SQA-Ve

NEW TECHNOLOGY
in the Equine Industry

Medical Electronic Systems

- **Established in 1993 in Israel.**
- **2005: Offices established in Vienna and Los Angeles**
- **2007: Offices opened in Belgium and Hong Kong**
- **Technology Focus: Medical Electronics**
  - **Electro-optical engineering**
  - **Computer algorithms**
  - **Video microscopy**
- **Commercialized automated semen analysis technology for both human and animal applications (SQA – Sperm Quality Analyzer)**
- **Installed base ~ 2,500 systems worldwide**

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HUMAN SPERM QUALITY ANALYZERS

SQA-V

SQA II CP

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ANIMAL SPERM QUALITY ANALYZERS

SQA-Vt
TURKEY

SQA-Vp
PIG

SQA-Ve
EQUINE

SQA-Vb
BULL

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SOFTWARE PRODUCTS

V-Sperm™ Video and Data Management Software (both English and Russian)

T-Sperm™ Turkey Video, Data and Flock Management Software

B-Sperm™ Bull Video, Herd and Data Management and Dosing Software

P-Sperm™ Pig Video, Herd and Data Management and Dosing Software

Qwik-Link™ LIS interface for information transfer to a centralized database

Qwik-Check™ Kits

QwikCheck™ BEADS

- ✓ Quality control latex beads for testing sperm concentration
- ✓ 3 Levels: High, Low, Negative
- ✓ Labeled for use on the SQA-V
- ✓ Can be used on sperm counting chambers
- ✓ Item #0200

QwikCheck™ LIQUEFACTION

- ✓ Quickly liquefies viscous semen samples
- ✓ 20 – single dose vials
- ✓ Easy to use
- ✓ Item #0900

QwikCheck™ TEST STRIPS

- ✓ Reagent test strips for semen analysis
- ✓ Measures Leukocytes and pH in semen
- ✓ 100 strips per bottle
- ✓ Item #0700

QwikCheck™ DILUTION

- ✓ Dilution media for semen
- ✓ 50 ml sterile solution
- ✓ Item #0800

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Why Automate Semen Analysis?

Manual Semen Analysis is:

- Time consuming – 70 minutes if done correctly following WHO standards
- Highly variable – Errors counting highly motile cells. Some parameters such as morphology are highly subjective.
- Labor intensive and requires special training – Preparation of stained slides, counting> 200 moving cells, etc.
- Not standardized – high variability between labs and technicians

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SQA-Ve Advantages

- Results in less than one minute
- Fully automated
- Dosing instructions provided automatically
- Accurate, repeatable results
- User friendly interactive screens
- Counts thousands of cells automatically compared to hundreds of cells manually

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CASA Limitations

- Expensive and requires a variety of modules
- Requires considerable lab space (compared to the SQA-V)
- Settings must be set prior to each analysis
- Parameter setting are subjective
- Requires extensive training and re-validation of technician competency

The SQA Ve: Applications for Testing Equine Semen

- **Fresh semen:**
- Routine semen analysis
- For dosing calculations performed based on Total/ Motile / Prog. Motile cells per AI dose
- **Extended semen :** samples can be evaluated for QC
- **Frozen semen :** samples can be evaluated for QC

SQA-Ve: System Components

- **SQA-Ve**
- **E-Sperm data export table**
- **SQA-Ve Start-up Kit**
- **Test Kit with I-button and 50 testing capillaries (500 tests)**
- **Cleaning Kit**

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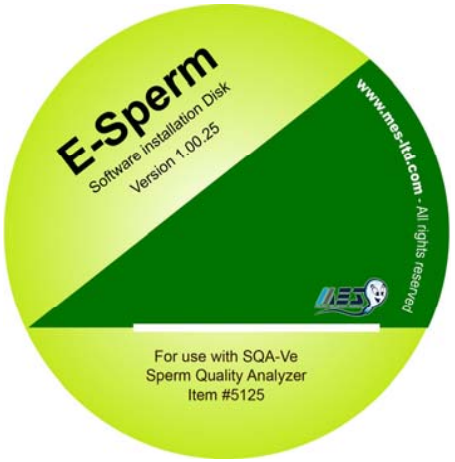
SQA-Ve Components

Disposable testing capillary (10 uses)

Heater for samples & capillaries

SQA-V Cleaning Kit



Export data to the PC

SQA-Ve Overview

The SQA-Ve automatically measures the following parameters :

Semen Parameters	
Concentration M/ml (TSC)	Morphology (% Normal) (FRESH SAMPLE ONLY)
Motility %	Motile Sperm Concentration (MSC)
Progressive Motility %	Progressive Motile Sperm Concentration (PMSC)
Velocity (mic/sec)	Total # Sperm Total # Motile Sperm Total # Prog. Motile Sperm (Per ejaculate)

