Short Communication

RETROSPECTIVE SEROLOGICAL STUDY ON BLUETONGUE ANTIBODY PREVALENCE IN A LOUISIANA HERD

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Previous studies on the prevalence of bluetongue antibodies in south-eastern Louisiana herds, essentially Louisiana State University herds, since 1978 indicate that herd prevalence rates averaged 55% and for animals of two years of age or more were within the 50 to 100% range (Fulton, Nicholson, Pearson, Potter, Archibald, Pearson and Jochin, 1982). The overall prevalence of bluetongue antibodies for the State of Louisiana as determined in 1980 to 1981 is 28%. Data are not available for the period prior to 1978. At the time the sera from Louisiana State University herds was collected during 1957 to 1962 no test was available for sero-epidemiological studies. This sera was originally collected by E. Roth as part of a leptospirosis study, stored at -18°C, rescued and organised into a serum bank in 1979 to 1980. This study was carried out to determine the differences, if any, in antibody prevalences in LSU herds as currently reported.

All sera used were derived from this collection and three separate test runs were conducted. The first test was carried out upon 121 samples derived from the LSU dairy herd and randomly selected from three age groups: four to 12 months; 13 to 24 months; and 25+ months of age, each in two periods of time - 1957 to 1959 inclusive and 1960 to 1962 inclusive. The purpose of structuring the sample in this way was to obtain indicators of the prevalence rates in each of these six categories which were to be used as guidelines for selection of further samples for more detailed investigation.

As all results from the first test were negative a second test was carried out involving 112 randomly selected samples from older animals in three herds. Two of these samples proved positive and a third test run of 67 serum samples was conducted concentrating upon older animals sampled during the period 1957 to 1959. Details of the structuring of the three samples are given in Table I. Subsequently a search was made for other sera from positive animals. Four further samples from one animal were found and tested.

A microgel diffusion technique (Fulton et al, 1982) was conducted for all samples using an antigen and control antiserum. All plates were read after 24 h; the bovine serum was used undiluted. Two of the 300 sera tested were found to be positive. One of these was collected on 9 September 1958 from a 12½ year old Guernsey cow (cow 2) in the LSU dairy herd. Sera collected from the same

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4Obtained from Dr G. M. Brown, US Department of Agriculture, National Veterinary Service Laboratory, Animal and Plant Health Inspection Service, Ames, Iowa.
TABLE I
Sera selected for bluetongue antibody testing by herd, age group and sampling period

<table>
<thead>
<tr>
<th>Test</th>
<th>Age (months)</th>
<th>Sampling period</th>
<th>LSU dairy</th>
<th>LSU bull stud</th>
<th>Jeanerette dairy</th>
<th>Jeanerette beef</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>4-12</td>
<td>1957-1959</td>
<td>20</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>13-24</td>
<td>1957-1959</td>
<td>20</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>25+</td>
<td>1957-1959</td>
<td>20</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>4-12</td>
<td>1960-1962</td>
<td>20</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>13-24</td>
<td>1960-1962</td>
<td>20</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>25+</td>
<td>1960-1962</td>
<td>21</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>2</td>
<td>13-24</td>
<td>1957-1962</td>
<td>25</td>
<td>1</td>
<td>6</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>25-48</td>
<td>1957-1962</td>
<td>30</td>
<td>-</td>
<td>5</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>49+</td>
<td>1957-1962</td>
<td>28</td>
<td>3</td>
<td>14</td>
<td>-</td>
</tr>
<tr>
<td>3</td>
<td>25-48</td>
<td>1957-1959</td>
<td>2</td>
<td>-</td>
<td>-</td>
<td>27</td>
</tr>
<tr>
<td></td>
<td>49+</td>
<td>1957-1959</td>
<td>19</td>
<td>10</td>
<td>2</td>
<td>7</td>
</tr>
<tr>
<td>Totals</td>
<td></td>
<td>1957-1962</td>
<td>225</td>
<td>14</td>
<td>27</td>
<td>34</td>
</tr>
</tbody>
</table>

animal on 10 September 1957, 17 February 1958, 7 April 1959 and 3 May 1961 were also tested and found to be negative for bluetongue. The other positive sample was collected on 20 March 1962 from a seven and a half year old Jersey male. This bull had been purchased from Florida; no other serum from this animal was in the collection.

As the number of sera found to be positive (two out of 300) was less than expected further testing was carried out to determine whether the sera selected had lost all precipitation activity. Ten of the sera found to be negative for bluetongue collected from LSU dairy herd animals over five years of age when sampled were tested for the presence of enzootic bovine leucosis (EBL) antibodies using a structured microgel diffusion test (Miller and Olsen, 1972); parallel studies have shown that essentially 100% of these cattle sera are EBL sero positive (Hugh-Jones, Moorhouse and Seger, 1984). Nine of the 10 bluetongue-negative samples tested for enzootic bovine leucosis were found to be positive for antibodies to this virus.

The EBL testing of a randomly selected sample of the sera negative for bluetonge antibodies—to check for the presence of normal diffusible antibody able to participate in precipitin reactions—confirmed that such antibody was present. Preferential loss of specific activity within this group of immunoglobulins would not be expected to occur in the normal course of events. The microgel diffusion test for bluetongue antibodies has a high sensitivity and false negative results are thus not expected. Two possible reasons are forwarded for the very low bluetongue prevalence rates detected: (a) that the negative test results each represent a true negative status; or (b) that initial bluetongue titres were relatively far lower than those of EBL. Extrapolating the findings of the Leptospira pomona validation tests to precipitating antibodies carried out on this sera (Moorhouse, Hugh-Jones, Barta and Swann, 1982) does not support this latter contention. In addition undiluted serum was used for all tests. Therefore the absence of bluetongue antibodies is possibly real and not due to mishandling of the frozen sera.

Only one of the serum samples from cow 2 were positive for bluetongue. This either means that the animal sero-converted during this short time or that it is a