Effect of duration and temperature during the delivery of urine samples to the analytical laboratory on metabolic parameters assays

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Association Of Virginiamicyn And Monensin Mitigates The Rumen Lactic Acidosis Effects In Cattle

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Objectives: Rumen lactic acidosis (RLA) is a common disease in feedlot cattle. For prevention of this illness some dietary ionophores and antibiotics are used, mainly monensin (M) and virginiamycin (V). This experiment was carried out to check, by the first time, the effects of preventive use of dietary V + M on an experimental RLA in cattle.

Materials and Methods: An Official Brazilian Animal Ethics Commission approved this protocol, previously. Twelve yearling Nellore heifers were rumen cannulated and fed for one month with a 75% roughage and 25% concentrate diet according to their 2.5% body weight. Six heifers received daily 250 mg V and 300 mg M (V+M) in the diet and the same number kept as a control (C). An experimental RLA was induced in all animals by infusion of different amount of sucrose, into the rumen cannula, according to a formula based on a corrected metabolic weight. For the next 18 h some rumen parameters (pH; L- Lactate level; titratable acidity and redox potential), hematological (plasma volume deficit PVD) and clinical picture were followed. For complete recovering many animals needed, at the 18h, a treatment based on withdraw of all rumen fluid and replacement with healthy rumen fluid and water, and intravenously infusion of large amount of Lactated Ringer Solution. The distribution of all data was evaluated using the Kolgomorov-Smirnov test followed by repeated measures modelling with PROC-MIXED and coefficient of determination (R^2) in the SAS.

Results: Rumen pH and L-Lactate levels were lower and higher, respectively, at the 3rd, 6th and 18th h in the control group (P= 0.019). Both titratable acidity (12th and 18th h), and redox potential (3rd, 6h, and 12th) were higher in the control group (P = 0.03). The R^2 for rumen pH with the following variables L-Lactate level, redox potential and titratable acidity were 0.91, 0.96 and 0.87, respectively. These results suggested that the principal acid produced in this induction was L-Lactate and somehow V+M decreased the production of this acid probably by interference with Lactobacillus sp population growth, most important rumen lactate producer, since this bacteria requires very high rumen redox potential to growth. There was a tendency (P= 0.1) for the PVD to be higher in the control group at the 18th h, sugesting a more developed degree of dehydration. Most of the cattle (4/6) of the control group exhibited pronounced clinical signs as compared to the V+M group (1/6), mainly shown by severe dehydration (sunken eyes and coldness in the extremities), recumbency, mental depression that required rapid treatment for complete recovery thereafter.

Conclusions: This experiment showed that V+M used preventively could mitigate the risk of a very severe RLA by decreasing the production of rumen lactate, and the rumen redox potential and thus avoiding a very sharp drop in the rumen pH that could cause harmful clinical signs.

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Effect of duration and temperature during the delivery of bovine urine samples to the analytical laboratory on metabolic parameters assays

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Objectives: Urine samples collected in bovine medecine are often exposed to a range of environmental conditions prior to analysis in a laboratory. The stability of the molecules in the bovine urine is poorly understood. The aim of this study was to determine the stability of urine specimens exposed to a range times and two storage temperatures.

Materials and Methods: Urine samples were taken with a urinary catheter in 10 lactating Montbeliarde cows in one farm, 1.5 hours after the morning diet distribution. The samples were immediately placed in a cooler box, protected from light, and sent to the laboratory. For each cow, the sample is divided into 17 aliquots. one aliquote was centrifuged and analyzed in the 3 hours after collection (D0) as controls. 8 aliquots, were placed in a refrigerated chamber at 4°C and 8 aliquots, left at room temperature (25°C). All the samples were kept sheltered from the light. The day D1, D2, D3, D4, D7, D8, D9, D10, one aliquote stored at room temperature and one kept cool tube were centrifuged and analyzed. The analysis method used was a enzymatic colorimetric method with an automated biochemistry analyser (JEOL Biomajesty 6010 with Biomérieux, Diasys, Diacron and Randox kits).

Statistical analysis was performed with the Excel © software. For each biochemical parameter, outliers were removed by the Grubbs test. For each pair number storage day / storage temperature and each parameter, the averages of the 10 cows was compared with the average to D0 by a Student's t test for paired data if normal distribution (checked by Shapiro-Wilk test) and variance equal (verified by Cochran's test) or by test of Wilcoxon signed rank in other cases. The results of stored samples were considered to be different from the value on D0 (reference) if the difference between average of stored samples and D0 average was greater than the measurement uncertainty or if p> 0.05.

Results: Assay results are identical to the D0 value during the numbers of days (d) following : (for samples stored at 4°C and 25°C respectively) ; calcium 10 d, 10 d ; chloride 10 d, 10 d ; total carbon dioxide 7 d, 7 d ; creatinine 10 d, 10 d ; magnesium 4 d, 4 d ; Phosphate Inorganic 2 d, 2 d ; Potassium 10 d, 10 d ; Sodium 10 d, 10 d ; Urea 10 d, 10 d.

Our results show a stability of creatinine much longer than that reported by Saliman et al in 1986, against we find the same duration stability for urea.

Conclusions: The storage temperature has no effect on the duration of biochemical parameters stability in urine until 10 days.

The stability of biochemical specimens is very long, it reached 10 days except for Phosphate Inorganic (2 d.) and to a lesser extent magnesium (4 d.).

The duration stability in urine is better than in blood except for Phosphate Inorganic and magnesium. These results show a very good stability of urine parameters in cattle. The use of this biochimical assays should not be limited even if the delivery times in the laboratory is several days.

Comments: Soliman S.A., Abdel-Hay M.H., Sulaiman M.I. Tayed O.S. 1986. Stability of cratinine, urea and uric acid in urine stored under various conditions. Clinica Chimica Acta, 160 319-326.