

Economic impact of endemic livestock diseases

Johann Schröder
Meat and Livestock Australia
Level 1, 40 Mount Street, North Sydney NSW 2060

Introduction

Rural R&D Corporations (RDCs) constitute an important funding vehicle in agriculture in Australia, leveraging invested producer levies with commonwealth co-funding contributions. Diseases of cattle, goats and sheep represent an impost to profitable production of red meat and other commodities. One method of prioritising investment in research into possible ways of mitigating this loss, is to consider and rank the estimated cost of endemic diseases. An estimate of the cost of endemic diseases of cattle and sheep was co-funded by Australian Wool Innovation and MLA, and published in 2006¹. It was considered necessary to repeat that survey and to address some of its perceived shortcomings. These included the lack of goat information, the exclusion of subclinical conditions only diagnosed at slaughter, such as Sheep Measles, the subsequent emergence of *Theileria orientalis* infection in cattle as a significant cause of disease, and the fact that it was now more than 6 years old. It had also become clear in the interim that knowledge deficit and clear articulation of the researchable question are factors additional to the cost when deciding to invest in research into a particular disease or condition. Specific local imperatives constitute an additional consideration.

Scoping the survey

At the time of planning the new survey, there appeared to be a number of activities at various stages of completion, investigating the occurrence of a variety of livestock conditions, and reported in different repositories. In order to define the scope of a single comprehensive survey, a workshop was held in April 2013. Attendees represented academia, state jurisdictions, and peak industry councils. They brought expertise in animal health, epidemiology and agricultural economics to the table, and discussed the methodology (survey method, disease list, data analysis and economic modelling). The upshot was a recommendation that the survey be conducted in 4 phases:

- a. determining a priority list of diseases to consider by questioning producers, meat processors and veterinarians, and interrogating available published and “grey” literature,
- b. review the priority disease list to identify knowledge gaps and define researchable questions,
- c. for poorly understood diseases, determine patterns, distribution, prevalence and epidemiology by collecting data on-farm and in abattoirs, and
- d. economic analysis, using whole-farm models².

The survey

Terms of reference were published in line with the scoping study’s recommendations, but excluding the on-farm and abattoir data collection. Expressions of interest were invited, and a research team selected by the end of January 2014. Their report was published in March 2015.

The survey report lists 17 cattle, 23 sheep and 8 goat conditions, with an estimated combined annual cost of \$2.7Bn. Ovine Johne’s Disease and Bovine Viral Diarrhoea (BVD) had notably gained significance (compared to 2006), whereas *Phalaris* toxicity had dropped off the list for sheep. In addition to the goat conditions, the newcomers

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included 4 cattle and 13 sheep conditions (of which 5 are only diagnosed at slaughter). In the case of sheep, dog bites and grass seed contamination (both seen in abattoirs) were specifically excluded. For cattle, a separate, but roughly concurrent, investigation⁴ estimated the cost of fluoroacetate toxicity to the northern beef industry at ca. \$45M p.a. This condition does not appear in the survey report.

In addition to the estimated cost for each disease, the consultants provided an assessment of current knowledge pertaining to aetiology, prevention, treatment (representing the knowledge deficit), and geographic distribution and prevalence stability (representing the perceived threat posed by the condition), to help guide future research investment decisions. To further aid appraisal of the survey results, the consultants separated northern and southern beef production systems, to accommodate differences in epidemiology for external and internal parasites, arthropod-borne diseases and infectious diseases such as BVD and Clostridial infections.

Intriguingly, assigning a weight to each disease, determined by a combination of its estimated cost, knowledge deficit and threat, resulted in relatively little change in the top 10 sheep and cattle conditions, with 9 of those based on cost, still featuring in the top 10 determined by the weighting, with small changes in sequence of importance.

It is anticipated that this report will help inform future decisions on priorities for producer levy-funded R&D in Australia.

References

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