Evaluation of glycemic carbohydrate formulations for assessment of insulin dysregulation in equines

Tobias Warnken
Clinic for Horses, University of Veterinary Medicine Hannover Foundation, Bünteweg 9, 30559 Hannover, Germany

tobias.warnken@tiho-hannover.de

T. Warnken, C. Schaub, J. Delarocque, F. Frers, D. Reiche, K. Feige, J. Sonntag

Introduction
Oral glycemic challenge tests are recommended for diagnosis of insulin dysregulation in equines. Several different protocols are used, but all of them have limitations in terms of palatability, ease of use in the field, not fully disclosed composition and/or region specific availability. The aim of the study was to evaluate new carbohydrate formulations (syrup, granulate and pellets).

Materials and Methods
All glycemic challenges in this study were administered with equivalent amounts of 0.5g glycemic carbohydrates per kg body weight. Firstly, the palatability was assessed in a mixed horse population (n=18). When trough-fed, a complete and fast voluntary uptake is necessary for use as accurate challenge. Secondly, feeding the pellet formulation, oral application of the syrup and standard oral glucose test (glucose dissolved in water via naso-gastric-tube, OGT) were performed in 18 Icelandic horses of different sex, age, bodyweight and metabolic status. Blood samples were collected for 4h and analyzed for insulin (Mercodia ELISA) and glucose.

Results
(1) Palatability - of the tested variants (new carbohydrate formulations and in-feed glucose), only the pellet formulation was completely taken up by all horses within 5±2 minutes. The syrup was well accepted when administered via a syringe orally. (2) The insulin concentrations and dynamics correlated significantly between the OGT and pellets (e.g. 120 min – r^2 0.82) or syrup (e.g. 120 min – r^2 0.96).

Conclusion
The new pelleted or syrup glycemic carbohydrate formulation can be employed as palatable/well-accepted, accurate, oral glycemic challenge test for assessment of insulin dysregulation in equines.