EFFECT OF SUPPLEMENTATION OF PROBIOTIC ZOOVIT IN DIETS OF CALVES OF MILK BREED

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Abstract


The study was conducted to determine effect of probiotic on performance, health status and hematological parameters of female calves of Bulgarian Brown Breed and Black and White Breed. Calves were assigned to four experimental groups of 10 days age. All calves were weaned on the 90th day. Calves of probiotic groups received 12g probiotic daily with the morning milk. Feed intake, body weight gain and general health condition of all calves were observed per 10 days.

The results showed that there were no differences in feed intake, and blood parameters. Calves fed with probiotic were healthier than the control calves. It was found that addition of probiotic had positive effect on average daily gain in calves of Black and White Breed.

Key words: calf, probiotic, health, blood, average daily gain

Introduction

Antibiotics prevent infections caused by pathogenic bacteria (Fuller, 1989), but their application cause drug resistance and disorders of the intestinal bacterial population (Abe et al., 1995). Probiotics are beneficial live microorganisms (bacteria, yeasts, fungi) that can be added to food or water as single and mixed cultures. (Todorov et al., 2007). In newborn animals when milk is their main food, stomach tissue structure is still underdeveloped. Probiotics alter the flora in the intestine, thereby preventing cases of diarrhea in calves and lambs, they increase the speed of development of rumen flora and fauna, and they lower mortality, reduce the cost of feed per unit gain and thus accelerate weaning.

Jukna et al. (2003) reported that the experimental group calves received probiotic had normal hematological parameters and they are a good indicator of health status. On the other hand, Huska et al. (2002) did not establish a significant difference in hematological, immunological, mineral and energy profile between the experimental and the control groups. However, probiotics have a positive impact on cases of digestive problems, welfare and growth of the experimental groups.

The aim of this study was to determine the influence of probiotic product Zoovit average daily gain, health and some hematological parameters of female calves from dairy breeds in the suckling period.

The experiment was carried out in the experimental base of Agricultural Institute Stara Zagora with 34 calves at the age of 10 days, assigned to two groups - control and experimental. In each group of calves were allocated an equal number of Bulgarian Brown cattle (BBC) and Bulgarian Black and White Cattle.

Calves from different groups were aligned by age and body weight. All calves were kept under identical
conditions, in individual cells of an open space for 80 days during the suckling period. All calves were weaned at the age of 90 days. During the experimental period the calves received 2.5 l milk replace twice a day.

In the morning, feeding each calf from the experimental group received a 12 g probiotic.

All calves have received a granular mixture and water. To establish a hematology parameters blood samples were taken at the beginning and end of the test period. Blood samples were taken from *v. jugularis*, and heparin was used as an anticoagulant. Samples were analyzed for the following parameters: total protein, calcium, phosphorus, hemoglobin, erythrocytes and leukocytes.

During the trial, the healthy condition of the calves was monitored daily. Individual weighing over 10 days monitored weight development of the animals.

**Results and Discussion**

Table 1 shows the average daily gain of calves for the experimental period. Average daily gain was 0.737 kg in the experimental group and 0.659 kg respectively in the control group. The difference between the two groups was 11.8% and it was not statistically significant.

The positive effect of probiotics was found in Abe et al. (1995) with calves to 25 days of age. Hossani et al. (2010) reported that the groups with probiotic and antibiotic had significantly higher body weight than the control group (p < 0.05), which is consistent with Higginbotham and Bath (1993), who conducted experiments in the first month of birth and Abdala et al. (2002) who reported a significant difference in the growth of the probiotic group between 21st and 42nd day. In contrast, Morrill et al. (1995), Kamra et al. (2002) and Gorgulu et al. (2003) reported no significant difference in average daily gain in the control and experimental groups.

Table 1

**Average daily gain of calves for experimental period**

<table>
<thead>
<tr>
<th>Item</th>
<th>n</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>SE</th>
<th>SD</th>
<th>CV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental group</td>
<td>17</td>
<td>0.525</td>
<td>0.887</td>
<td>0.737</td>
<td>0.023</td>
<td>0.096</td>
<td>0.130</td>
</tr>
<tr>
<td>Control group</td>
<td>17</td>
<td>0.412</td>
<td>0.800</td>
<td>0.659</td>
<td>0.029</td>
<td>0.120</td>
<td>0.182</td>
</tr>
</tbody>
</table>

Figure 1 shows the changes in average daily gain in calves of Bulgarian Brown Cattle during the test period. The experimental group had most intensive growth from the 40th to the 70th day. After this period, the control group had a higher rate than the experimental group. The results are probably due to the more rapid development of rumen microflora in experimental animals. The highest growth was at the end of the test period in both groups.
The trend to higher average daily gain was more distinctive in calves of Bulgarian Black and White cattle in Figure 2. In the experimental group, the surplus is gradually increased, with the highest at the age of 60 days. Experimental group has a higher rate, with the exception of the fourth weighting, where the rate is higher in the control animals. The highest gain of the experimental group had highest gain than control group. Growth gradually grows in the control group, whereas two peaks – on the 50th and 80th day.

Table 2 presents the results of blood tests of calves of both groups at the beginning and at the end of the test period. The data shows that hematology parameters were normal in both groups, which is a sign of good health. In the experimental group, hemoglobin increased at the end of the experimental period by 13.5%. Similar results were seen in Stoykov et al. (2001) in an experiment with calves, hemoglobin increased in the experimental group and decreased in the control at the end of the test period.

The level of leukocytes in experimental group was lower than the control, which indicates better health condition. There were no significant differences in blood parameters between the two groups at the beginning and the end of the test period.

Table 3 presents observations on the health condition of calves. It is noteworthy that in the experimental group only one calf had digestive problems and in the control group was 3 sick calves. Similar results are received and Stoykov et al. (2001) and Gorgulu et al. (2003), reported that in the cases of diarrhea, calves from the experimental group were healthier than those in the control group.

Conclusions

As a result of the experiment and analysis, it was found: Adding of probiotics Zoovit in calves of Bulgarian Black and White Cattle and Bulgarian Brown Cattle stimulates the metabolism and increases the intensity of growth after 40 days of age. Differences in growth of the two groups were not statistically significant. It was found that animals that received probiotic had better health condition. There were no significant differences in blood parameters between the two groups.

References


