

## **Development and Validation of KetoQuant – A novel bovine milk-based ketosis test kit**

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Ketosis is a common metabolic disorder of dairy cows that occurs mainly due to negative energy balance. The prevalence of ketosis is very high in the early lactation period and it occurs even in best-managed farms. In order to have constant monitoring to manage the condition, a low-cost cow-side test is needed. Such a diagnostic kit, KetoQuant that detects  $\beta$ -hydroxybutyrate (BHB) in milk was developed and its diagnostic sensitivity and specificity was estimated in comparison with the commercially available Porta BHB milk strip test (Portacheck, USA). Out of 702 samples screened, seventy-two (10.26 %) were positive in both KetoQuant and PortaBHB kit, using 0.5 mmol of BHB as cut-off. The positive samples were also confirmed clinically as ketosis. The diagnostic sensitivity and specificity was estimated to be 98.6% and 99.4% respectively. Further, quantitative analysis of the results of both assays correlated well with an  $r^2$  value of 0.977. Thus the developed KetoQuant kit is proven to be an affordable cow-side test for BHB detection in milk samples for routine monitoring of ketosis in cows.