



World Scientific News

WSN 78 (2017) 9-13

EISSN 2392-2192

Effects of using specialized feed additives for dairy cows in the perinatal period

Daniel Radzikowski

Siedlce University of Natural Sciences and Humanities, Siedlce, Poland

E-mail address: daniel18-1994@wp.pl

ABSTRACT

Perinatal period is the most important time in the feeding of dairy cows, which affects all subsequent lactation. Very important in this period is the appropriate selection of feeds, ensuring the nutritional needs of cows. Because of the poor appetite of cows after calving, metabolic disorders often result from negative energy balance. In order to counteract this, it is necessary to administer specialized feed additives to cows for that period. This includes protein and protected fats, feed yeasts, propylene glycol, anionic salts and bolus. These preparations are designed to protect cows from falling feed intake and improve energy balance in the female body. They also increase milk yield and improve milk parameters. All this makes modern milk farms more and more used.

Keywords: protein protected, fat protected, yeast feed, propylene glycol, anionic salts, boluses

1. INTRODUCTION

For the last few years, we have witnessed the dynamic development of farms that produce milk. The performance of dairy cows resulting from improved nutrition and genetically engineered production is increasing year by year. Increasing the genetic potential of dairy cows, which makes it possible to achieve high milk yields, forces breeders to change their diets. Despite the availability of voluminous and rich feeds with high food values, it is not possible to compile a dose in a manner that guarantees full coverage of the high-performance cow diet. This is why it is inevitable that specialized feed additives will cost you,

but they will increase your cow's profit on the farm. Breeders are aware that they must use such products in dairy cows' diets, which will limit the occurrence of metabolic diseases, increase reproductive rates, and improve the performance and chemical composition of milk.

The highest importance is given to feeding during the dry season and 100 days after calving. The big disadvantage is that for nutritional reasons there are two diametrically different periods. During the drying period, cattle are spared energy and protein - it is designed not to allow too much cows, which can counter many metabolic diseases. The post-calving period is a problem with too little feed in relation to demand. This results in a negative energy balance, which starts about a week before childbirth. Therefore, it is very important to choose the right feed for the perinatal period, both at the end of the drying time and after calving. Very helpful at this time are feed additives, which are currently on the market more and more and will undoubtedly help maintain the proper condition, productivity and health of the animals in the perinatal period.

The purpose of my article is to provide specialized feed additives that are intended for the perinatal period, the effects and effects of feeding high performance dairy cows. The work was based on a review of domestic and foreign literature.

2. ADDITIVES FOR ADMINISTRATION IN THE PERINATAL PERIOD – CHARACTERISTICS AND EFFECTIVENESS OF USE

2. 1. Protein protected

Protected formulas include amino acids, protein and fat. These are substances whose use is profitable in high-performance dairy cows, which are at the top of lactation. The characteristic feature of these products is poor rumen distribution and very good decomposition in the small intestine. Protected protein (by pass), may be formed by the action of formalin, extrusion and xylose on soybean meal, rapeseed or sunflower meal. Production of feed additives also produces protected amino acids that cover lactating cows' demand for lysine and methionine. The ways to protect amino acids include: covering the fat with calcium, fat with protein or fat itself. The benefits of using protected protein preparations are primarily the increase in milk yield and the improvement of milk parameters, mainly protein (Socha et al 2005, 1113-1126). Thanks to the use of protected amino acids that modify the composition of amino acids absorbed in the small intestine, better digestion and feed utilization are obtained, the decrease in somatic cell counts in milk and the shortening of intercourse by improving the fertility of dairy cows (Xu et al., 1062-1077).

2. 2. Fat protected

Fats protected as feed additives for high performance dairy cows are often used because of the difficulty in covering the energy deficit of cows at the beginning of lactation. This results in a negative energy balance, leading to ketosis and high financial losses associated with it. The most protected fat is produced in the form of encapsulated calcium salts of fatty acids or hardened loose fats (Włodarczyk and Budvytis 2011, 771-776). Its characteristic feature is indifference to the fermentative distribution in the rumen, and good digestibility in the acidic environment, so that it is only distributed in the duodenum. May be used as a maximum of 3 - 3.5% in dry dose (600 - 700g per day). Control of dry matter intake by cows should be monitored, and buffered additives should be added with buffered fat as well.

According to Lohrenz et al. (2010) in addition to improving energy balance and milk yield (about 0.9 kg / day), the use of fat protected in dairy cows in the first phase of lactation results in a significant decrease in protein content in milk (0.1 % - 0.3%).

2. 3. Yeast feed

Feed fodder is included in feed additives, which favorably affect the functioning of the rumen of dairy cows. Yeast feeds contain single-cell fungi belonging to the *Saccharomyces cerevisiae* family or *Candida scontti*. The products available on the market include products containing both the protein, vitamins and micronutrients of the "dead" yeast, but also the "live" yeast, which additionally affects the development of microorganisms in the rumen.

