

## A lean six sigma approach to the improvement of the selenium analysis method

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Since reliable results represent the 'pinnacle assessment of quality' of an analytical laboratory, 'variability' is considered to be a critical quality problem associated with the selenium analysis method executed at Western Cape Provincial Veterinary Laboratory (WCPVL). Due to the narrow margin of safety between toxic and deficient doses of the trace element for good animal health, the elimination and control of 'variability' is undoubtedly of significant importance. To overcome the adverse effect of variation, steps towards analytical process improvement using a quality methodology known as Lean Six Sigma, was believed to present the most feasible solution. Lean Six Sigma represents a form of scientific method type, which is empirical, inductive and deductive, systematic, relies on data and is fact-based. The Lean Six Sigma methodology comprise of five macro-phases, namely, define, measure, analyse, improve and control (DMAIC). Both qualitative and quantitative laboratory data were collected in terms of these phases. Qualitative data was collected using quality tools, namely an Ishikawa diagram, Pareto chart, Kaizen analysis and a Failure Mode Effect analysis tool. Quantitative laboratory data, based on the analytical chemistry test method, was collected through a controlled experiment. Laboratory results obtained from the controlled experiment was analysed using statistical methods, commonly associated with quality validation of chemistry procedures. Analysis of both sets of data yielded an improved selenium analysis method, believed to provide greater reliability of results, in addition to a greatly reduced cycle time and superior control features. Lean Six Sigma may therefore be regarded as a valuable tool in any laboratory, and represents both a management discipline, and a standardised approach to problem solving and process optimization.

### Biography

Bronwyn Claudia Swartz has been employed in the field of veterinary diagnostics for the past 15 years. She has worked in a number of disciplines as a veterinary technologist, including histology, virology, microbiology and most significantly biochemistry. It is in the chemistry arena that she most enjoyed the merger of quality design and practice with analytical laboratory work. She graduated her master's degree in Quality with Cum Laude honors at Cape Peninsula University of Technology, and currently acts as the subject coordinator of, and presents the subject Statistical Quality Techniques III to the current students at the Engineering faculty.

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