

Correlation between L-lactate concentrations obtained using a handheld Lactate analyzer and a lactate assay colorimetric kit in beef cattle

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Introduction

- Blood metabolites are used to assess a variety of animal conditions for veterinary diagnosis and research.
- Lactate is the product of anaerobic glycolysis, used in animal research as an indicator of muscle damage.
- Lactate is used in transport research as an indicator of muscle fatigue.
- The concentration of these metabolites can be measured using a commercially available lab-based assay or using a handheld device developed to be more time and cost effective than the lab-based method.

Objective

- The aim of this study was to assess the correlation between L-lactate concentrations measured using a Lactate Scout+ analyzer (Lactate Scout, EFK Diagnostics, Barleben, Germany) and a lactate assay colorimetric kit (Lactate Assay Kit, Cell Biolabs, Inc., San Diego, CA, USA).

Material and Methods

- Blood samples were collected from 96 steers at 10 different sampling points: prior to and after 36 h of transport and prior to and after additional 4 h of road transportation, and on days 1, 2, 3, 6, 14 and 28 after the 4 h transport.
- Blood samples were collected into sodium fluoride tubes, for use in the colorimetric analysis, while the Lactate Scout+ analyzer strip was dipped in blood at the time of sampling.
- **Statistics:** Pearson's product-moment correlations were performed to determine the relationship between L-lactate concentrations obtained via the methods described for each sampling point, as well as for the average of all sampling points.

Results

- The strengths and levels of statistical significance of the correlation varied over the observed time points (Table 1).

Sampling point	r	p-value
1	-0.03	0.74
2	0.37	<0.01
3	0.61	<0.01
4	0.59	<0.01
5	0.37	<0.01
6	0.64	<0.01
7	0.75	<0.01
8	0.28	<0.01
9	0.69	<0.01
10	0.64	<0.01

Table 1. Pearson's product-moment correlation coefficient (*r*) of L-lactate measured using Lactate Scout+ analyzer and a lactate assay at each sampling point.

- The correlation for the pooled data was weak but statistically significant ($r = 0.33, p < 0.001$).



Conclusions

- Based on these results, the Lactate Scout+ analyzer is not a suitable alternative to a lab-based assay for measuring L-lactate in transported cattle, due to variability across sampling time points, and weak correlation with the traditional enzymatic method.

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