Brucella ovis: Recent developments and control options

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1. History to date

(See Scott, 1998; West *et al.* 1998, for full details of 1996-97 occurrences)

* **Winter 1996:** First stag discovered *B ovis* positive during semen collection by local veterinarian.
  Location: Canterbury
* **Mid-1997:** Widespread infection in a group of spikers. Detected during routine slaughter at a DSP
  Location: Canterbury
* **Late 1997:** New infection found by DSP vet during routine slaughter of stags.
  Location: Outram, Otago.
* **1998:** Two new infected farms:
  (a) Fairlie, Canterbury. Detected at DSP
  (b) King Country – North Island. The first North Island case once again detected at a DSP.
* **Late 1998:** North Island. Testicular lesions detected from 4 separate farms by local DSP. Lesions were detected at the following levels:
  - 3 of 16, 3 of 19, 3 of 15, 5 of 40.

  No *Brucella* was cultured. Some animals also had CFT-negative results.

2. New cases

The two new confirmed *B ovis* cases discovered in 1998 have allowed additional information to be added to the complex epidemiological puzzle. The North Island case was particularly interesting, as it was clearly geographically isolated from all the original properties involved.

2.1 North Island case details

* Large scale Central North Island hill country operation, running 600 MA hinds, velveting stags and finishing 450 weaners for venison.
* No animals had been purchased from the South Island for at least 10 years.
* The farm was running as a closed unit, ie: animals leaving go only to slaughter. The only animals purchased have been breeding stags. Most well known North Island studs have provided animals.
* Weaners are run on a separate finishing block 10 kms from the home farm from weaning until slaughter. NB: Post-rut weaning is the standard farm management system.
* Velvet stags are kept on the same block as the weaners but they are run on a distinctly separate area with a roadway providing a physical boundary.

* The only possible contact between the older stags and weaners is the occasional injured or weaker individual which remains on the weaner block and is joined with the following year's progeny.
* Extensive use of sheep for pasture control but no rams involved, only ewes and cryptorchid ram lambs. These could be a possible source of infection but the risk is believed to be modest based on current sheep information.
* Only indirect contact occurs with the sheep through adjoining fences and the occasional escaped lamb.
* Five 'dog-tucker' rams were carried in the season when infection was discovered. These may have had contact with the infected group and the *B. ovis* status of the rams was unknown.
* Velvet stags used on this property are home-bred. Some may have been purchased in the early years of deer farming.

2.2 Results

* Approximately 30 of 60 2-yr stags were infected when slaughtered in August. These animals were to be kept as velvet stags but were culled for venison as the velvet market appeared weak. Once again, infection levels approached 50% as has been seen on several other infected farms.
* Nineteen suspect testicles from this group were examined in detail along with serological and culture results (see Table 1).
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Table 1. Lesion description, culture and CFT results from 19 of approx. 30 2-yr stags with lesions at slaughter, 1998.

No	Lesion description	Inflammation	Histology Granulation	Interstitial lymphoid cells	Culture	C F T
1	4 mm suppurative	+++	+++	+++	+ve	+ve
2	N G L	++	–	++	+ve	-ve
3	N G L	–	–	–	-ve	-ve
4	1 mm caseous	–	–	–	-ve	-ve
5	1 mm caseous	+++	++	+++	+ve	+ve
6	N G L	–	–	–	+ve	+ve
7	N G L	–	–	–	-ve	-ve
8	4 mm x 3 mm caseous	+++	+++	+++	+ve	
9	3 x 2 mm caseous	+++	+++	+++	+ve	+ve
10	5 mm x 4 mm caseous	+++	+++	+++	-ve	+ve
11	5 mm suppurative	+++	+++	+++	+ve	+ve
12	5 mm suppurative – swollen	+++	+++	+++	+ve	+ve
13	N G L	+	–	+++	+ve	+ve
14	2 mm suppurative	+	–	+++	+ve	+ve
15	2 mm caseous	+++	+++	+++	+ve	+ve
16	N G L	–	–	==	+ve	-ve
17	2 mm caseous	–	–	+++	+ve	+ve
18	1 mm suppurative	++	++	++	+ve	+ve
19	N G L	–	–	++	+ve	Susp

Points to note from Table 1:

1. Lesions can be very small and difficult to detect by scrotal palpation alone. This makes for a very inaccurate screening test in deer. (In this case the bulk of some very small lesions may have been taken for culture, resulting in NGL results in the table presented).
2. Always complete both culture and CFT tests where possible as individuals can be +ve to 1 and –ve to the other on some occasions.
3. Culture and CFT results appear capable of detecting most infections.

