IMPLICATIONS OF INFECTIOUS DISEASES FOR BREEDING AND MARKETING SEEDSTOCK

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SUMMARY

Seedstock producers, in the process of distributing livestock have the potential to disseminate diseases. There is increasing concern about the spread of ovine Johne's disease and anthelmintic resistant nematodes. The implications of these issues for sheep seedstock breeders and marketers are discussed.

Keywords: Diseases, seedstock, Johne's disease, resistance.

INTRODUCTION

In the process of breeding and disseminating seedstock, there is considerable potential for the spread of infectious diseases. This has been highlighted in recent years by the concern over ovine Johne's disease and to a lesser extent, anthelmintic resistant worms and footrot.

As woolgrowers' awareness of these risks increases, there is increasing demand from purchases of seedstock for assurances that introductions do not provide unacceptable risks to the purchaser's flock.

OVINE JOHNE'S DISEASE (JD)

Current Situation. JD was first detected in Australia in 1980 (Seamen *et al.* 1981) and has since been detected on approximately 200 farms predominantly in NSW, but also in Victoria and Tasmania (Figure 1). The exact prevalence is not known because of long incubation periods and often mild clinical signs as well as under reporting of infected flocks. The most likely source of the disease was via sheep or goat introductions from New Zealand. Since 1980 the rate of detection of new cases has increased exponentially which is similar to the pattern of spread in New Zealand.

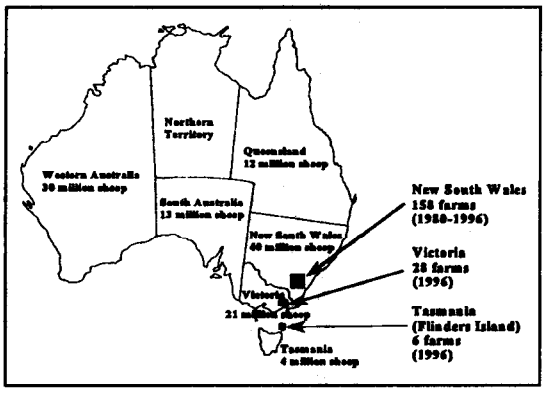

Figure 1. Ovine Johne's Disease in Australia.
(Denholm *et al.* 1997)

Spread has been predominantly by movement of sheep both commercial and seedstock. The extent to which spread has been associated with movement of the infectious agent via faecal material, water courses or other species is not known at this stage, but is probably less important than the movement of infected stock. The seedstock industry has been involved in spread by movement of infected rams to other flocks. The relative importance of this method of spread has not been determined but there are sufficient proven cases for the issue to be a concern in the sheep industry.

The infection in seedstock flocks may have become established from a number of sources:

- Introduction of infected sheep, either seedstock or commercial.
- Introduction from neighbouring flock.
- Introduction via contributed sheep in a group breeding scheme. Group breeding schemes present an increased risk of disease spread because of movement of relatively large numbers of sheep between ram breeder and contributor level (West 1997).

Although Victoria has commenced a program with the aim of eradication, NSW and Tasmania are at this stage aiming to contain spread and determine prevalence. It is not yet known whether there will be a national eradication program, particularly given the low production loss in most infected flocks and the gaps in the knowledge of JD epidemiology.

Implications.

Market Assurance. Seedstock producers will increasingly be requested to provide an assurance regarding the JD status of their flock. This will be particularly important for interstate sheep movements. This can be done by vendor declaration or by the National Market Assurance Program (MAP) which is due to be introduced in March 1997. Due to the large number of sheep to be tested to provide reasonable confidence of disease freedom (approximately 300) and follow up of reactors with histopathology, entering the MAP will be expensive at approximately $2-3,000 per annum. This cost will be able to be borne more easily by larger seedstock producers than those producing and/or selling small numbers of rams.

Group breeding schemes will have a much higher cost because not only the nucleus will require testing, but so will each of the contributor flocks. The cost for a group breeding scheme with 15 contributors is likely to be $30-45,000. Such a cost will result in many group breeding schemes re-evaluating their breeding program and the benefits of contributing ewes versus the cost of entering a MAP.

