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A Comparison of Rates of Disclosure of Tuberculous Lesions at Slaughter in Tuberculin Reactor Cattle in Singleton and Multiple Animal Breakdowns

K. Towey and J.J. O’Keeffe

Introduction

An analysis of the pattern of herd breakdowns as identified in the National Tuberculosis Eradication Programme showed that 52 % of herds were placed under movement restriction as a result of a single animal being identified as a tuberculin reactor at the index test (O’Keeffe, 1993). In order to ascertain differences between these and other breakdowns involving more than one animal a study of the rate of disclosure of tuberculous lesions in tuberculin reactors from single animal breakdowns and multiple animal breakdowns was undertaken. The usefulness of the difference in the response to tuberculin at the bovine and avian tuberculin injection sites at the time of identification of the animals as reactors as a point of reference was also assessed. Any differences present might afford an explanation for “within herd spread of infection” in the latter breakdowns.

Materials and Methods

Data relating to the tuberculin testing record of individual reactors to the single intradermal comparative tuberculin test identified in singleton and multiple animal breakdowns over the period, 1989 to 1994 inclusive, were analysed in association with the rate of disclosure of a tuberculous lesion(s) at slaughter in such animals. For the purposes of comparison the difference in millimeters between the increase in skin thickness at the site of injection of the avian and bovine tuberculins was used as

the index of tuberculin reactivity. Analyses based on test type (e.g. round test, reactor test, contiguous herd test), animal type (cow, steer, heifer, other), herd enterprise type, and on the season of the year in which the index test was conducted, were also performed.

Results and Discussion

The differences in the responses to avian and bovine tuberculins in 42,123 reactor cattle in singleton reactor herds and in 174,558 reactor cattle in multiple animal reactor herds, together with the rates of disclosure of tuberculous lesions at slaughter in these two populations are presented in Figure 1. While the lesion disclosure rates in both groups was similar, viz. 32.7% in single animal breakdowns and 32.5% in multiple animal breakdowns, reactor animals from multiple animal breakdowns were more likely to display lesions provided the local response to the injection of bovine tuberculin was 3 mm. or greater than the response to the avian tuberculin. Analyses based on test type in these two categories gave broadly similar results. Multiple animal breakdowns yielded a higher lesion rate at each skin difference measurement interval up to 20 mm. at the round or contiguous herd test; this difference was not observed in animals that had been identified as reactors at other types of tests. In animals showing a difference in tuberculin reactivity greater than 20 mm., the likelihood of disclosing a tuberculous lesion, in general, increased but was not consistent.

The lesion disclosure rate by season in both populations is presented in Figure 2. Again, reactors from multiple animal breakdowns were more likely to display tuberculous lesions at slaughter at all times throughout the year. Within the multiple animal breakdown group, (Figure 3) however, reactors slaughtered in the Spring had higher lesion rates than those slaughtered in the Winter; lowest lesion rates were recorded in animals identified as reactors in the Summer and Autumn. No such pattern was evident in the single animal breakdown herds.

The results of this study support the hypothesis of intra-herd spread of *Mycobacterium bovis* infection and that such spread, when it occurs, is most likely to take place during the Autumn and Winter months.

Reference

O’Keeffe, J.J. (1993). Bovine Tuberculosis: Risk Assessment on Single Animal Breakdowns Situations (SABS). In: Tuberculosis Investigation Unit, University College Dublin, Selected Papers 1993, 8-11.

Figure 1. A comparison of the relationship between the rate of disclosure of tuberculous lesions in reactors from single and multiple animal breakdowns and the difference (in mm.) in the local response to the intradermal injection of avian and bovine tuberculosis.

