

Evaluation of a new handheld point-of-care blood gas analyser using 100 equine blood samples

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Blood gas analysis is frequently performed during anaesthesia of horses. This study evaluated the accuracy and precision of a new point-of-care analyser (EPOC Blood Gas Analyser) compared with a standard hospital analyser (Radiometer ABL 77).

Informed owner consent was obtained to utilise surplus blood from samples taken for clinically relevant reasons. To evaluate agreement, 100 arterial or venous samples from 46 horses were analysed on both machines consecutively and in randomised order. To evaluate EPOC analyser precision, 20 samples were analysed twice, in rapid succession. Lactate was compared between EPOC and the handheld Accutrend Plus System. All machines were serviced and calibrated, and all cartridges handled, according to manufacturer's instructions. All blood samples were handled at ambient temperature except for precision assessment when samples were refrigerated between analyses. Agreement was assessed using Bland-Altman analysis and precision by using coefficient of variation (CV%).

Results are given in Table 1. Agreement with published guidelines (Ehrmeyer et al. 1990), or ≤ 2 SD of the reference machine mean (if no guidelines existed), was found for all parameters tested. For precision samples, CV% were all $<10\%$, except for base excess.

The EPOC analyser produces clinically acceptable agreement compared with a hospital blood gas analyser for most assessed parameters.

Table 1 Bias (Radiometer minus EPOC), limits of agreement and precision (coefficient of variation, CV%) of the EPOC Analyser

	Bias	Limits of agreement	Precision of EPOC (CV %)
pH	-0.03	0.03	0.07
PCO ₂ (kPa)	0.36	0.56	2.90
PO ₂ (kPa)	0.35	2.29	2.60
Bicarbonate (mmol l ⁻¹)	-0.92	2.64	3.05
Base excess extracellular fluid	-1.09	2.87	21.67
SO ₂ (%)	1.10	7.65	0.81
Haematocrit (%)	-1.36	5.40	4.26
Haemoglobin (g dl ⁻¹)	-1.00	1.84	4.08
Ionised calcium (mmol l ⁻¹)	-0.10	0.14	1.26
Lactate (mmol l ⁻¹)	0.10	2.82	9.15
Sodium (mmol l ⁻¹)	-2.08	5.93	0.25
Potassium (mmol l ⁻¹)	-0.08	0.37	0.19

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