

SELEKT®

- Faster recuperation from ketosis in dairy cows
- Reduction in the risk of ketosis in dairy cows

GLYCEROL PLUS



Ketosis: A common disease of economic importance

More than one-fifth of dairy cows have elevated serum β -HB concentration (> 1.2 mmol/l) in the first 30 days after calving¹.

An elevated serum β -HB concentration is not the only change occurring in cows with excess fat mobilization. Hypoglycaemia and elevated serum free fatty acid (FFA) concentrations are also observed. These changes do not always happen together. Approximately 15% of cows have elevated FFA* without hyperketonaemia².

Therefore, analysing blood or serum β -HB concentration may lead to an underestimation of the prevalence of the disease.

Ketosis has been shown to have substantial economic impact on dairy enterprises^{1,3}. In a large study, the average cost of ketosis was found to be £230.84 per hyperketonaemic cow^{3**}.

The financial losses arise from direct and indirect costs (Table 1)¹. However, as most cases are sub-clinical, these losses often go unnoticed.

Direct Costs	Indirect Costs
Diagnostics	Future milk losses
Therapeutics	Increased culling risk
Discarded milk	Reproductive losses (empty days & reduced fertility)
Vet fees	
Labour/staff costs	
Deaths	

Table 1 - Sources of direct and indirect costs arising from ketosis¹

Two sources of energy: better than propylene glycol alone for ketosis recuperation

SELEKT® Glycerol Plus has been formulated to provide two sources of energy:

- *Propylene glycol* - a commonly used source of energy. It can be given only in small quantities, because of its toxicity, which commonly appears at 500 g/day.
- *Glycerol* - has a calorific value similar to that of propylene glycol. It is much safer and can be given in larger quantities.

These two energy sources allow for the utilization of two different glucogenic pathways. Propylene glycol must be converted to pyruvate before it enters the citric-acid cycle, where it is converted to glucose (Figure 1). Glycerol bypasses the citric-acid cycle, so it yields glucose more quickly. Giving them in combination provides an extended elevation of blood glucose concentration⁵.

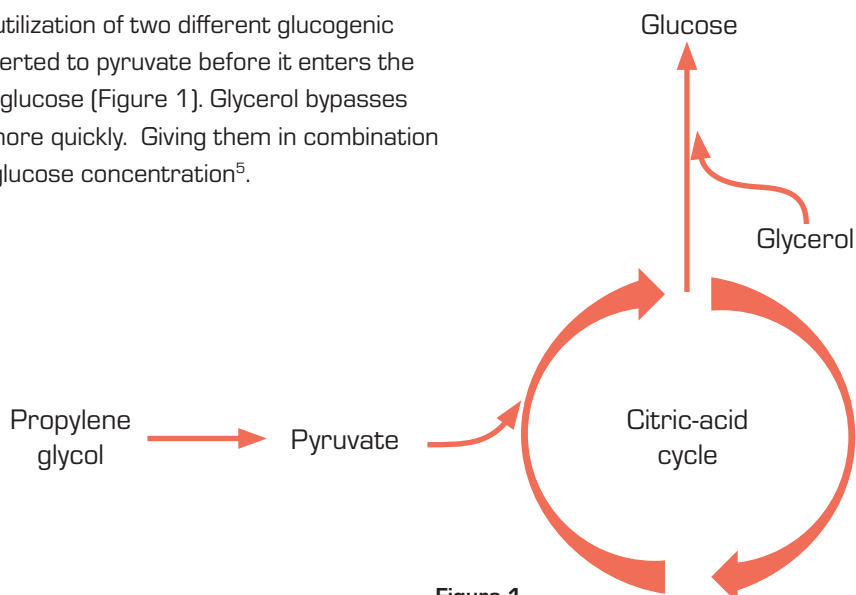


Figure 1

* Free fatty acids are synonymous with non-esterified fatty acids (NEFA)

** Originally reported in USD (\$289 USD)

Fewer drenches, less work

Propylene glycol can be given only in small quantities, because larger ones are toxic⁴. This means it must be drenched repeatedly to achieve good results. McArt *et al.*, (2011) found that 80 % of sub-clinically ketotic cows required nine doses of propylene glycol to restore them to normal blood β -HB concentration⁶.

