounds, the gastro-intestinal tract and motility, selective grazing, intake and selection, microbial metabolism, digestion and metabolism, intermediate metabolism, herbage utilization, energy and protein supplements, minerals and mineral supplementation and nutrition of herbivores. In each of these areas there are interesting comparisons of work being done in domesticated species such as cattle, buffalo and sheep, with that being done with non domesticated species such as reindeer and kangaroos. The sections on selective grazing and supplementation are particularly interesting in this way.

The book is well prepared and easy to use in referring to a number of summaries quickly. I can't judge if it is a comprehensive summary of work in progress as there are many fields covered, but it is a good demonstration of a wide cross section of work with various species, all directed at better understanding the nutrition of herbivores.

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