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<b>Authors(s)</b>	Fallon, Richie J.
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# Relationship between the Number of Bullocks and Number of Cows in Dairy and Suckler Herds and the Rate of Disclosure of Reactors to the Tuberculin Test

R.J. Fallon

## Introduction

The rate of disclosure of tuberculin reactors in the Irish cattle population has remained constant over the past 15 years during which period some 30,000 animals have been so identified each year. An earlier study failed to show any effect of enterprise type on the rate of disclosure of tuberculin reactors (Fallon, 1995). The definitions of cattle enterprise category used (Fallon, 1995) did not allow for the dilution effect of calves or bullocks on the rate of disclosure of reactors, however.

The present study was undertaken on the national cattle herd over the 6-year period, 1988 - 1993, to determine the effect of enterprise type, viz. dairy, suckler or drystock, on the rate of disclosure of tuberculin reactors when adjusted for calf and bullock numbers.

## Materials and Methods

The national cattle population data base for the period 1988-1993 were used. The data were interrogated on a herd unit basis. A herd was defined as a unit having cattle present at a full herd tuberculin test during the year in question. Herds with no test or having no stock in the period 1991/1993 were deleted from the analysis.

Cattle enterprise categories were defined as follows:

1. Dairy - herds which had:
  - a) been assigned a brucellosis milk ring test in 1993, based on milk supplied to a creamery;
  - b) did not have any cows eligible for beef cow *premia*; and
  - c) had cows in the herd in 1993.

2. Suckler - herds which were:
  - a) eligible for beef cow *premia* payments in 1992 and/or 1993; and
  - b) herds which had cows in 1993.
3. Drystock - herds which had:
  - a) no cows in 1993;
  - b) no milk ring test results in 1993; and in which
  - c) no cows were eligible for beef cow *premia* in 1992 and/or 1993.

Herds were also classified on the basis of the following animal categories present at a full test in 1993:

### Bullocks

- B1. Herds with 40 or more bullocks
- B2. Herds with 20 to 39 bullocks
- B3. Herds with less than 20 bullocks

### Cows

- D1. Herds with 20 or more dairy cows
- D2. Herds with less than 20 dairy cows
- S1. Herds with 20 or more suckler cows
- S2. Herds with less than 20 suckler cows

The rate of disclosure of tuberculin reactors was expressed as the number of reactors/1000 animals/annum in each category. This method, which was employed in order to overcome differences in herd sizes, differs from the reactor animals per 1,000 animal tests (APT).

Each herd was assigned to a region on the basis of its geographic location according to county, as follows:

Western - Donegal, Sligo, Leitrim, Mayo, Roscommon, Galway and Clare

Sth. West -	Limerick, Kerry, Cork, Waterford, and South Tipperary
East -	Louth, Meath, Dublin, Kildare, Wicklow and Wexford
Midland -	Cavan, Monaghan, Longford, Westmeath, Offaly, Laois, Kilkenny, Carlow and North Tipperary

## Results

The test records of 6.2 million animals were examined annually over a six-year period to determine the effect of number of bullocks in the herd on the rate of disclosure of tuberculin reactors. There were definite regional differences on the disclosure rate of tuberculin reactors, being lowest in the West and South and greatest in the Midland (Table 1). However, within each region there was no effect of enterprise type or number of bullocks within each enterprise type on the disclosure rate of tuberculin reactors. The exclusion of calves from the disclosure rate did not affect the relative values between or within enterprise type. However, the exclusion of calves had the effect of increasing disclosure rate by 1.3, 1.1, 1.0 and 1.6/1000 animals for West, South, East and Midland regions, respectively.

The test records of 5.5 million animals were further examined annually over a six-year period, in order to determine the effect of numbers of cows in herds on the annual rate of disclosure of tuberculin reactors within the dairy and suckler categories (Table 2). There was no apparent difference in the disclosure rate between suckler cow herds with 20 or more cows, compared to herds with less than 20 cows, irrespective of whether or not calves were included in the data set. In contrast, when the disclosure rate of reactors for the dairy category was compared, it was found that the disclosure rate was consistently greater for herds with less than 20 cows for all regions. The difference was greater, at 2.3/1000 animals in the Midland region, which also had the highest reactor disclosure rate. The difference between dairy herds with 20 or more cows and dairy herds with <20

cows was greater when calves were excluded from the data, the difference in the Midland region increasing to 2.5/1000 animals. This pattern of difference between herds with 20 or more cows and herds with <20 cows was not evident in suckler herds.

