Use of Natural Feed Supplements that Help to Improve Health Status of Calves

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Abstract
The basis for each cattle farming are healthy and strong individuals. The aim of this study was to determine which of the given feed supplements have the greatest effect on live weight gain of calves in the early period after weaning from mother to infant milk substitutes. The research was conducted from July 2014 to December 2014. After the birth calves were weaned into individual boxes in the barn, where during the first 21 days of life their feeding ration was enriched with feed supplements. On the basis of the added supplement calves were divided into three experimental groups and one control group. First weighing of calves was done after birth and the second after 30 days. From the results of observations it can be concluded that feed supplements are accepted positively by calves in the first days of life and have a positive beneficial effect on weight gain and general health of calves.

Keywords: homeopatics, prebiotics, probiotics, weight gains

1. Introduction

Born calf has sterile gastrointestinal tract after birth, but when they are three days old coliforms predominate in the feces compared with lactobacilli and bifidobacterial flora. During the period of colostrum calves prone to diarrhea, which can lead to high numbers of mortality [1]. Conventional and unconventional treatment presents a significant risk of side effects, as well as, “placebo effect” and suggestive aspects [2]. Probiotics were defined as live microbial supplements which beneficially affect the microbial balance of the host. Systemic administration stimulates the growth of other microorganisms, the mucosal and systemic immunity and improves the nutritional and microbial balance of the intestinal tract [3]. Most of probiotic bacteria belong to the genus *Lactobacillus* and *Bifidobacterium*. They produce the lactic acid, which forms the main part of the intestinal microflora in animals. Further probiotic microbes forming an important component are yeast plants (*Saccharomyces boulardii*) and some of non-pathogenic strains of *E. coli* and Bacillus spp., that are normally found in the gastrointestinal tract [4]. The importance of probiotics and prebiotics is based on their ability to stabilize the inner microbiota and to influence the calves’ health and welfare. Positive effects of *Ascophyllum nodosum* on the reduction of pathogen *E. coli* O157:H7 were proved in the case of cattle and sheep [5]. The effect of *Lactobacillus* sporogenes on *Salmonella dublin* was verified by Frizzo et al. (2011) [6], the effect of *Lactobacillus* on the started feed intake and on the weight gain by Higginbotham and Bath (1993) [7] and the effect of *Lactobacillus acidophilus* on the occurrence of calf diarrhoeas by Tarboush et al. (1996) [8].

The regular application of probiotics may help to create the stable and balanced intestinal microflora that will improve the calf health (Soto et al. 2011).
Probiotics are viable microorganisms exerting a favorable effect on the host’s health by improving its intestinal microbial balance [10]. For pathogenic microorganisms probiotics are competitors in the utilization of intestinal space and nutrients, they reduce intestinal pH by the production of organic acids, release bacteriocins and hydrogen peroxide and stimulate the host’s immunity system. Probiotics may reduce the risk of infections and intestinal disorders [11]. To maintain the changeless and high level of probiotics in the digestive tract of calves, the administration of these products should be as long as possible [12].

Homeopathic products are based on plants, animals or minerals. A substance which in high doses has specific symptoms in healthy individuals, can cure the disease with similar symptoms in a sick individual. Through the homeopathic remedy strength is stimulated and responds and restores the balance of the patient. It is important that the environment, in which the patient lives, were in balance, and thereby helped to homeopathic treatment [13]. Homeopathic remedies can be administered in the form of drops, pills, granules, via the intravenous route or tablets soluble in the liquid [14]. Many homeopathic remedies are made from natural ingredients, are available in a variety of forms that are easy to use, and therefore they probably reach better compliance than conventional treatment [15].

