



## Comparison of the SQA-Vb Sperm Quality Analyzer for Bovine Semen and the Coulter Counter

Item	SQA-Vb	Coulter Counter
General view		
Technology	<p><b>Signal processing:</b> Electronic signals are detected in two independent channels, digitized and analyzed by an internal processor and proprietary algorithms.</p>	<p><b>Sperm cell counting principle:</b> Electrical sensing zone technique for counting cells or particles 1-120 microns in size. Instrument allows the operator to set one - two size thresholds. All cells <math>\geq</math> to this setting will be counted. Optimal performance with uniform cell size.</p>
Parameters	<p>Sperm Concentration Motility Progressive Motility Motile Sperm Concentration Progressively Motile Sperm Concentration Velocity Morphology</p>	<p>Number of cells in 0.5 ml</p> <p>To obtain concentration, the dilution factor should be entered</p>
Automation	Full	Full
Sample type	Fresh and Frozen	Fresh and Frozen
Loading sample volume, $\mu$ l	<p>FRESH: 100 <math>\mu</math>l sample in 2 ml Diluent FROZEN: 200 <math>\mu</math>l in 500 <math>\mu</math>l Diluent TESTING CAPILLARY: 500 <math>\mu</math>l</p>	200 $\mu$ l
Number of cells analyzed	Tens of thousands in motility channel and millions in concentration channel	Up to thousands depending on the dilution rate

<b>Sample preparation</b>	Dilute according to on-screen instructions.	Variable dilution depending upon sample quality (=> 50 fold). The user must decide how to prepare the sample.
<b>Navigation through the screens</b>	User friendly man-machine interface displayed on operational screens leads the user through the entire testing, dilution, dosing and complete test reporting process.  Uniquely designed for bovine semen testing, dosing and reporting with data base management system.	Display shows the number of cells detected  No man-machine interface for bull semen analysis: The device is designed as a general mammalian cell counter.
<b>Testing time</b>	~ 1 minute	~ Seconds
<b>Results</b>	Fully automated, objective and standardized bovine semen analysis test results for SEVEN semen parameters:  Sperm Concentration Motility Progressive Motility Motile Sperm Concentration Progressively Motile Sperm Concentration Velocity Morphology	Number of cells
<b>Calibration</b>	Not required: Device is pre-calibrated by the manufacturer	Calibration and settings are required
<b>Dosing</b>	Complete dosing instructions	No dosing feature
<b>Accuracy</b>	High clinical correlation to both the microscope and IVOS (CASA) system specific to bovine semen analysis	No comparison data
<b>Precision</b>	High precision: Sperm Concentration: CV = 2.4 % Motility: CV = 4.1 % Morphology: CV = 5.0 %	The coincidence correction table required if count is greater than 10,000.  No data for precision.
<b>Summary of Limitations</b>	Disposable re-use requires washing	<ul style="list-style-type: none"> <li>• Only # of cells is assessed</li> <li>• Overestimation of concentration</li> <li>• No dosing feature</li> <li>• Not specific to BOVINE testing</li> <li>• Designed as a general cell counter for mammalian cells</li> <li>• Statistical counting errors</li> <li>• Dilution errors</li> <li>• The system should be flushed when counting is finished</li> <li>• If the aperture is clogged with debris it should be cleaned with the brush provided</li> </ul>

## References:

1. SQA-Vb User Guide, 2007.
2. SQA-Vb Product Performance Data, 2008.
3. Description of the Beckman Coulter (web site: [http://www.beckmancoulter.com/products/instrument/partChar/pc\\_z1.asp](http://www.beckmancoulter.com/products/instrument/partChar/pc_z1.asp)).
4. Using the Coulter Counter (web site: [http://pingu.salk.edu/~sefton/Hyper\\_protocols/coulter.html](http://pingu.salk.edu/~sefton/Hyper_protocols/coulter.html)).