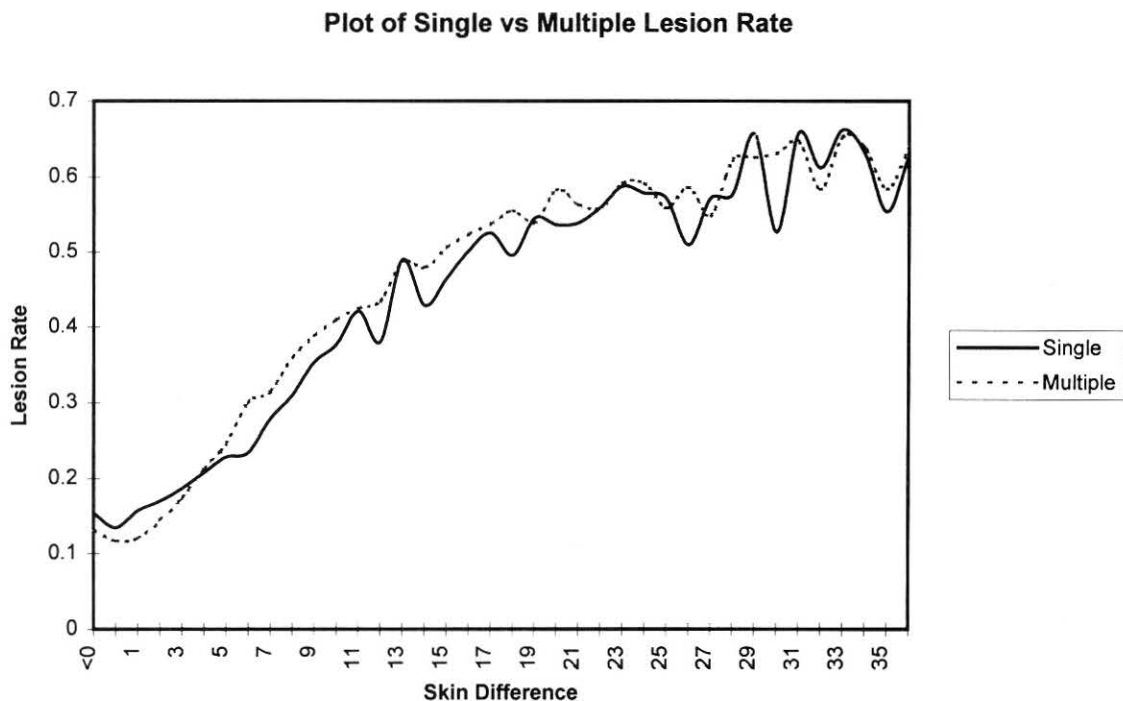


Figure 2. A comparison of the relationship between the rate of disclosure of tuberculous lesions in reactors in single and multiple animal breakdowns and the difference (in mm.) as the local response to the intradermal injection of avian and bovine tuberculins, by season.

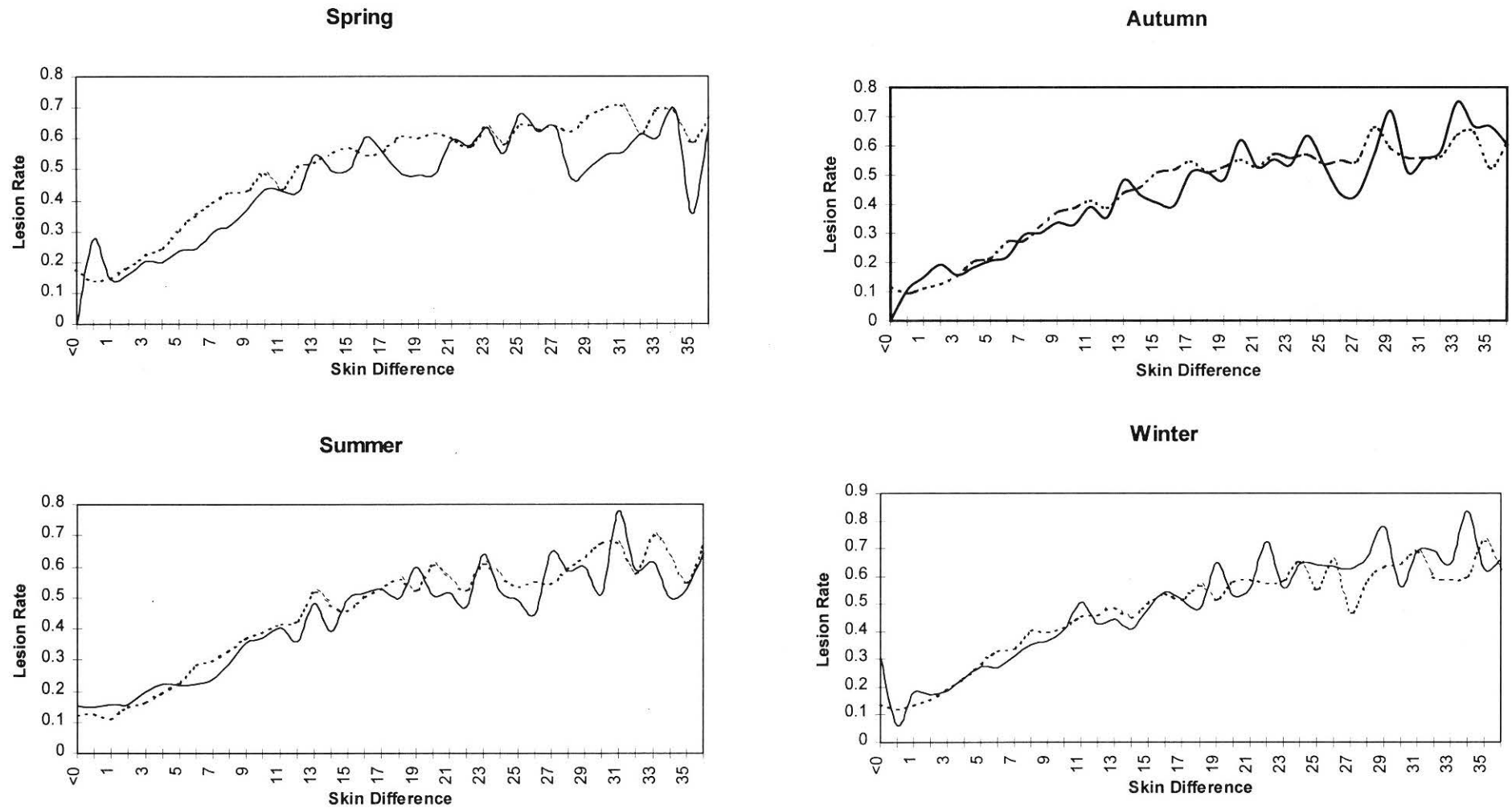


Figure 3. Relationship of rate of disclosure of tuberculous lesions in reactors in multiple animal breakdowns and the difference (in mm.) in the response to the intradermal injection of avian and bovine tuberculins, by season.