Yeast has been used in the feed industry for a long time, and the benefits of using it are very well researched and described. First and foremost, they are a source of highly digested, high-quality protein, rich in amino acids such as lysine and threonine, and bio-nutrients and B vitamins. They also deliver high levels of metabolic energy to the body, with a high digestibility of 90%. The fodder yeast protein is also naturally protected from rumen degradation.

Yeasts have a beneficial effect on the bacterial flora of the gastrointestinal tract and on the growth and proper development and health of young animals (Krzyżewski 2014, 8-13). Used in cow feeding, they increase milk yield and milk fat content by stimulating the production of volatile fatty acids. They contribute to the prevention of metabolic diseases of cows and improve cows' reproduction rates. They also have a beneficial effect on the immunity of the body, by increasing the phagocytic capacity of white blood cells and on the functioning of the digestive tract. The addition of yeast stimulates the growth of the fungus living in the rumen, which improves the digestion of raw fiber. It has been found that the beneficial effect of yeast on the reactions and changes occurring in the rumen of cows is caused by the increase in rumen fluid pH, due to the use of lactic acid by bacteria. Also, providing with this addition of B vitamins, stabilizes the conditions under which fermentation takes place in the first part of the cow's stomach, and by the reduction of oxygen it results in increased anaerobic digestion of structural carbohydrates.

It is advisable to use feed yeast for cows in the final drying phase and at the beginning of lactation, due to the stimulation of proper amount of dry matter intake, when feeding high doses of solid feeds, thus counteracting the negative energy deficit in the body of the cow and the formation of rumen acidosis (Krzyżewski 2013, 14-17). The use of yeast in feeding dairy cows has a positive effect both on milk yield and its technological characteristics. In studies Czaplicka et al. (2014, 69-75), it was found that the addition of feed yeast to dairy cows resulted in an increase in FCM milk yield and a decrease in the number of somatic cells in milk.

2. 4. Propylene glycol

In cows after calving very often there is a shortage of energy, a decrease in blood glucose levels and the activation of fatty reserves, which leads to the initiation of the synthesis of harmful ketones (Włodarczyk and Budvytis 2011, 771-776). This implies the risk of ketosis in dairy cows in the first stage of lactation. This also leads to very large economic losses, whose effects are apparent in all subsequent lactating cows. There is a reduction in feed intake, a reduction in milk production, and a significant deterioration in female fertility.

In order to prevent this, high-energy feed additives should be used in the final drying phase and at the beginning of lactation. Glucose precursors to which propylene glycol belongs. Propylene glycol is a chemical compound called 1,2 propandiol, which breaks down in the liver into propionic acid and later into glucose, causing it to be easily absorbed by the body of dairy cows. The benefits of using this additive include Drop free fatty acids in the blood and provide easily absorbable glucose and increase its serum concentration. Propylene glycol should be used in the final drying phase for approx. 2 weeks before calving in the amount of 150 g / day, up to 3 weeks after calving, increasing the product to 300 g / day (Jeroch and Lipiec 2012, 354-357).

2. 5. Anionic salts

Anionic salts are chemical compounds used as feed additives in high-performance dairy cows in order to maintain a suitable cationic anionic balance in the final drying phase and at the beginning of lactation, thereby reducing the risk of diarrhea (Goff et al. 2004, 1245-1255) (Włodarczyk and Budvytis 2011, 771-776). Anionic salts are magnesium, calcium and ammonium sulphates and chlorides of the same metals, which are used in the amount of 100-150 g / day for 3 weeks before calving. The benefits of using anionic salts include the protection of the cow's body against diarrhea, the increase in dry matter intake, the reduction in postpartum swelling, the beneficial effect and the resistance and reproduction of cows, through the regulation of uterine inversion, which accelerates the onset of the first ovulation after calving By using anionic salts, the consumption of feed should be controlled, because the bitter taste of these additives may cause a decrease in dietary intake, resulting in rumenic acidosis in dairy cows in the first phase of lactation (Łopuszańska-Rusek and Bilik 2007, 55-66).

2. 6. Boluses

Bolus are concentrated forms of mineral-vitamin supplements and plant extracts, which are placed in the form of capsules in the rum or dairy cow cap. Their main task is to provide cows and heifers with substances necessary for the proper functioning of the organism at a certain stage of lactation and to protect animals against diseases caused by mineral deficiencies. The duration of bolus action can vary greatly, as there are both decaying capsules and those that are active for more than half a year. Bolus are most often used for reproductive problems, resulting from deficiencies, prophylaxis against mastitis and perinatal diseases. There are also bolus markets that reduce the amount of somatic cells and also protect the body against subclinical ruminal acidosis (Wilczek-Jagiełło 2013, 65-67).

3. CONCLUSIONS

Perinatal period is a time that undoubtedly affects all subsequent lactating cows. Not proper nutrition at this time, affects the productivity, fertility and health of the whole herd. Failure to provide adequate amounts of nutrients and minerals can lead to premature failure of animals. In order to prevent this, feed additives that provide easily and quickly absorbed protein, energy, vitamins and minerals sources should be used to ensure high stocking capacity while maintaining adequate herd health.

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(Received 14 June 2017; accepted 05 July 2017)