

Comparison of three methods for blood lead analysis in cattle: graphite furnace atomic absorption spectrometry (AAS), inductively-coupled atomic emissions spectroscopy (ICP), and LeadCare® II system

AAS and ICP are commonly used for blood lead analysis in veterinary diagnostic laboratories. The newer LeadCare® II system (LCS) is rapid, portable, inexpensive and requires minimal technical skill. We compared the three methods of lead analysis for whole-blood samples from 57 cattle exposed to lead. Effects of blood clotting on AAS and ICP, sample size on ICP, and 72-hr delay of analysis on LCS were also determined.

ICP was rank-correlated ($r_{sp}=0.88$) with AAS. Correlation was weaker for measurements $>15\text{mcg/dl}$; no acceptable conversion formula was found. Rank correlation was strong ($r_{sp}=0.96$) between LCS and AAS; the conversion formula was $\text{AAS}=1.3(\text{LCS})-0.11$ ($R^2=0.99$). Neither AAS nor ICP was affected by clotting. Small samples had higher lead measurements than larger samples (median 31 versus 9.2mcg/dl). Storage increased LCS measurements but the median difference was 0 and the range only 5.3mcg/dl higher to 4mcg/dl lower. Results indicated that LCS is suitable for veterinary diagnostic use.

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