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Sample Testing

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Preparing Fresh/Extended Samples

- **Place new testing capillaries and 10-ml containers in the heating device**
- **Distribute 2 ml of fresh semen into a 10-ml container provided in the test kit.**
- **Close the plastic container and pre-heat the semen to 37°C (98.6°F) for:**
  - **4 minutes (room temperature sample)**
  - **5 minutes (extended, cooled semen)**
- **Gently and thoroughly mix the sample for 10 seconds**
- **The sample is now ready for testing**

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Testing and Dosing FRESH Samples

Fresh samples can be tested and dosing calculations performed based on total, motile or progressively motile sperm per AI dose

ENTER SAMPLE DATA: FRESH

DATE: 01/04/05	**TIME: 08 :15**
STALLION ID:	**28**
SAMPLE #:	**1**
SEMEN VOLUME:	**100.0 ml**
PERFORM DOSING?	**YES/NO**
DOSING TYPE:	**EXTENDED/FROZEN**

DOSING SETTINGS: EXTENDED

DOSING BY:	**TOTAL/MOTILE/PROG. MOTILE**
MINIMUM # SPERM CELLS PER DOSE:	**500 M**
CONCENTRATION TARGET:	**50 M/ml**
MAXIMUM DOSE VOLUME:	**30.0 ml**

DOSIMETRY SETTINGS: FROZEN

DOSING BY:	TOTAL/MOTILE**/PROG. MOTILE**
# SPERM CELLS IN A DOSE:	**500.0 M**
DOSE VOLUME:	**0.5 ml**

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Testing and Dosing FRESH Samples

TEST RESULTS: FRESH SAMPLE

CONC.	332.6 M/ml	MSC	259.1 M/ml
MOTILITY	77.9 %	PMSC	183.9 M/ml
PR. MOT.	55.3 %	VELOCITY	32 mic/sec
MORPHOLOGY	73.3%		

TOTALS		SPERM #	33.3 Bil
PER		MOT. SPERM	26.0 Bil
EJACULATE		PR. SPERM	18 Bil

DOSE PREPARATION: EXTENDED

DOSING BY:	PROG. MOTILE
SEMEN VOLUME:	100.0 ml
EXTENDER VOLUME:	235 ml
TOTAL VOLUME:	335 ml
# DOSES:	17
# SPERM CELLS / DOSE:	503 M
DOSE VOLUME:	20.0 ml

DOSE PREPARATION: FROZEN

DOSING BY: TOTAL/MOTILE / **PROG. MOTILE**

ADD EXTENDER TO PELLET UP TO:	22 ml
DOSES:	44
# SPERM CELLS / DOSE:	500 M

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Testing Extended Semen Samples

ENTER SAMPLE DATA: EXTENDED

DATE: 01/04/05	**TIME: 08 :15 : 59**
STALLION ID:	**28**
SAMPLE #:	**2**
SEMEN VOLUME:	**60 ml**

TEST RESULTS: EXTENDED SAMPLE

CONC.	**42.6 M/ml**	**MSC**	**25.9.1M/ml**
MOTILITY	**77.9 %**	**PMSC**	**183.9 M/ml**
PR. MOT.	**55.3 %**	**VELOC.**	**62 mic/sec**

TOTALS PER SEMEN VOLUME

SPERM #	**2.56 Bil**
MOT. SPERM	**1.99 Bil**
PR. SPERM	**1.43Bil**

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Testing FROZEN Semen Samples

SEMEN ANALYSIS REPORT: FROZEN SAMPLE

DATE: 01/04/05	**TIME: 08 :15 : 59**
STALLION ID:	**28**
STRAW DATE:	**01/04/05**
SAMPLE #:	**4**
SEMEN VOLUME:	**0.5 ml**

TEST RESULTS: FROZEN SAMPLE

CONC.	**420.6 M/ml**	**MSC**	**254.4M/ml**
MOTILITY	**60.5 %**	**PMSC**	**177.9 M/ml**
PR. MOT.	**42..3 %**	**VELOC.**	**32 mic/sec**

TOTALS PER SEMEN VOLUME

SPERM #	**166.3 M**
MOT. SPERM	**129.6 M**
PR. SPERM	**92.0 M**

TEST RESULTS: LOW QUALITY SAMPLE

CONC.	**NA**	**MSC**	**59.1M/ml**
MOTILITY	**NA**	**PMSC**	**15.2 M/ml**
PR. MOT.	**< 35.0 %**	**VELOC.**	**22 mic/sec**

