

Genetic resistance to animal diseases

M Müller and G Brem (coordinators)

1998. *Office International des Épizooties, Revue Scientifique et Technique* 17 (1), 392 pp., soft cover. Price: FrF 270, US\$ 45 (including airmail postage). ISBN 92.9044 466 5.

This special issue of the *Scientific and Technical Review* of the OIE (*Office International des Épizooties* – the world organisation for animal health) provides a compendium of 27 papers on a subject of growing importance for the worldwide future of livestock health and production, more especially in Africa. Its major appeal will lie primarily in the rare quality of many of the papers and the balance it strikes in presenting the scientific basis of disease resistance and the methods – from conventional breeding to gene transfer – that can be employed to achieve it. A minor deficiency is the lack, as far as one can judge, of a single African among the 59 contributors and the passing lip-service it pays to mammalian diversity in Africa. That diversity contains much of the genetic potential for addressing a whole range of infectious disease problems in Africa and elsewhere.

Genetic resistance to animal disease, *i.e.* the heritable diversity in the susceptibility of species, breeds and individuals, has been recognised for a long time, but has only been fitfully exploited. Perhaps the best local examples were the pioneering observations of J.C. Bonsma on differences between breeds of cattle to tick infestation and heartwater and the subsequent development of the Bonsmara breed. Genetic variability in the resistance of poultry breeds to Marek's disease and avian leukosis has also long been appreciated. A more recent example from Australia, described in this volume, is aimed at the problems of gastrointestinal nematode infestations, flystrike (cutaneous myiasis) and footrot in Merino sheep (Raadsma, Gray and Woolaston). Other than these, however, practical success stories, as opposed to interesting scientific phenomena, are hard to find.

Therein lies this volume's probable value, *i.e.* in successfully making the major issues with respect to disease resistance available to a wide audience concerned with the control of animal disease. It adequately demonstrates the paucity of progress made because of the complexity of the subject but, at the same time, points out the future potential. The realisation of this potential is arguably more important for Africa than it is for other

regions of the world because financial, logistical and political realities are making the conventional control of animal diseases in Africa increasingly difficult and sometimes impossible to implement. Genetic resistance to disease may help to ameliorate these constraints in some circumstances.

From a personal perspective the chapters on the biological principles of heredity and resistance to disease (Horin) and genomic approaches to the improvement of disease resistance in farm animals (Soller and Andersson) were particularly useful. It could be argued from the same perspective that there are too many papers dealing with conventional immunological topics such as non-specific immunity, immunoglobulin diversity, T-cell receptors, cytokines and major histocompatibility complexes because this information is available from other sources. On the other hand, there has been a clear effort in the selection of these papers to concentrate on farm animals rather than using mouse and human models or examples that one finds regularly in texts purporting to address animal diseases. These chapters are therefore likely to be a ready source of summarised information for non-specialists.

The papers are divided into 9 groups, *viz.* mechanisms of defence against infectious diseases; genetic resistance to parasites; bacteria; viruses; prions; conventional breeding programmes; marker-assisted selection and identification of disease traits; study of genetic resistance by targeted disruption of gene function; and genetic resistance through gene transfer. Some groups, however, contain only one paper. The papers have obviously been carefully edited because few editorial errors were encountered and the papers themselves are clear and easy to read.

For anyone interested in disease resistance in farm animals this volume contains a fund of useful and interesting information as well as valuable references.

G R Thomson

ARC - Onderstepoort Institute for Exotic Diseases