

Transition management in the dairy cow with the help of live yeast

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Transition is a critical period with metabolic and hormonal changes for the cow, as it converts from a non-lactating to a lactating state and undergoes the stress of parturition. Moreover, certain transition management practices such as pen moves and diet changes bring additional sources of stress.

Cows often fail to adapt to these changes, resulting in 75% disease incidence during the first month after calving and substantial economic losses to the dairy industry.

This is why transition should be seen as the cornerstone of the cow's cycle: while it represents a major challenge for the cow's health and performance, it also represents the basis for optimal lactation, good health and reproduction. Transition management is the key to herd profitability!

Research shows that transition also represents a major challenge for the rumen, an effect which can contribute to energy imbalance. Hence, strategies aiming to improve environment and function of the rumen are essential to successful transition feeding programs.

Among proven rumen modifier solutions, live yeast strain *Saccharomyces cerevisiae* CNCM I-1077 (Levucell SC, Lallemand Animal Nutrition) has been extensively documented to improve dairy rumen pH and feed efficiency.

The potential of this specific live yeast as a nutritional tool for transition management is supported by several production trials. They showed its efficacy to:

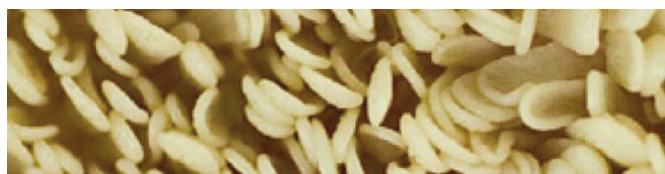
- Enhance feed efficiency and milk production.
- Help reduce body weight loss in early lactation.
- Optimise the general well being of fresh cows.

The most recent trial, conducted in Spain under the supervision of IRTA (Spanish Institute for Research and Technology in Food and

Agriculture), confirms this potential and the profitability of Levucell SC for transition management.

Transition: a critical phase

Transition is characterised by a negative energy balance as the cow nutritional requirements rise while there is a drop in feed intake. This eventually leads to metabolic disorders such as ketosis, but also to loss of productivity and body condition, which in turn will affect long term health, reproduction and longevity.



Evaluation of body weight loss or assessment of body condition score during the first months of lactation is crucial for dairy farmers and nutritionists to manage a successful start in lactation. Research on the impact of transition on the cow's rumen balance and function is less documented.

During transition, the cow typically moves from a dry cow fibrous diet to a more energetic, starch-rich diet around calving, to compensate for the negative energy balance.

These changes represent a major stress for the rumen microbiota, whose activity may be strongly altered. In particular:

- Decreased fibrolytic bacteria populations.
- Increased amylolytic bacteria, such as lactate producer *Streptococcus* bovis.
- Decreased rumen fungi populations (important role in fibre digestion).

Rumen pH decreases post-calving, leading to a high risk of acidosis and acidosis-related health problems. Finally, rumen papillae surface area decreases during the dry period. Absorption of energy and nutrients, as well as acids clearance in the rumen, are linked to the surface area of rumen papillae. This area is determined by both papillae length and density. In dry cow, the length and density of rumen papillae can be decreased by as much as 50%, and recovers slowly post-calving.