Unfortunately there will be some producers, which in the process of entering a MAP, will be found to be infected with JD. The net effect will be closure of ram breeding operations. Although for most seedstock producers, the risk of a positive test is low, the consequences are such that some may be reluctant to test. However, if they continue to trade while there is any evidence of JD infection they may be liable for damages under common law.

Artificial Breeding. Artificial insemination and embryo transfer offer access to superior quality stock without the risk of introducing the stock to a property. Although both of these procedures are

believed to be low risk, there is some evidence that mycobacteria may attach to embryos. Therefore it would lower the risk if embryo transfer programs were done with JD free donors and recipient ewes.

Artificial insemination centres are a potential source for JD spread. Although many test sheep on arrival, the test used has had low sensitivity (30%). Therefore it would have been possible for JD infected sheep to have been kept in AI centres. The main risk of transmission would occur when sheep are at pasture rather than shedded. In future a more specific EHSA test will be available but given the lack of knowledge on incubation period and time for seroconversion, AI centres would be prudent to source sheep from JD free flocks rather than rely on testing of individual sheep.

This may limit the number of sheep entering AI centres and possible result in more AI work being done on farm.

RESISTANT WORMS

Current situation. Anthelmintic resistance is a widespread problem in Australia with one survey showing 85% of flocks were infected with resistant worms. (Overend *et al* 1994). The resistance is predominantly to the benzimidale and levamisole groups of drenches although more recently resistance has been reported to the macrocyclic lactone group (ivermectin, moxidectin, doramectin) (Rolfe 1997).

Implications. The seedstock industry has a responsibility to limit the development and spread of resistant nematodes through:

- Use of worm control programs which delay the development of resistance.
- Ensuring sheep which leave their properties other than for slaughter are treated with an effective anthelmintic.

As the prevalence of resistant nematodes continues to increase, there will be widespread concern about suboptimal worm control and the consequent economic loss. As a consequence, there is likely to be increased demand for sheep selected for worm resistance. It is important that these selection programs are realistic in what is achievable both at commercial and stud level and also maintain selection pressure for other important commercial traits.

OVINE BRUCELLOSIS

Current situation. This disease has declined in prevalence, principally due to the development of a highly sensitive and specific blood test as well as a flock accreditation scheme. Most seedstock producers belong to these schemes and breakdowns are rare (I. Links pers. comm.).

Implications. The current implications of ovine brucellosis are minimal. A reduction in the cost of testing is possible by reducing the number of sheep required to be tested at each accreditation. The recent reduction in frequency to every 3 years for some flocks is not the preferred method of cost reduction.

FOOTROT

Current situation. Most states have some control and/or eradication program for virulent footrot. There has been a lack of standardisation of testing and approaches between states which has and will continue to create problems for interstate movements.

The apparent success in reducing the prevalence of flocks infected with virulent footrot has meant there is increasing emphasis on low virulent strains, specifically benign and intermediate. It appears that low virulence strains may not be eradicated in programs which have successfully eradicated virulent strains of footrot (Allworth 1995).

Implications. There will be small numbers of seedstock producers affected as the control program attempts to deal with low, benign and some intermediate strains of footrot.

CONCLUSION

The disease most likely to affect seedstock producers in the short to medium term is JD. There will be pressure to become involved in a Market Assurance Program which will increase the cost of ram breeding, particularly for small studs and group breeding programs. Some studs will be found to be infected and they will face expensive eradication programs or will revert to commercial sheep production.

Artificial insemination and embryo transfer risks still need to be better evaluated to ensure artificial breeding presents a low risk of spread.

Worms resistant to nematodes will become an increasing industry concern as macrocyclic lactone resistance becomes more widespread and sheep breeders have to decide whether to select for resistance or hope for new technological approaches to worm control.

The two threats of JD and resistant worms will result in some producers re-arranging their breeding and management programs to minimise their potential exposure to other diseases which may emerge as a threat.

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