TOTALS PER SEMEN VOLUME

SPERM #	**NA**
MOT. SPERM	**29.6 M**
PR. SPERM	**7.6 M**

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Export Test Results to E-Sperm Table

Test results and stallion information can be exported in .csv or Excel format:

SQA-Ve Equine Test Results: FRESH SAMPLES

SQA-Ve (EQUINE) SAMPLE DATA								TEST RESULTS									
Date	Time	Stallion ID	Sample			Perform Dosing?	Dosing Type	Conc., M/ml	Motility, %	Prog. Mot., %	Morph., %	MSC, M/ml	PMSC, M/ml	Velocity, mic/sec	# Sperm, Bil	Mot. Sperm, Bil	Prog. Sperm, Bil
			Type	ID #	Volume, ml												
10/1/2008	18:03	123	Fresh	1	90	Yes	Extended	152.6	52.4	46.0	62.0	79.9	70.2	93	13.7	7.2	6.3
14/1/2008	10:10	15	Fresh	3	110	Yes	Extended	63.2	72.1	44.1	73.1	45.5	27.9	91	7.0	5.0	3.1
14/1/2008	10:15	159	Fresh	4	55	Yes	Extended	214.4	85.2	83.7	80.6	182.6	179.4	125	11.8	10.0	9.9
14/1/2008	10:26	456	Fresh	5	40	Yes	Extended	109.1	67.1	50.6	70.3	73.2	55.2	99	4.4	2.9	2.2
14/1/2008	10:29	147	Fresh	6	60	Yes	Extended	87.6	83.5	82.0	79.6	73.2	71.9	125	5.3	4.4	4.3
14/1/2008	10:34	143	Fresh	7	100	Yes	Frozen	84.3	46.2	44.9	58.5	38.9	37.8	92	8.4	3.9	3.8
14/1/2008	10:38	158	Fresh	8	85	Yes	Frozen	62.3	9.9	9.4	N/A	6.2	5.9	16	5.3	0.5	0.5
14/1/2008	10:45	120	Fresh	9	75	Yes	Frozen	138.9	75.0	52.7	74.8	104.2	73.2	102	10.4	7.8	5.5
14/1/2008	11:07	118	Fresh	10	65	Yes	Extended	71.0	67.5	40.3	70.6	47.9	28.6	85	4.6	3.1	1.9

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SQA-Ve Technology and Performance Data