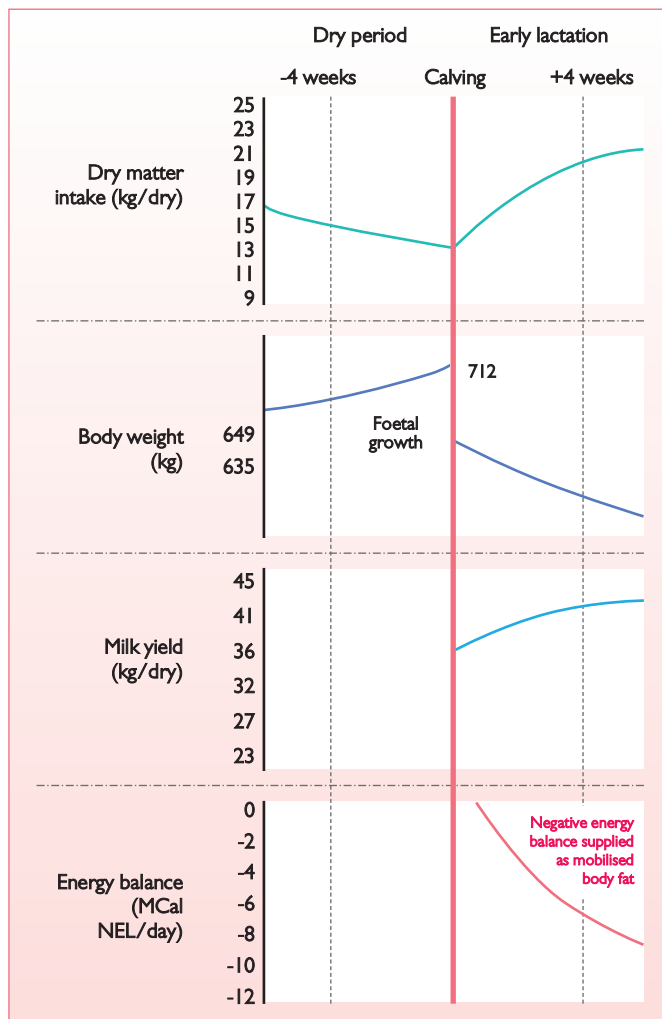
Nutrition management during transition is important to maximise diet digestibility and the rumen wall exchange area. Ultimately, impaired rumen function can contribute to lower feed efficiency and health performances of the dairy cow.

Live yeast

Saccharomyces cerevisiae CNCM I-1077 is a unique yeast strain specifically selected and extensively documented for its beneficial effects in the rumen. Today, with more than 60 scientific publications, its mode of action in the rumen is more and more understood. Analysis of 14 different trials conducted in dairy cows demonstrates the beneficial

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Fig. 1. The critical transition period.



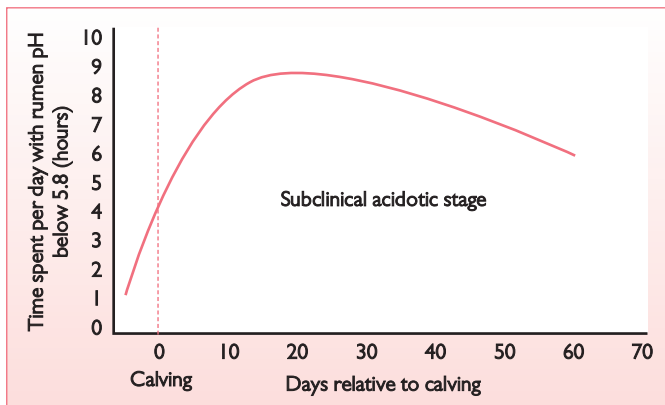


Fig. 2. Effect of day relative to parturition on time spent under rumen acidosis condition daily.

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effect of CNCM I-1077 on feed efficiency (+50g of fact corrected milk/kg dry matter intake)

The potential of *S. cerevisiae* CNCM I-1077 as a nutritional tool for transition management is supported by several production trials, in particular its ability to improve milk yield and reduce body weight loss in transition, due to:

- An optimised rumen pH.
- An increased fibre degradation.

More recently, a trial was conducted in La Travesia Commercial dairy farm, in Navarra, Spain, under the supervision of the Department of Ruminant Production of IRTA, on 40 high producing dairy cows (20

control + 20 supplemented). In this study, *S. cerevisiae* CNCM I-1077 reduced body weight loss and increased milk production (milk yield and milk solids):

- At the end of the transition period (one month post calving), the dairy cows supplemented with *S. cerevisiae* CNCM I-1077 were on average heavier by 9.7kg as compared to the control ($P < 0.001$), equivalent to 0.32kg/day.
- On average, cows fed with *S. cerevisiae* CNCM I-1077 produced 1.0kg extra of energy corrected milk per day (+2.5%). Moreover, this trial showed some benefits on digestive microbial balance and animal behaviour.