## Discussion

The number of bullocks present in a herd did not affect the rate of disclosure of reactors in any of the three cattle enterprises examined within any of the four regions. The region trends were similar to those reported earlier by Fallon (1995).

In contrast, when the dairy category was subdivided into herds with 20 or more cows and herds with <20 cows, the rate of disclosure of tuberculin reactors was greater in the latter group in all four regions. It is very difficult to provide an appropriate explanation for this difference. Dolan, *et al* (1995) showed that the tuberculous lesion rate among attested cows was higher than for bullocks, heifers or calves. This suggests that the 20 or more cow group would be likely to have a higher rate of reactor disclosure than the <20 cow group. In fact, the opposite occurred (Table 2).

The relatively high rate of reactor disclosure among all enterprise categories in the Midland region is yet a further issue which requires an explanation. The difference between the South and Midland region was 2-fold for the dairy category when calves are excluded.

## References

- Fallon, R.J. (1995). Effect of cattle enterprise type on the rate of disclosure of tuberculin Reactors In Tuberculosis Investigation Unit, University College Dublin, Selected Papers 1994, 20 - 25.
- Dolan, L.A., Costello, E and Quigley, F. (1995). Confirmed tuberculous lesions in non-tuberculin-reactor cattle slaughtered at export meat plants in the Republic of Ireland (1998 to 1994). In Tuberculosis Investigation Unit, University College Dublin, Selected Papers, 1994, 35 - 38.

**Table 1. Relationship between the number of bullocks in herds and the rate of disclosure of tuberculin test reactors, (expressed as the number of reactors/1000 animals/annum).**

Regional Location Enterprise	<u>Number of Bullocks</u>		
	<u>Less than 20</u>	<u>20 - 39</u>	<u>40 or greater</u>
<u>(i) Including Calves</u>			
West			
Dairy	3.8	3.5	3.3
Suckler	4.5	5.1	6.5
Drystock	5.5	6.7	4.4
South			
Dairy	3.6	4.0	3.9
Suckler	3.7	4.6	3.7
Drystock	3.6	4.4	3.5
East			
Dairy	5.2	5.3	6.9
Suckler	4.6	5.2	4.2
Drystock	5.5	4.8	4.8
Midland			
Dairy	8.0	7.2	6.9
Suckler	7.3	7.4	6.5
Drystock	8.3	7.3	5.9
<u>(ii) Excluding calves</u>			
West			
Dairy	4.8	4.5	4.2
Suckler	6.0	6.2	7.8
Drystock	5.7	6.8	4.5
South			
Dairy	4.7	5.3	4.9
Suckler	3.6	4.4	3.5
Drystock	4.0	4.7	3.7
East			
Dairy	6.2	6.6	8.2
Suckler	5.8	6.4	4.9
Drystock	5.9	5.0	5.0
Midland			
Dairy	10.0	9.0	8.3
Suckler	9.5	9.1	7.5
Drystock	8.7	7.6	6.0

**Table 2. Relationship between the number of cows in dairy and suckler herds and the annual rate of disclosure of tuberculin test reactors, (expressed as the number of reactors/1000 animals).**

Region	Cow Category			
	Dairy Herds		Suckler Herds	
	<u>&gt;19</u>	<u>&lt;20</u>	<u>&gt;19</u>	<u>&lt;20</u>
<u>Including calves</u>				
West	3.5	4.3	5.3	4.5
South	3.6	5.1	3.8	3.9
East	6.0	7.9	4.1	4.9
Midland	7.1	9.4	6.9	7.3
<u>Excluding calves</u>				
West	4.4	5.3	7.5	5.8
South	4.0	5.7	5.2	5.5
East	7.3	9.3	5.3	5.8
Midland	8.9	9.1	9.1	8.9