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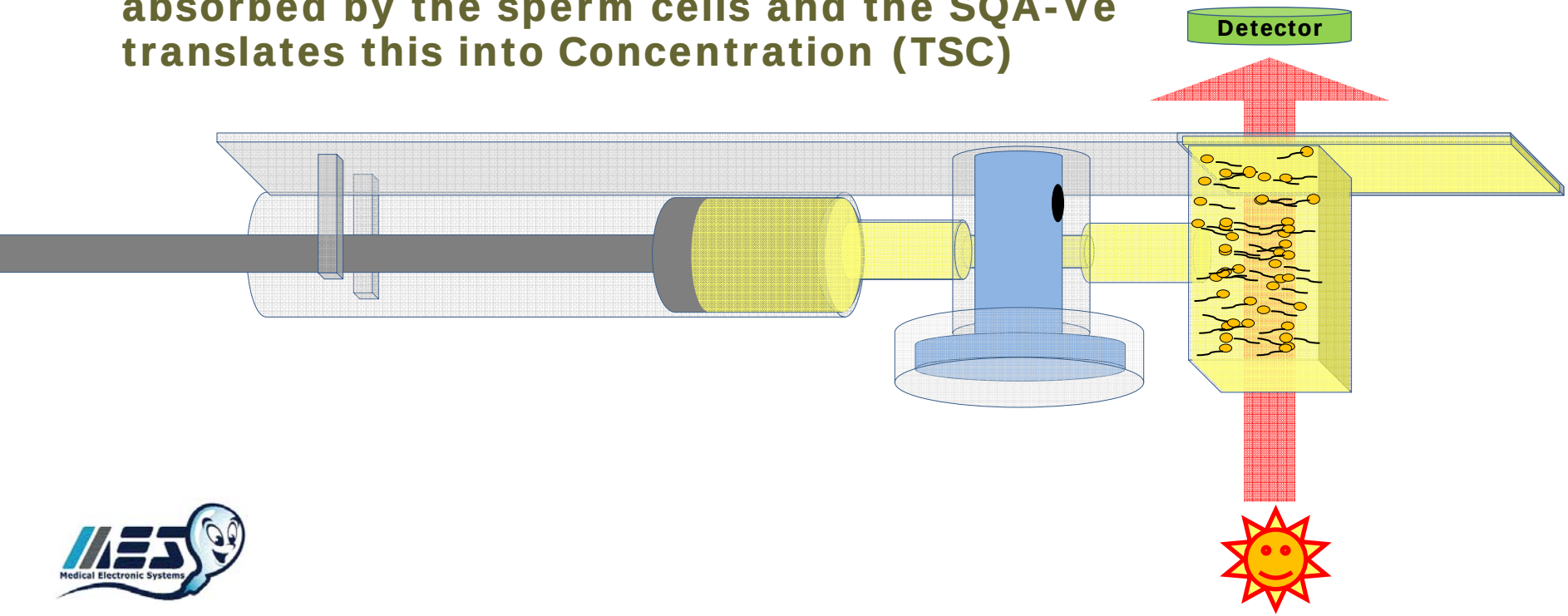
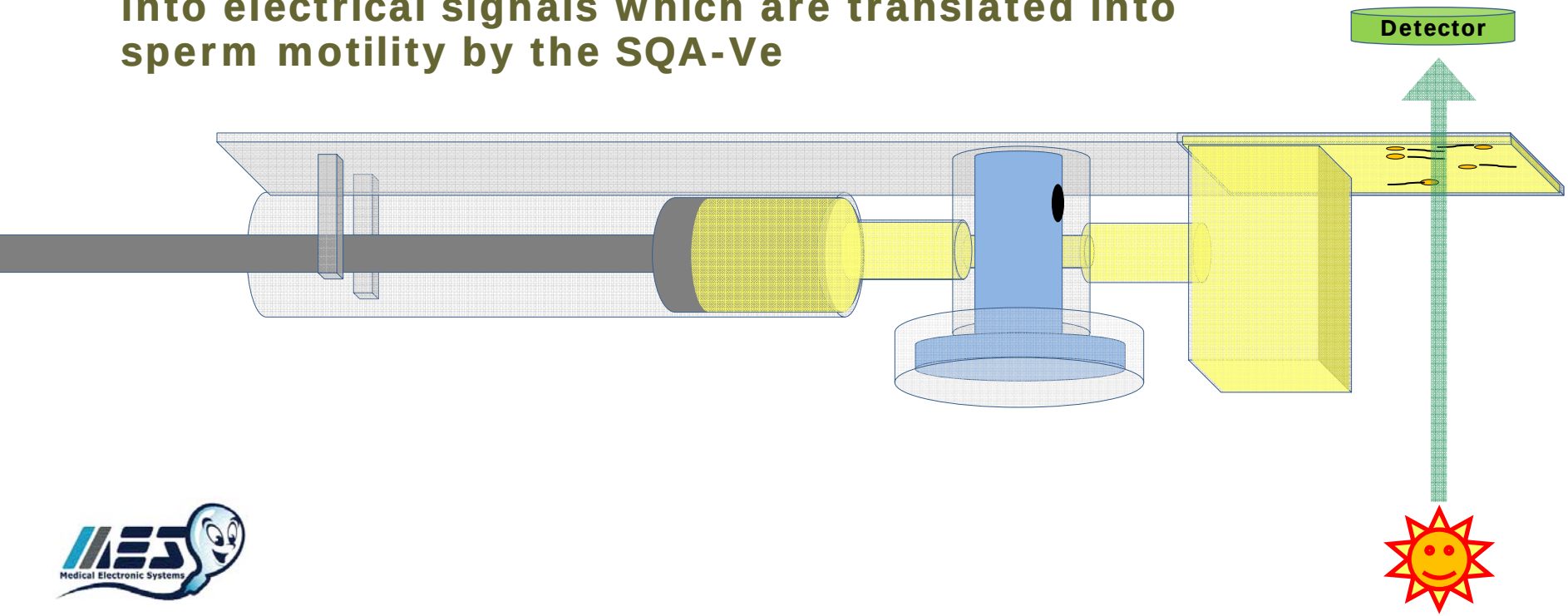
Technology: Measuring Concentration

- **Concentration is measured by analyzing millions of sperm cells in the cuvette section of the SQA-Ve testing capillary**
- **An LED light passing through the cuvette section is absorbed by the sperm cells**
- **A detector measures the amount of light absorbed by the sperm cells and the SQA-Ve translates this into Concentration (TSC)**



Technology: Measuring Concentration

- **Motility is measured by analyzing tens of thousands of sperm cells in the thin section of the SQA-V capillary**
- **Motile cells pass through a light source creating disturbances in the beam of light**
- **A motility detector converts the light disturbances into electrical signals which are translated into sperm motility by the SQA-Ve**