Fig. 4. Effect of *S. cerevisiae* CNCM I-1077 on dairy production in transition (IRTA, 2012).

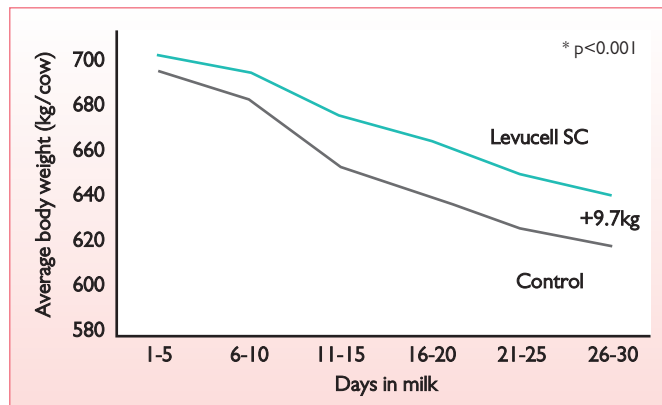
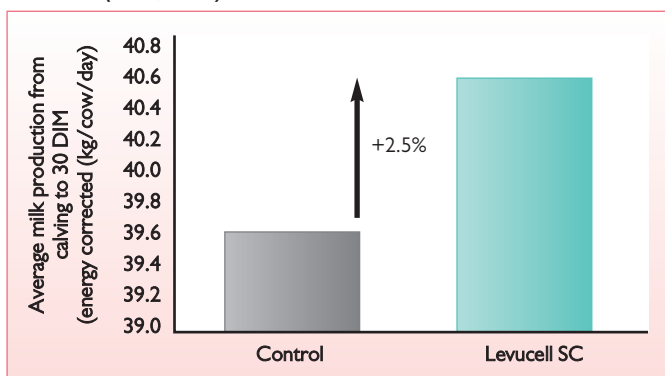


Fig. 3. The effect of *S. cerevisiae* CNCM I-1077 on body weight in transition (IRTA, 2012).

- Analysis of faecal microbial indicates that *S. cerevisiae* CNCM I-1077 contributes to stabilise gut microflora during transition, reducing the undesired bacteria populations (*E. coli*, Gram negative bacteria and coliforms). Higher pressure of friendly bacteria may impact in a positive way the level of somatic cells, mastitis and, potentially, cheese processing.
- Cow's resting behaviour is a sign of general well being and could be linked to digestive comfort: longer lying time leads to improved blood flow to the mammary gland, rumen motility, and reduces risk of lameness. Cows fed *S. cerevisiae* CNCM I-1077 spent numerically a greater time lying down than cows in the

control group. Previous international trials confirmed those benefits on animal performance and demonstrated potential interest for DM intake recovery and fertility improvement.

Conclusion

To summarise, financial benefits from the supplementation of CNCM I 1077 are not limited to milk increase in the tank: the effect on body weight is adding value thanks to an indirect effect on fertility (demonstrated in a previous study) and through the fine-tuned optimisation of future feeding programs including Levucell SC. ■

The expert's view

"Feed efficiency should not be considered as a unique criterion, especially for the transition cow. Body weight gain is to be added into the equation, as it has important consequences on reproductive performance and longevity. This is even more critical for primiparous cows with limited intake capacity, which are thus more dependent on their own body reserves. In the study conducted at the Department of Ruminant Production of IRTA, live yeast Levucell SC shows encouraging results, especially on primiparous cows with a significant lower body weight loss and a positive trend on milk yield."

Dr Alex Bach, Department of Ruminant Production of IRTA; Research professor of ICREA, Cataluña Spain