

integrating different pasture types and different land classes on a whole farm basis.

There is a further serious omission in the section on the diagnosis of mineral deficiencies and toxicities (p.94). There is no mention of nutritional screening procedures, developed by the late C. S. Andrew, involving the use of nutritionally sensitive legumes as indicator plants. These procedures have been the key to successful development of grass/legume pastures on marginal lands in the high rainfall tropics of Australia, Malaysia and the Philippines.

Despite these limitations, the book is an admirable introduction to tropical pasture science for diploma and first year university students.

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Dairy Cattle Research Techniques. By J. H. TERNOUTH (Ed.) Queensland Department of Primary Industries, Brisbane. (1983), pp 366. \$28 hard cover, \$20 soft cover.

This review of techniques is a welcome contribution to the many problems associated with research on the dairy cow. The coverage of subjects in the present volume is almost encyclopaedic. A number of Australian specialists have contributed referred chapters on philosophy, methodology, husbandry, nutritional and physiological aspects of cattle experimentation.

Classical experimental methods are dealt with in an introductory chapter followed by discussions of planning and management of trials on dairy cattle. The main thrust of the book is its comprehensive presentation of husbandry techniques relevant to experimentation on calves, young cattle, and cows. A critically important chapter is that on grazing research. Substantial discussions follow on research into genetic improvement and in male and female reproduction. Thereafter milking research and milk hygiene are summarized: also an important chapter is devoted to sampling methods for milk, body fluids, tissues, infections and parasites. The issues here are important in their own right but also in their contribution to the growing awareness of the interactions of husbandry, nutrition, and health in research.

The philosophy of experimentation is taken up again with chapters on research objectives with emphasis on operational research, scientific literature, survey procedures, and the reporting of research findings. Two points regarding presentation formats and content are that these chapters could perhaps have been put with the earlier similar papers; also a chapter could have been included to discuss general problems of research; costs, labour demand, necessary deviations from optimal practice and hence reduced output from some stock in order to establish that optimal actual coefficients of variation, the merits of demonstration units, possibly also a brief comment on modelling. Comments on many of these points appear variously in the text but consolidation would be advantageous. Useful appendices are included on body scoring, nutrient requirements, and composition of feeds.

Careful editing has resulted in a clear, very readable book free from typographical errors. The book is pleasant to handle and will withstand a lot of usage.

The aim, to present cattle research techniques relevant to Australia, has been achieved but indeed has also been surpassed in a publication containing much of world wide research interest, application to species other than cattle, and benefit to good husbandry. The book's long term relevance will be fostered by the firm avoidance of discussion of today's research interests. It is essential reading for the post graduate specializing in dairy cattle research; for those already engaged in this topic it is a comprehensive refresher and reference book; and for field officers, lecturers, veterinarians, statisticians it is valuable collateral reading.

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