# *Brucella abortus* strain 19 in adult cattle

*Strain 19 vaccination of female cattle has been an accepted part of brucellosis control programmes in cattle for the last four decades, but its use at this time in New Zealand could lead to problems with brucellosis eradication.*

Being a live vaccine, strain 19 has the ability to establish itself in an animal. This occurs after initial inoculation and leads to the development of a strong immunity. Antibody titres which arise initially in response to vaccination gradually decline, so that animals vaccinated as calves will generally have low or non-existent titres when tested as adults.

In virtually all animals after immune stimulation, the organism is eliminated. In rare cases infection persists. In the context of a brucellosis control programme the existence of such strain 19 infected animals is of little importance. However, during the final phase of eradication when the prevalance of field strain *Brucella abortus* is very low, the few cases of strain 19 infection become increasingly important. We would therefore like to report on the occurrence of such cases during this final phase of eradication in New Zealand.

**Table 1: Age of animals from which strain 19 was isolated**

| *Age (years)* | 2 | 3 | 4 | 5 | 6 | 7 | >7 |
|---|---|---|---|---|---|---|---|
| *Number* | 3 | 2 | 0 | 2 | 1 | 0 | 5 |

**Table 2: Complement fixation titres of animals from which strain 19 was isolated**

| *CF titre* | 1/4 | 1/8 | 1/16 | 1/32 | 1/64 | >1/128 |
|---|---|---|---|---|---|---|
| *Number* | 0 | 0 | 1 | 1 | 4 | 7 |

Over a period from late 1983 to mid 1985 an intensive study of brucellosis breakdowns in the North Island was conducted. The objective of the study was to determine the reason why in most breakdowns where only one or two reactors were detected, despite the animals having moderate to high complement fixation titres, they appeared not to be spreading infection to other cattle. Another characteristic of such breakdowns was the inability to determine sources of infection. The results of this study have been published elsewhere.[1] Of special note was the isolation of strain 19 from four of 38 reactors examined.

As a result of these findings, reactors in the Waikato area were routinely cultured for brucella species, and since 1985 strain 19 has been isolated from a further nine animals. These isolations came from 27 attempts on reactors from 21 suspected breakdowns.

The age and complement fixation test titre distributions of all animals from which S19 isolations were made are given in tables 1 and 2 respectively.

All except one of the animals from which S19 was isolated were known to have been vaccinated with S19 as calves. One animal was not known with certainty to have been vaccinated, but neither could it be said that it was not.

## Discussion

Recovery of *Brucella abortus* S19 from vaccinated animals has been documented[2] and is not unremarkable, given the nature of the organism and the expectations derived from its use to protect against infection by the field strain of the bacillus.

Routine bulk milk ring testing of dairy herds had shown that all of the herds from which S19 isolates were made were considered to have been free of brucellosis for at least the previous 5 years. The existence of unusually long pre-patent periods during which the organism lies dormant within an infected animals has been reported on.[3,4] Isolation of S19 from milk for long periods following vaccination has been recorded.[2]

The apparent rather sudden manifestation of high titres owing to S19 in older animals must be seen to mimic the way in which field strains of the organism have been observed to behave following congenital infections. This should also serve to alert those concerned with maintaining surveillance of brucellosis that the sudden appearance of the disease some years after it was thought to have been eliminated should not be unexpected and can be explained. It also serves to reinforce the justification for whole herd depopulation of true breakdown herds during the final phase of an eradication programme.

## References

1 Ryan, T J, Young, G W, Hoyle, F P, Holland, J T S, Irwin, G, Jones, Yvonne, 1987: *Proceedings of the Asian-Australasian Animal Production Conference*, Ruakura, Hamilton, NZ, p 416.

2 Meyer, M E, Nelson, C J, 1969: *Proceedings of the US Animal Health Association*, p 96.

3 Plommet, M, Fensterbank, R, Renoux, G, Gestin, J, Philippou, A, 1973: *Annales de Recherches Veterinaires 4:* 419.

4 Lapraik, R D, 1982: *Veterinary Record, III:* 578–579.

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