

1 **Effects of different dosages of propylene glycol in dry cows and cows in early lactation**

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SUMMARY

In this Research Paper we hypothesized that the temporary insulin resistance seen during the transition period in dairy cows may cause significant differences in the efficacy of PG at different sampling periods and that in some cases this effect will be dose dependent.

Eighty four sampling sets were generated by studying 7 multiparous Holstein cows repeatedly at 4 sampling periods of 3 days length (dry cows: days 40, 39 and 38 *antepartum*; close up cows: days 10, 9 and 8 *antepartum*; fresh cows: days 3, 4 and 5 *post-partum*; lactating cows: days 38, 39 and 40 *post-partum*). On each of these days three hours after morning feeding propylene glycol was drenched in different dosages of 100, 300 or 500 ml once per day (cross over study). The different doses were applied in an alternating order (Latin square). Blood samples were taken before, every 30 min up to four hours, after six hours and twelve hours after PG application. Following parameters have been measured: insulin, non-esterified fatty acids (NEFA), betahydroxybutyrate (BHB), bilirubin, cholesterol, potassium, aspartate aminotransferase (AST) and glutamate dehydrogenase (GLDH). Revised Quantitative Insulin Sensitivity Check Index (RQUICKI) was calculated.

It was found that glucose, insulin, NEFA, BHB, bilirubin and potassium concentrations were influenced differently by the three defined dosages of propylene glycol at four different sampling periods. Whereas RQUICKI, cholesterol, AST and GLDH did not differ between the sampling periods and treatments.

The major results of the study are that the effect of PG is dose-dependent and that the effect of PG is depending on the time of application according to calving. It can be concluded that in fresh cows higher dosages are necessary to provoke similar effects in comparison to dry, close up and lactating cows. Further the bolus application of PG is necessary to provoke the effect.