



<b>Title</b>	Typing of Mycobacterium bovis isolates from cattle and badgers in the same locality
<b>Authors(s)</b>	Collins, John D., Collins, Daniel M., Delisle, Geoff W., Costello, Eamon
<b>Publication date</b>	1993-03
<b>Publication information</b>	Collins, John D., Daniel M. Collins, Geoff W. Delisle, and Eamon Costello. Typing of Mycobacterium Bovis Isolates from Cattle and Badgers in the Same Locality. University College Dublin. Centre for Veterinary Epidemiology and Risk Analysis, March, 1993.
<b>Series</b>	Selected Papers, 1992
<b>Publisher</b>	University College Dublin. Centre for Veterinary Epidemiology and Risk Analysis
<b>Item record/more information</b>	<a href="http://hdl.handle.net/10197/8916">http://hdl.handle.net/10197/8916</a>

Downloaded 2023-03-15T17:09:45Z

The UCD community has made this article openly available. Please share how this access benefits you. Your story matters! (@ucd\_oa)



© Some rights reserved. For more information

# Typing of *Mycobacterium bovis* Isolates from Cattle and Badgers in the Same Locality

J.D. Collins, D.M. Collins<sup>1</sup>, G.W. DeLisle<sup>1</sup> and E. Costello<sup>2</sup>

## Introduction

In the course of the investigation of outbreaks of tuberculosis in cattle in New Zealand Collins, Gabric and DeLisle (1987) demonstrated that the use of modern bacteriological typing methods to determine the nature and distribution of the causal agent, *Mycobacterium bovis*, in cattle and other animal species in the surrounding areas was of considerable epidemiological importance. The present paper describes the application of DNA restriction fragment analysis in the identification of *M. bovis* isolates recovered from cattle and badgers in the course of the investigation of nine separate herd breakdowns in counties Cavan, Cork, Limerick and Offaly during the period, November, 1989 - May, 1990.

## Materials and Methods

Twenty isolates of *M. bovis* recovered from cattle (12 isolates) and badgers (8 isolates) were typed using DNA restriction endonuclease analysis (REA) as described by Collins and DeLisle (1985). The restriction enzymes used were BstEII, PvuII and BclI, as these enzymes produced well-resolved patterns and distinguished between the different restriction types present. The analyses were carried out at the Wallaceville Animal Research Centre at Upper Hutt, New Zealand. The badgers from which the 8 isolates were recovered were examined after capture under licences issued in the course of the investigation of the outbreaks in question.

## Results

A total of 12 restriction types of *M. bovis* were identified (Table 1). Ten different

types were identified among the 12 isolates recovered from cattle. Each of the 8 isolates recovered from badgers belonged to a different restriction type; however, six of these isolates belonged to the same restriction type as did an isolate recovered from one of the cattle involved in the same breakdown in the course of the five-month period of the investigations.

## Discussion

The REA results demonstrated that there was a degree of heterogeneity among the *M. bovis* isolates recovered from animals in the four counties under study. An earlier report by Grange *et al.* (1990), which was based mainly on the results of biotyping, suggested that isolates from cattle, badgers and deer in Ireland were more homogenous than was found in this study. The present findings also confirmed that the same restriction type of *M. bovis* could be found both in cattle and badgers in the course of the investigation of an outbreak, as was shown to be the case in six of the nine herd breakdowns studied (Table 1).

The use of REA and related technologies, therefore, is likely to provide valuable epidemiological information concerning the pattern of tuberculosis in Ireland and can be of considerable importance in determining the nature and spread of infection in individual herd breakdowns. The application of these techniques is currently under active review by the Tuberculosis Investigation Unit.

<sup>1</sup> Agresearch Wallaceville Animal Research Centre, Upper Hutt, New Zealand.

<sup>2</sup> Veterinary Research Laboratory, Abbotstown, Castleknock, Dublin.

**Table 1.** DNA restriction endonuclease analysis of 20 isolates of *M. bovis* recovered from cattle and badgers in outbreaks of tuberculosis in 9 herds during the period, November, 1989 - May, 1990.

<u>Herd outbreak isolates reference No.</u>	<u>Combination of restriction enzyme patterns for <i>M. bovis</i></u>					
	<u>Isolates from cattle</u>			<u>Isolates from badgers</u>		
<i>Enzyme:</i>	<i>BstEII</i>	<i>PvuII</i>	<i>BclI</i>	<i>BstEII</i>	<i>PvuII</i>	<i>BclI</i>
Limerick (1)	3	4	1a			
	3	4	1a			
	3	4	1a			
	<u>2a</u>	<u>4</u>	<u>1a</u>	<u>2a</u>	<u>4</u>	<u>1a*</u>
Cork (1)	1a	1	2c			
Cork (2)	<u>1d</u>	<u>1b</u>	<u>2a</u>	<u>1d</u>	<u>1b</u>	<u>2a</u>
Cork (3)	<u>1</u>	<u>1c</u>	<u>2b</u>	<u>1</u>	<u>1c</u>	<u>2b</u>
Cork (4)	1a	1a	3	1c	1a	3
Cavan (1)	<u>1</u>	<u>1a</u>	<u>2b</u>	<u>1</u>	<u>1a</u>	<u>2b</u>
Cavan (2)	<u>1d</u>	<u>1</u>	<u>2</u>	<u>1d</u>	<u>1</u>	<u>2</u>
Offaly (1)	<u>2</u>	<u>2</u>	<u>1b</u>	<u>2</u>	<u>2</u>	<u>1b</u>
Offaly (2)	1b	3	1	2	2a	1b

\* isolates belonging to the same type are underlined.

## Acknowledgments

The authors wish to thank the members of the District Veterinary Offices and Regional Veterinary Laboratories for their valued assistance.

## References

Collins, D.E. and DeLisle, G.W. (1985). DNA restriction endonuclease analysis of *Mycobacterium bovis* and other members of the tuberculosis complex. *Journal of Clinical Microbiology* 21: 562-564.

Collins, D.E., Gabric, D.M. and DeLisle, G.W. (1987).

Typing of *Mycobacterium bovis* isolates from cattle and other animals in the same locality.

*New Zealand Veterinary Journal* 36: 45-46.

Grange, J.M., Collins, J.D., O'Reilly, L.M., Costello, E. and Yates, M.D. (1990).

Identification and characteristics of *Mycobacterium bovis* isolated from cattle, badgers and deer in the Republic of Ireland. *Irish Veterinary Journal* 43: 33-35.