

Biotechnology helps to utilise fibre for dairy cows

Dairy farmers all over the world are pushing the biological limits of their cows in order to maximise profit and ensure the livelihood of their family and employees. Unfortunately, milk prices are not always following the inflation of expenses (feed and energy costs), and in the last 10-15 years it has fluctuated between €0.25-0.4/l. This leaves us with the urge to improve milk yield.

by Daniel Molnar, Dr Bata Ltd.
www.dr бата.com

As we are slowly reaching the genetic limits of milk production and the nutritional values of the feed components, we have to search for new opportunities to improve the energy supply of our cows.

A possible solution is to improve the utilisation of the daily ratio for our cows. Ruminants have to rely on their rumen microbiota in order to utilise the indigestible feed components. Rumen fermentation is extremely effective in the digestion of cattle forage; however, the hemicellulose part of the given feed is not utilised completely by the rumen micro-organisms and thus is lost as an energy source for the cow.

With the application of hemicellulose degrading enzymes, the hemicellulose degradation can be enhanced and, as a result, more energy can be utilised from the feed, which is manifested in higher milk

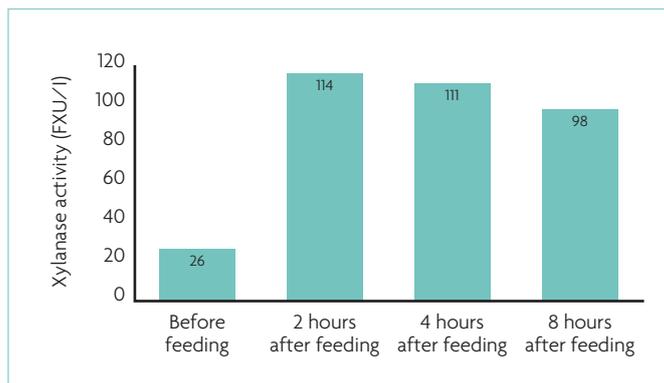


Fig. 1. Xylanase activity of the rumen fluid before and after Rumino-Zyme.

production and better milk parameters. The best way to supply these enzymes is in a rumen stable way. Rumen stable extracellular enzymes are much more effective than conventional enzymes, as they provide a long-lasting balanced effect.

Rumino-Zyme consists of enzymes with high enzyme activity such as xylanases, glucanases that not only enhance hemicellulose digestion in the rumen but also promotes the rumen microbiota and stabilises the rumen pH.

Dr Bata Ltd conducted many in vitro trials at their research centre using an advanced rumen simulation technique, in order to prove the effectivity of Rumino-Zyme. During these trials we tested the xylanase activity of their product.

In Fig. 1 we can see, that the

xylanase activity of the rumen increased four-fold compared to the period before enzyme supplementation. We can also see that the rumen stable enzyme also had a much longer activity, that only decreased slowly.

As mentioned previously, Rumino-Zyme can also contribute to the stabilisation of the rumen flora and pH. The degradation of hemicellulose to monomers by the enzyme, supplies the rumen microbiome with sugars and contributes to an ideal flora composition and to maintain the pH optimum of 6.3-6.7.

These bacteria on the other hand produce volatile fatty acids that influence the rumen pH but also serve as an energy source for the cow. In Fig. 2 we can see how Rumino-Zyme helps to keep the

rumen pH at its optimum. Besides in vitro studies Dr Bata Ltd also evaluated the efficiency of this unique fermentation product on many farms internationally in the past years. One of the recent studies done at their research farm showed impressive returns on investment.

For the trial, 200 second and third lactation Holstein Friesian dairy cows were selected randomly to control and experimental groups of 100. The daily feed of the control cows consisted of corn silage, alfalfa, meadow hay and concentrate. Composition of the daily feed of the experimental cows was the same except 20g of Rumino-Zyme cow/day was added. Milk production increased in the first four months of lactation by 8-10% (Fig. 3).

The significant milk performance improvement resulted in an average plus of four litres milk/day (€1.4) and in a return of investment of 8.8:1 based on a milk price of €0.35/kg.

A simple tool with high potential

As it is really hard to meet the nutritional needs of high lactating cows it is essential to exploit our reserves. Rumino-Zyme not only improves the digestibility of feed but also ensures a balanced rumen flora and contributes to a healthy and well producing stock.

Furthermore, it rewards the farmer with an estimated €350/cow extra profit a year. ■

Fig. 2. Effect of Rumino-Zyme on rumen pH, compared to normal pH after feeding.

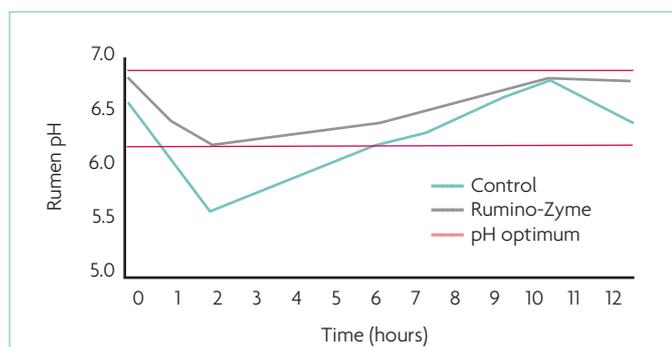


Fig. 3. Average milk production in the control (cow-house 5) and the experimental group (cow-house 12) in the peak period of lactation.

