Newsletter

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> EDITORIAL

Yeasts are probably among the earliest domesticated organisms. Throughout history people have used yeasts for fermentation and baking. The most important and best known strain in feed and food science is undoubtedly Saccharomyces cerevisiae.
Different yeast products are fed to animals including yeast-fermented mash produced directly on the farm, yeast by-products from breweries and distilleries, or yeast products commercially produced for animal feeding. The beneficial effects of yeasts in the dairy industry are well-known and have been utilized for more than a century. They are considered capable of improving rumen microbial activity, feed utilization and cow performance. However, their in vitro and in vivo mode of action, with respect to improving animal performance, is still not completely understood.
Together with world-wide research institutes, BIOMIN's R&D has resulted in a very unique and specific yeast derivative -Levabon Rumen- which improves the health and metabolism of ruminant animals.
Thus, the Competence Center Yeast (CCY) is now ready to provide an innovative, natural, yeast-based product which improves feed utilization and, in turn, helps maintain and/or improve ruminant performance.
This newsletter will introduce you to the benefits of our autolysed yeast product, Levabon® Rumen, followed by an overview of different yeast derivative products for ruminants on the market, their mode of action, benefits, differences, advantages and disadvantages. Furthermore, an in vitro comparison with RUSITEC elucidates the efficacy of commercially available competitor yeast products compared to Levabon® Rumen.

Anja Ganner

Levabon® product line

The term autolysis or "self-digestion" refers to the disruption of a cell due to activation of its own enzymes. A standardized autolytic degradation of the yeast cell content provides functional components such as ribonucleic acid (RNA), nucleotides, cell wall carbohydrates (mannan, glucan), peptides and amino acids in a pre-digested form. Those bioactive components serve as nutritional sources for beneficial anaerobic rumen microbes such as cellulolytic, lactate utilizing and amylolytic bacteria. Increased numbers of beneficial rumen microbes lead to a better rumen environment and improved digestibility of the ration and especially the crude fiber. The result is an increased feed intake, higher energy and nutrient availability and, therefore, improved animal health and performance.

Autolysed yeast for ruminants

Live yeast versus autolysed yeast

Different categories of yeast products for ruminants are available on the market.

- Hydrolysed yeast (enzymatically cleaved cell content) or autolysed yeast
- Live yeast
- Yeast culture: deactivated yeast including fermentation broth blended with cereals
- Inactivated, dry yeast: highly digestible protein and Vitamin B source

As explained in a previous paragraph, the mode of action in autolysed yeast, hydrolysed yeast or yeast culture is a prebiotic effect: bioactive ingredients (e.g. cell wall carbohydrates, peptides, metabolites) are directly available, as feed, for beneficial rumen bacteria. In contrast, the mode of action in live yeast is explained through oxygen consumption and bioactive substances; live yeast uses oxygen in the rumen environment, thereby providing a better environment for growth of the strictly anaerobic bacteria (e.g. cellulolytic bacteria).

Specialized production process for increased efficacy are the main sales arguments from yeast companies. Hydrolysis uses enzymes for degradation of yeast cell content, whereas metabolite yeast is produced with an aerobic/anaerobic process which accumulates the respective metabolites (peptides, amino acids, vitamins, nucleotides etc….).

Advantage of autolysed yeast compared to live yeast:

- Product consistency: Levabon® Rumen is a consistent product which doesn´t change during shipment, pelleting, pre-mixing, blending with minerals or high temperature storage and doesn't 'die' in the rumen. In contrast, live yeasts are very sensitive regarding these actions.
- The dosage of live yeast products (0.5-4 g/cow/day) is 10fold less than the dosage of prebiotic yeast (10-60 g/cow/day). Small inclusion rate of live yeast leads to less homogeneity in the ratio.

In vitro comparison with RUSITEC

Efficacy of Levabon® Rumen versus yeast culture and live yeast on digestibility in a RUSITEC system, University of Veterinary Medicine Vienna, Austria.

Aim of the trial

The aim of the present study was to evaluate how supplementation of a novel yeast derivative (Levabon® Rumen) affects digestibility *in vitro* versus commercially available yeast culture and live yeast.