In contrast, Wood (2014)⁷ found in cows with clinical ketosis the median number of drenches of SELEKT® Glycerol Plus required to return serum β -HB to its normal range was two for primary ketosis, or three for secondary ketosis. Clinical signs abate after one drench. But because excess fat mobilization is a risk factor for other diseases and reduces fertility^{2,3}, giving one or two further drenches may be justified.

Hydrolysed yeast benefits the rumen flora and increases propionate production

Yeast stimulates the growth of lactate-utilizing and cellulolytic bacteria in the rumen (*M. elsdenii* and *S. ruminatum*).

SELEKT Glycerol Plus contains a hydrolysed yeast. To produce a hydrolysed yeast, *S. cerevisiae* (brewer's yeast) is heat-inactivated and hydrolysed by specifically selected enzymes. The proteins are broken into smaller peptides and vitamins are released from the cytoplasm. This makes them more readily available to the rumen flora.

In a dry yeast, many of the beneficial proteins, nucleic acids, and vitamins remain locked in the cytoplasm and are not as readily bioavailable.

Hydrolysed yeast increases the microbial biomass in the rumen. In grass silage inoculated with rumen fluid a hydrolysed yeast increased microbial biomass by 300 x10⁶ cells/ml compared with rumen fluid alone⁸.

Hydrolysed yeast stimulates the production of short-chain fatty acids. This increases the production of propionate by 20%⁸. This is useful for the hypoglycaemic animal, as propionate is rapidly converted to glucose in the liver.

Hydrolysing yeast makes its cell-wall components more readily available. β -1,3- and β -1,6-glucans from the cell wall act as immunostimulants, antimicrobials and anti-inflammatories⁹. Inflammation plays an important role in the development of ketosis through increasing insulin-resistance.

Correcting dehydration

Many ketotic cows will be dehydrated. Ketosis causes dehydration in two ways. Ketones act as osmotic diuretics in the renal tubules. And elevated plasma cortisol concentration suppresses anti-diuretic hormone, leading to diuresis.

We recommend pump-drenching with a solution of SELEKT Restore mixed with SELEKT Glycerol Plus.



References

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- ⁶McArt, J.A.A. *et al.* (2011) 'A field trial on the effect of propylene glycol on milk yield and resolution of ketosis in fresh cows diagnosed with subclinical ketosis', *Journal of Dairy Science*, **94**(12), pp. 6011–6020. doi:10.3168/jds.2011-4463.
- ⁷Wood S. (2014) 'Outcome of treatment of clinical ketosis with an oral drench containing glycerol and propylene glycol', *Cattle Practice*, **22**, p.140
- ⁸Kettunen, H. *et al.* (2016) 'Yeast hydrolysate product enhances ruminal fermentation *in vitro*', *Journal of Applied Animal Nutrition*, **4**(1). doi:10.1017/jan.2015.14.
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Data Sheet

SELEKT® Glycerol Plus

Presentation	A cloudy liquid with a sediment, each kilogramme of which contains the following ingredients. Glycerol Ph. Eur.630 ml Propane-1,2-diol, U.S.P.320 ml Brewer's yeast whole-cell hydrolysate 46 g Excipients 4 g
Uses	For reduction in the risk of ketosis in dairy cows and twin-lamb disease in ewes. Also for ketosis recuperation. Provides glucogenic energy sources.
Instructions for feeding	For cows, mix contents with 10 ltr warm water; deliver into the rumen with a SELEKT Pump-drencher. For ewes and goats, deliver 2 ltr of mixture into the rumen with a SELEKT Mini-drencher 2 x daily until recuperation is complete. May be mixed with other SELEKT formulae made up as recommended, without additional water. Shake bottle well before pouring. Add warm water to the emptied bottle and shake vigorously, to release any remaining yeast. To be used in accordance with veterinary advice.
Contra-indications and warnings	Do not exceed the recommended amounts to be fed. SELEKT Glycerol Plus is to be used in accordance with veterinary advice.
Legal category	Dietetic feeding stuff
Package quantity	Box containing 6 x 1 litre
Marketed by	 Nimrod Veterinary Products Ltd 2 Wychwood Court Cotswold Business Village Moreton-in-Marsh Gloucestershire GL56 0JQ United Kingdom Tel +44 1608 652593 Email nimrod@nimrodvet.co.uk www.nimrodvet.co.uk



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Feed safety and
quality assurance

