Serological screening of calves’ neonates enteritis ethiology

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Abstract. In this study performed in six months in three bovine herds are obtained the results after serological tests of faeces samples. The samples were from neonates calves with digestive disorders, with diarrhea and dehydration. Necropsic lessions were characteristic to Cryptosporidium parvum, Escherichia coli and rotavirus infection. Laboratory test was made by Test strips for detection of E. coli, rotavirus, coronavirus and C. parvum in bovine faeces „Rainbow Calf Scour 4” (BioX Diagnostic) for 56 feces samples. From all these samples 26 were positive as it follows: 3 samples positive for Cryptosporidium, 17 samples positive for E. coli and 6 samples positive for rotavirus.

Keywords: Cryptosporidium parvum; Escherichia coli; Rotavirus; Calves; Rapid diagnosis.

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Introduction

Worldwide, cattle intensive production system represents a very important part of agriculture because its diversity, productions, and economical impact (Radostits et al., 2000).

Even if in our country usually found, neonates calves’ enteritis remains a problem even in small farms (with 20 to 100 dairy cows) because neonates pathology will appear and will produce important economical losses. Diarrhea is common in newborn calves and other animal species. The clinical presentation can range from mild diarrhea without systemic disease to profuse diarrhea associated with rapid dehydration, severe disturbance of acid-base and electrolyte balance, and death, sometimes in as few as 12 hrs (Moga Mânzat, 2002). Several enteropathogens are associated with diarrhea in neonates (Moga Mânzat, 2007; Murphy et al., 1999). The most prevalent infections are Escherichia coli, rotavirus, coronavirus, and Cryptosporidium parvum (Boch et al., 1983; Dărăbuș, 1997).

Materials and methods

The researches were made during 5 months in three bovine farms in Caraș-Severin county. In farm 1 there were 500 dairy cows, in farm 2 – 480 dairy cows, and in farm 3 – 370 dairy cows. From these farms were taken in study calves between 1 and 10 days of age. A total of 56 diarrheal feces were used in this study as it follows: 13 samples from farm 1; 7 samples from farm 2 and 36 samples from farm 3.
In these farms were made epidemiological and clinical investigations.

Laboratory test was realized by a rapid test Rainbow Calf Sour 4 (Bio-X Diagnostics s.p.r.l., Belgium) which allows diagnosis of infection with four pathogens frequently involved in neonates diarrhea: rotavirus, coronavirus, *E. coli* F5 (K99) and *C. parvum*. The test contains four strips, different colored, depending of antigen: red strip for rotavirus, yellow strip for coronavirus, blue strip for *E. coli*, and green strip for *Cryptosporidium*.

**Results**

Researches show that three enteropathogens were involved in calves' diarrhea in all studied farms. Epidemiological investigations show that none of these farms was immunisated against four pathogens studied.

Number of calves with diarrhea varied from farm to farm (table 1). The lowest percent of calves with diarrhea was registered in farm 2 (5.18%), and the highest percent was in farm 3 (29.26%).

All fecal samples were tested with rapid test Rainbow Calf Sour 4 and the results were interpreted according by producer recommendations. The results are presented in table 2. As it could be observed from the total number of samples (56), after testing were obtained 26 positive samples, from which: 17 for *E. coli*, 6 for rotavirus, 3 for *Cryptosporidium* and none of the sample for coronavirus. None of the sample was positive for more than one pathogen.

<table>
<thead>
<tr>
<th>Farm</th>
<th>No of calves examined</th>
<th>Calves with diarrhea</th>
</tr>
</thead>
<tbody>
<tr>
<td>Farm 1</td>
<td>101</td>
<td>13</td>
</tr>
<tr>
<td>Farm 2</td>
<td>135</td>
<td>7</td>
</tr>
<tr>
<td>Farm 3</td>
<td>123</td>
<td>36</td>
</tr>
<tr>
<td>Total</td>
<td>359</td>
<td>56</td>
</tr>
</tbody>
</table>

Analyzing all the three studied farms it can be observed that:

- In farm 1, from the total of 101 examinat ed calves, 13 have had diarrhea; from these 13 diarrheic samples, were positive 9 samples: 5 samples for *E. coli*; 3 samples for rotavirus and one sample for *Cryptosporidium parvum*. The percent of calves with diarrhea was 12.87.

- In farm 2, from the total of 135 examinated calves, 7 have had diarrhea; from these diarrheic samples, were positive 4 samples: one sample for *E. coli*; 2 samples for rotavirus; one for *Cryptosporidium parvum*.

- In farm 3, from the total of 123 examinated calves, 36 have had diarrhea; from these diarrheic samples, were positive 13 samples: 11 samples for *E. coli*, one sample for rotavirus; and one sample for *Cryptosporidium parvum*. The percent of calves with diarrhea was 29.26.

*E. coli* infection was the most frequent cause of calves enteritis (17 positive samples from 56 analyzed), followed by rotavirus infection (6 positive samples from 56 tested) and *Cryptosporidium* infection (3 positive samples).

<table>
<thead>
<tr>
<th>Farm</th>
<th>No of calves with diarrhea</th>
<th><em>E. coli</em> (K99)</th>
<th>No. of positive samples for:</th>
<th><em>C. parvum</em></th>
</tr>
</thead>
<tbody>
<tr>
<td>Farm 1</td>
<td>13</td>
<td>5</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>Farm 2</td>
<td>7</td>
<td>1</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Farm 3</td>
<td>36</td>
<td>11</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>56</td>
<td>17</td>
<td>6</td>
<td>0</td>
</tr>
</tbody>
</table>
Discussions

The highest infection percent obtained in farm 3 (29.26) is due to *E. coli* K99 infection, which is rapid propagated, having a high pathogenic importance for calves.

The results are different from those found in the literature. In similar studies, the causes of calves enteritis were *E. coli* (1.3-4.6%), Rotavirus 0.31-0.66, and *C. parvum* was detected in 4 calves/farm. The difference between the results can be explained by the fact that in the studies reported in the literature, the prevalence of infection was reported per total number of animals, and in this study the report was made at age category which is sensible for studied enteropathogens (Bartels et al., 2010).

References