2. Materials and methods

A total of 52 Holstein calves (13 in Lactobacillus sporogenes group, 13 in Ascophyllum nodosum group, 13 in Homeopathic group and 13 in control group) from one dairy cows herd were included in the experiment. After birth the calves were randomly divided into four treatment groups: group 1 Ascophyllum nodosum, group 2 Lactobacillus sporogenes, group 3 Homeopathic and control group 4. They were separated and weaned from mothers on the first day after birth. Calves were reared in individual littered hutches from the second day of life to weaning. They received colostrum and mothers milk ad libitum three times a day from a bucket with nipple from the second to fourth day. From the fifth day they received 4.5 kg of milk replacer per day divided into 3 portions. Colostrum and subsequently milk replacer were administered to calves in plastic buckets with nipples that were fitted in the hutches at a height of 40 cm above the ground. The calves had a free access to drinking water for the entire experimental period. The experiment was conducted from July 2014 to December 2014. The Ascophyllum nodosum experimental group received orally 5 ml of hydrolyzate from brown seaweeds in addition to colostrum and milk replacer. The Lactobacillus sporogenes experimental group received orally 1 tablet of probiotics added to colostrum at first and then to milk replacer and thoroughly mixed. The formulation of one tablet of probiotics was as follows 4×107 Lactobacillus sporogenes. The homeopathic group received 20 ml of homeopathy/head/day which were mixed in water and added at first to 2.5 liters of colostrum and later to milk replacer mixture. Experimental groups were administered these feed supplements one time a day (at the second feeding). Both supplements were applied to experimental groups within the first fortnight after birth. The control group received an unsupplemented diet, consisted 1.5 kg of milk replacer per feeding (totally 4.5 kg), starter mixture and alfalfa hay ad libitum. All calves were observed until the 28th day of life. All calves were weighed within two hours after birth. They were weighed regularly every week. The data were analyzed using a General Linear Model ANOVA (four ways with the interactions) of the statistical package STATISTICS 10 (Analytical Software, Tallahasee, FL, USA). In treatments groups these factors were evaluated: 1 –Ascophyllum nodosum, N=13, 2-Lactobacillus sporogenes, N=13; 3-Homeopathic group, N=13 and 4-control, N=13. Values are expressed as means±SD and differences were considered at P<0.05.

3. Results and discussion

The calves from the 1nd treatment group (Lactobacillus) reached the highest live body weight at the 28th day but differences were not significant in comparison with other groups (Table 1).
Table 1. The influence of applied supplements on the growth and morbidity of calves 28 days after birth

<table>
<thead>
<tr>
<th>Groups</th>
<th>N</th>
<th>BW day of birth</th>
<th>BW 28 days after birth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lactobacillus</td>
<td>52</td>
<td>29.00±3.37</td>
<td>41.00±2.82</td>
</tr>
<tr>
<td>Homeopathic</td>
<td>52</td>
<td>27.00±2.58</td>
<td>38.00±5.42</td>
</tr>
<tr>
<td>Ascophyllum</td>
<td>52</td>
<td>30.00±3.33</td>
<td>41.00±4.24</td>
</tr>
<tr>
<td>Control</td>
<td>52</td>
<td>28.00±3.37</td>
<td>38.00±4.01</td>
</tr>
</tbody>
</table>

SD=standard deviation; BW=body weight; N=number (1–Lactobacillus sporogenes, N=13; 2–Homeopathic, N=13; 3–Ascophyllum nodosum, N=13; and 4–Control, N=13)

At the present work we studied the impacts of three feed supplements. However, the highest effect was showed in 1st treatment group, which received Lactobacillus sporogenes. These calves had the most intensive growth of livebody weight. A positive influence of the use of Lactobacillus sporogenes on weight gains of calves was also reported by Soto et al. (2011) [9], Frizzo et al. (2010) [16], Fuller (1989) [17], Tarboush et al. (1996) [8], Schneider et al. (2004) [18], and Timmerman et al. (2005) [19]. A lower influence on an increase in weight gains of animals in the group with Ascophyllum nodosum may be a result of the availability of a sufficient amount of prebiotics in ordinary feed like oats, barley and wheat while the prebiotic availability is not a limiting factor [20]. There was an increase of live weight of calves in the Homeopathic group compared to the control group, but the result was not statistically significant. Positive impact of homeopathic remedies on the health status of calves confirms in his study also Kayne et al. (1994) [21].

4. Conclusions

By observation of the experimental groups Homeopathics, Ascophyllum nodosum and Lactobacillus sporogenes compared to the control group it can be concluded that the dietary supplements have a positive effect on the body and overall health of calves. We can state a disparity weight gain in experimental groups versus the control one. Nevertheless, the statistical results indicate that the weight gains in individual groups may be the same, but the feed additive may not always have significant effect on the organism of the calf.

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References

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