SQA-Ve Dynamic Range

Sample Type	Concentration M/ml	% Motility	% Progressive Motility	% Normal Morphology
Fresh	0-550	0-100	0-100	0-100
Extended	0-300	0-100	0-100	-
Frozen	0-600	0-100	0-100	-

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Performance Claims FRESH Semen

Precision: SQA-Ve intra- and inter-device Variability

Semen Parameters	Intra-device CV, %	Inter-device CV, %
Sperm Concentration	2.0	7.0
Motility	0.3	7.2
Prog. Motility	5.6	8.6
Morphology	0.3	2.6

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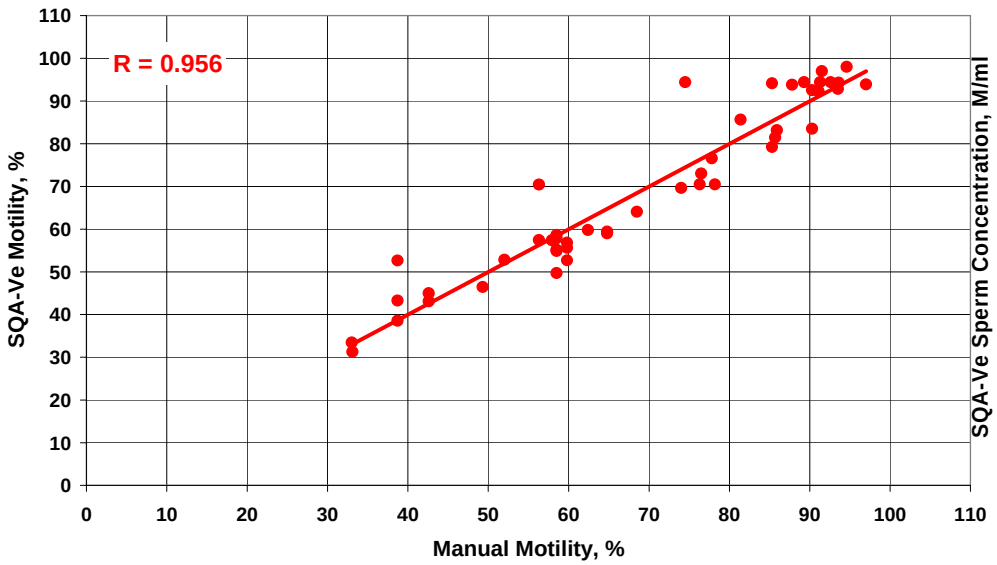
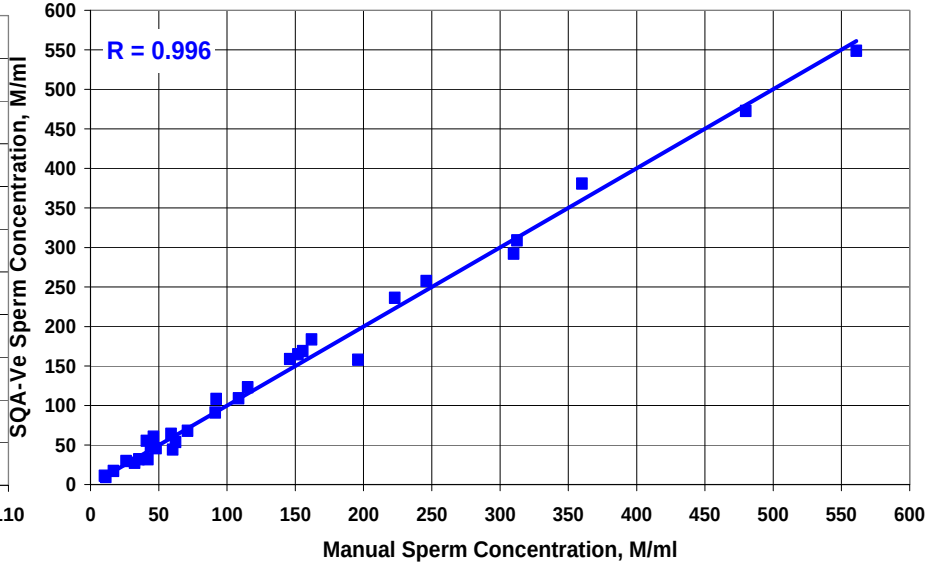
SQA-Ve Performance Data

Correlation to Manual Method FRESH Semen

Semen Parameters	Correlation coefficients R value
Sperm Concentration, M/ml	0.996
Motility, %	0.956
Progressive Motility, %	0.892
Morphology, %	0.744





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The End

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