

Effect of glucose precursors on dairy milk production during the transition period

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Due to the genetic productive potential, glucose precursors are needed in the energy metabolism of transition dairy cows.

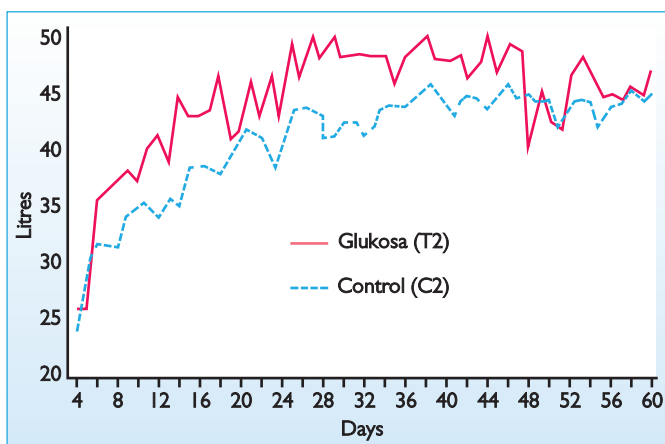
The inclusion of Glukosa from Novation at 300g per dairy cow per day on TMR, increases milk production by more than 200 litres in the first 60 lactation days and reduces the nonesterified fatty acid (NEFA) blood levels significantly. All this with an average cost/benefit return of 230%.

Some metabolic disorders, health problems and weight loss are common during the transition period, and can affect the productive performance of dairy cows in the long term. These occur at the beginning of the lactating period when a negative energy balance (NEB) is produced, because the energy needs are not covered by the reduced intake capacity. When a >0.5 points drop of body condition occurs, the NEB negatively affects milk production and reproductive activity.

In case of accentuated NEB, the NEFA converts to ketonic bodies in the liver, as β -hydroxybutyrate (BHB), which accumulates in large quantities and causes ketosis and fatty liver.

To determine the NEB in cows the fat mobilisation is measured with the NEFA values (optimum ≤ 0.4 meq/L).

Fig. 1. Milk production (kg/day) in the second lactation period.



litre at 21 days pre-partum) and the ketonic bodies by means of β -hydroxybutyrate (BHB) (optimum ≤ 1.2 mmol/L in lactation).

Glukosa is a powder glucose precursor. It is easy to manage for feed or TMR application. Each ingredient is essential to prevent NEB in high production dairy cows.

The ratio of propylene-glycol/glycerol plays a very important role in the lactate and propionate metabolic regulation, and the vitamins and minerals included improve the efficiency in the propionate to glucose transformation, reducing the BHB and NEFA levels.

Trial results obtained by the Veterinarian School of Santo Tomas University, Chile, in April 2011, show the inclusion effect of 300g/cow per day of Glukosa in 30 high production cows of second and \geq third lactation during the transition period of second and \geq third lactation.

Milk production was measured up to 60 lactating days and blood NEFA levels at calving and BHB at 7, 14 and 21 days post-partum.

The total milk production of the Glukosa group during the 60 days lactation was 9.5% higher than the control (2448 vs 2236 litres).

Differences in second lactation cows occurred at the beginning and during the peak of lactation. In \geq third lactation cows, differences were seen mainly in the beginning of the lactation curve.

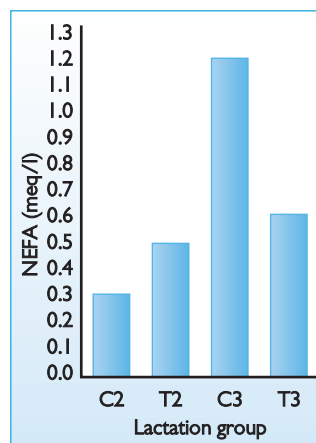


Fig. 3. NEFA serum levels at calving (meq/L).

As far as milk production goes, the inclusion effect of Glukosa was seen from the second lactation week up to the peak of lactation, especially from the third lactation.

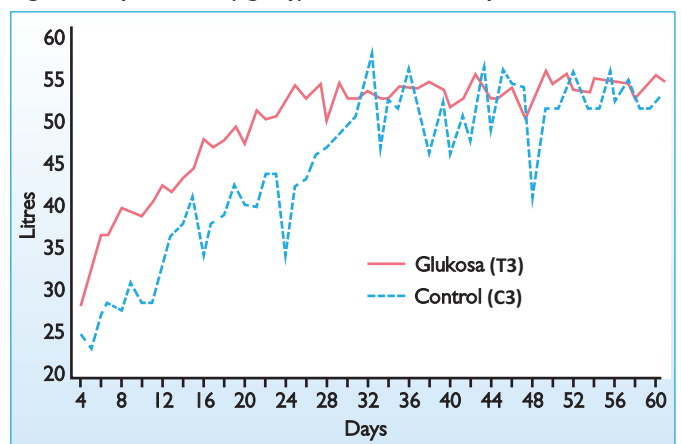
A significant effect was observed on the reduction of NEFA levels at calving in animals of \geq third lactation fed with Glukosa (0.6 vs 1.2 meq/L).

There were no differences in the second lactation cows, keeping optimal levels (≤ 0.4 meq/L).

Glukosa restrained fat mobilisation and NEFA production, resulting in a lower reduction of body condition and an increase of blood glucose.

Differences were observed in the BHB levels between the Glukosa and the control groups of second

Fig. 2. Milk production (kg/day) in \geq third lactation period.



lactation cows at 14 days post-partum. The Glukosa group showed a higher level of BHB (1.02 vs 0.58 mmol/L).

This effect is partially due to a more pronounced NEB for a higher milk production in the beginning of lactating peak (14 days).

At seven and 21 days post-partum, BHB levels were still within the normal limits (2 mmol/L) for all groups.

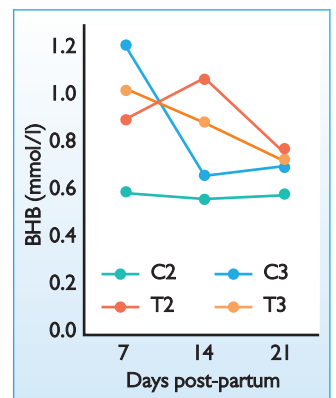


Fig. 4. BHB level at 7, 14 and 21 days post-partum.

The inclusion of Glukosa at 300g/cow per day on TMR, increases milk production and reduces the NEFA blood levels significantly in dairy cows. The inclusion of Glukosa in transition cows for 60 days of lactation produces a cost/benefit return of 224-238% for a range of milk prices of €0.31-0.33 per litre. ■