2.3. South Island farm details

* Location – Fairlie, Canterbury
* Property only established as a deer unit approximately 4 years ago.
* Infection was found in July 1998 in 5 of 20 3-yr stags at slaughter.
* These animals had originally been kept for velvet production. They were the offspring of the first progeny bred and born on the property.
* The stags used to breed these animals were leased from a prominent Southland stud breeder. A number of years later these stags were on-sold to a new Southland deer farmer.
* The 20 stags slaughtered were from a mob of 26. After infection was detected the remaining 6 were tested serologically:
  - 2 CFT +ve
  - 2 CFT suspicious
  - 2 CFT –ve

  All were subsequently slaughtered.
* This farm is a Suffolk stud of 3000 ewes carrying 60 rams. It has been *B ovis*-free for 10 years with clear blood tests.
  - There is one sheep-farming neighbour only who is also *B ovis*-clear.
* The infected mob of stags was run with the older breeding stags as 2-year-olds at the end of the rut.
* The property pre-rut weans and has a very limited stock trading history.

3. Conclusions

* It is highly unlikely that the North Island infections are connected to known South Island cases.
* The origin of the original South Island cases discovered in 1996-97 is still not explained fully and further investigations are needed.

* Spread from sheep to deer is highly unlikely in the new South Island case. It can not, however, be ruled out in the North Island case.
* Well-known stud farms cannot be ruled out as a possible source of infection. They remain a possible link in both new properties.
* The case in Outram, Otago, still needs additional investigation as do the 2 new cases found in 1998. Remaining stags on these properties should be serologically checked and forward traces completed.
* It now appears probable that the disease has existed at low levels for many years and has avoided detection. Infected farms may be more numerous than first thought.
* Generally used management techniques employed on most farms may have limited disease spread and eliminated it from some properties, eg:
  - keeping sire stags separate
  - running spikers and 2-year-old stags as separate mobs away from older velvet stags
  - infection is probably self-limiting in older mobs of stags.

4. Discussion

* It is clear from the details presented in this paper that understanding this disease and its epidemiology is still at a very formative stage. The need for associated research, as is currently underway at Massey University, is clearly indicated.
* Emerging diseases will present interesting control problems in the future. As everything shifts to an industry-based USER PAYS environment, there is no longer a government-backed and funded service provider on tap. What happens, now that Producer Boards are under review and their funding options greatly reduced and very specifically targeted, remains an area of major concern. The ability to react rapidly with sufficient funding to an emerging disease problem is likely to be important.
* Disease investigation and associated essential research needs clear funding lines. If an issue does not attract or warrant adequate funding – don't bother with *ad hoc* investigation.
* Industry leaders must use veterinary expertise available and be capable of disseminating good and detailed information programmes along with clear directional comment. Political pressures should be kept well separated from disease investigation and control issues.
* Industry leaders must ensure that *someone* is the driver/collector of relevant information. Farmers confronted with emerging, unusual disease situations are highly suspicious of investigations by outside groups. They are most unlikely to provide detailed and valuable information through a questionnaire-type approach but they are usually willing and co-operative when a genuine and personal interest is shown in their worrying problem.
* The future for controlling diseases such as *B ovis* or Johne's lies with industry-based market assurance programmes. For *B ovis* in deer the approach would follow the guidelines presented by West *et al.* (1998) with concerned farmers voluntarily completing required testing to ensure freedom from the disease. As farmers become

more aware of the risks involved with *B. ovis* they will gradually increase commercial pressure when purchasing replacement breeding stock requesting assurances of a disease-free status.

The onus will remain "Buyer Beware" but the decision to investigate, research and implement a market assurance programme is one for industry leaders to make.

It is noteworthy that in 1999, for the first time, deer studs offered *B. ovis*-clear tested animals for sale.

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References

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