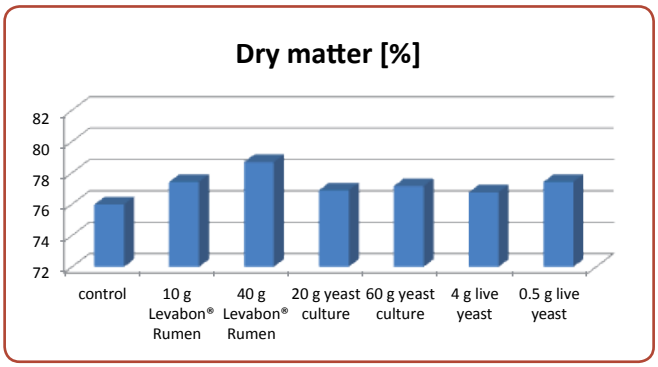
Trial design

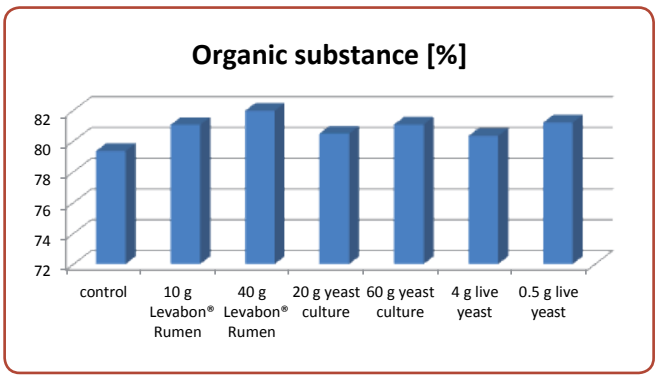
In a long-term incubation experiment with the rumen simulation technique (RUSITEC), different levels of the respective yeast products were fed daily under a constant flow of artificial saliva over a period of 14 days. The samples were mixed into a ration consisting of 50% hay and 50% concentrate, sealed in nylon bags (pore size 150 µm) and incubated in fermenters containing rumen

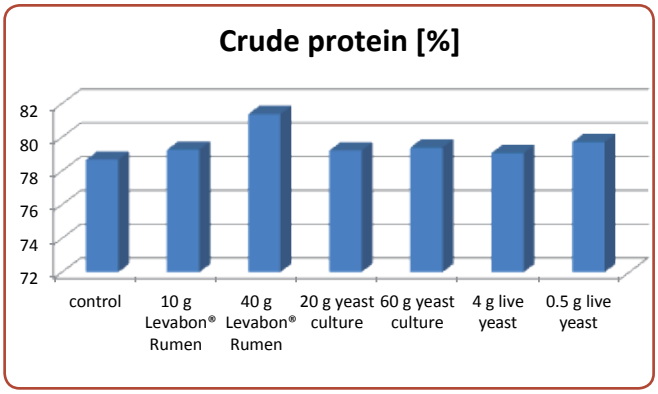
liquid from rumen-fistulated dairy cows. After a 7- day adaptation-phase samples were collected over 7 days. The nutrient digestibility (including dry matter, organic substance, crude protein, crude fiber and energy) was determined before and after incubation using Weender analysis.

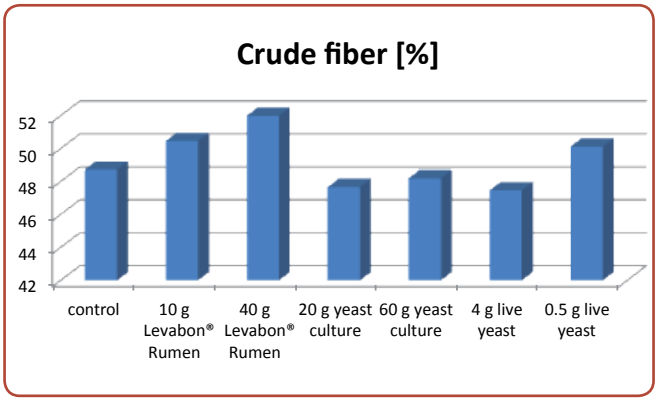
Results and Discussion

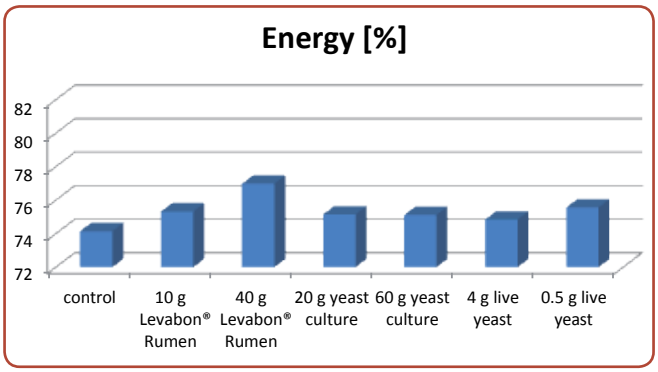
Levabon® Rumen shows consistently improved digestibility *in vitro* with the recommended dosage for field application (10g/cow/day). Repeatedly, our autolyzed yeast product Levabon® Rumen shows improved digestibility (dry matter, crude protein, crude fiber, organic substance, energy) compared to the control- and commercially available yeast products, such as yeast culture and live yeast.











Conclusion

Levabon® Rumen is an innovative, unique yeast derivative (autolysed yeast) which improves nutrient digestibility *in vitro* (RUSITEC). Thus, Levabon® Rumen represents an excellent feed additive to improve ruminant performance.

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