A Longitudinal Study of Cattle Found Positive to the Interferon γ Assay for *Mycobacterium bovis* Infection: Preliminary Findings*

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Introduction

An impediment to the eventual eradication of tuberculosis from national cattle herds is the occurrence of outbreaks in which the standard procedures, consisting of tuberculin reactor removal followed by consequential tuberculin testing and surveillance, fail to identify all *Mycobacterium bovis* infected cattle. The recurring disclosure of tuberculin reactor cattle prolongs the period of restriction of these "problem herds" and affects the tuberculosis status of contiguous herds, and of the national herd as a whole. Furthermore, it undermines the confidence of herdowners in the national eradication programme.

The development of the interferon γ (IFN γ) assay for the diagnosis of tuberculosis in cattle, by Wood, Corner and Plackett (1990), offered a means of assessing the current cytokine status of the individual animal as regards *M. bovis* infection which was complementary to the tuberculin test. The reliability of the IFN γ assay when used in the Irish cattle herd has been reviewed by Monaghan *et al.* (1997).

The present study was undertaken to determine the value of the IFN γ assay as a means of identifying at an early stage the cattle in problem herds that were most likely to be infected with *M. bovis*.

Materials and Methods

The tuberculin testing history of 342 cattle in 24 herds was determined for up to two tuberculin tests performed within the 155 days following the IFN γ assay. All initial tuberculin reactors were removed at the index test. Where available, *post-mortem* examination findings were also included.

Results

Seventy two cattle positive to the IFN γ assay but which passed the index tuberculin test, were studied. Of these, 22 animals converted to tuberculin reactor status within the period. Two further animals disclosed tuberculous lesions at slaughter although they had passed the first post-index tuberculin test ten days previously. Concurrently, 12 of 270 other cattle that had been negative to the IFN γ assay, later converted to tuberculin reactor status within 155 days of the index tests (Table 1).

Conclusion

The IFN γ assay conducted at the initial phase of the investigation of these "problem herds" identified 22 of the 34 cattle which subsequently converted to tuberculin reactor status and two further animals which, though tuberculin-test negative, disclosed tuberculous lesions at slaughter some 75 days later.

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In the management of "problem herds" it is likely that, in most instances, the identification of high risk animals at the index test, based on the IFN γ assay results, would provide a rational basis for removing potentially infectious animals from such herds. Furthermore, it would serve to improve the confidence of herdowners in the overall eradication programme by providing a basis for reducing the period of herd restriction.

The use of the IFN γ assay in parallel with the tuberculin test as a standard risk management procedure for "problem herds" such as those described here, with provision being made for the purchase and immediate removal of animals positive to the IFN γ assay, is proposed.

Meanwhile, other means for the early identification of M. bovis-positive/tuberculin test negative and/or IFN γ assay-negative animals are required.

Table 1. Relationships between the response of cattle in 24 problem herds to the IFN γ assay and their subsequent tuberculin test status and *post-mortem* findings.

	Tuberculosis status		
	Positive	Negative	Odds Ratio
a. One tuberculin test at 65 - 80 days			
No. of animals IFN γ assay positive	19*	53	8.44
No. of animals IFN γ assay negative	11	259	
b. Two tuberculin tests within 130 - 155 days			
No. of animals IFN γ assay positive	22 (2)*	48	8.21
No. of animals IFN γ assay negative	12	197	
* In addition, two other cattle which were tuberculin test-negative, IFN γ assay positive disclosed tuberculous lesions at slaughter within 80 days of the IFN γ assay.			

References

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