SQA-Vp

NEW TECHNOLOGY

in the Pig Industry

P-Sperm

Data Management Software for the SQA-Vp

P-Sperm Software

P-Sperm is the data management software that works together with the SQA-Vp to:

- **Store and sort test results on the PC for analysis, graphing, etc.**
- **Provide documentation of the entire testing, dosing and storage cycle.**
- **View sperm samples on the PC monitor.**
- **Capture and store video clips and images.**
- **Set-up SQA-Vb system defaults**
- **Secure information (password protected).**

Medical Electronic Systems

P-Sperm Software

B-Sperm navigation is easy. To access various menus and options:

- Click on one of seven navigation buttons that are always available in the left margin of the screen.
- Note the sub-menu buttons across the top of the P-Sperm screen that display additional options to run reports, export data, etc.

P-Sperm Software

A variety of icons guide the user through the P-Sperm features and options:

< > Test results out of clinical range: One or more of the test results are out of clinical range.

! Dosing mismatch: The selected dosing requirements cannot be implemented. This can happen when:

- The set-up values have been entered incorrectly
- The semen sample is of low quality

Picture indicator: A picture has been attached to the test results.

Video Indicator: A video clip has been attached to the test results.

Graphs: Test results can be graphed by clicking on the icon and selecting the parameter to be graphed.

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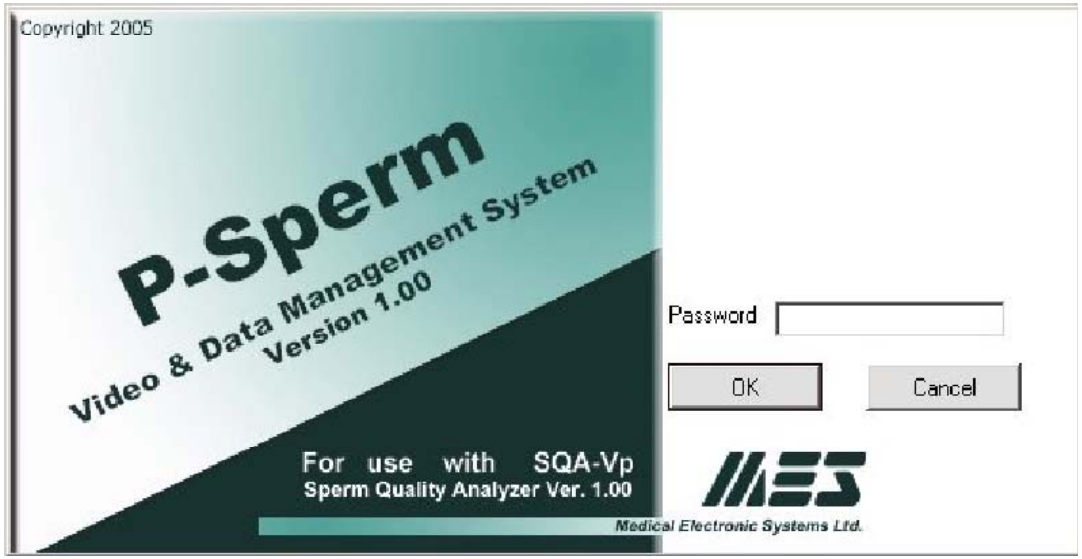
Entry Screen

Enter P-Sperm using:

- **Password: fertility**
- **Click: OK**



Test Data

- **The first navigation button is TEST DATA. From this screen the user can locate, select and analyze test results that have been imported from the SQA-Vp.**
- **Click the navigation button TEST DATA and three sub-buttons will appear:**
  - **Dosing – Fresh**
  - **Extended**
  - **Daily Report**

Overview of P-Sperm

- **There are two basic sub-menus in P-Sperm that display test results imported from the SQA-Vp:**

  Dosing-Fresh & Extended

- **From these two sub-menus, the following features can be activated:**

Features	Dosing-Fresh	Extended
Dosing Set-Up; dosing on-line	X	
Import tests from the SQA-Vp	X	X
Sort, Hide, Freeze Columns, View All	X	X
Run Graphs of individual boar test results	X	X
Capture images, Export data and run reports	X	X

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Dosing-Fresh

DOSING-FRESH - Select this button to:

- View the test data from the DOSING mode of the SQA-Vp
- Activate the dosing feature and determine how to divide up a sample by total, motile or morphologically normal sperm in a dose
- Activate the EXPORT TEST feature
- Evaluate test results and run reports, graphs, view attached clips, etc.

Dosing-Fresh: Test Parameters

Parameter	Value
Sperm Concentration	Millions per milliliter
Motile Sperm Concentration (MSC)	Millions per milliliter
Motility	%
Motility Grading	[0-5]
Morphology	%
Sperm #	Billions per ejaculate
Motile Sperm #	Billions per ejaculate

Dosing-Fresh Screen

Dosing - Fresh

Dosing - Fresh

Number of Records 59

Sort | Hide | Freeze Columns | View All

		< >	!			Date	Time	Time from Collect. <30 min.	Boar ID	Boar Name	Sample #	Neat Ejaculate Volume [ml]
▶		< >				23/08/2006	09:22	No	190	Vandredy 7	2	50
		< >				23/08/2006	09:21	No	190	Vandredy 7	1	50
		< >				23/08/2006	09:20	No	189	Vandredy 6	2	100
		< >				23/08/2006	09:19	No	189	Vandredy 6	1	100
		< >				23/08/2006	09:17	No	186	Vandredy 3	1	50
		< >				23/08/2006	09:16	No	184	Vandredy 1	2	150
		< >				23/08/2006	09:15	No	184	Vandredy 1	1	150
		< >				23/08/2006	09:14	No	182	Toledo 13	1	200
						23/08/2006	09:13	No	181	Toledo 12	1	60
						23/08/2006	09:12	No	181	Toledo 12	2	60
		< >				23/08/2006	09:11	No	180	Toledo 11	1	50
		< >				23/08/2006	09:10	No	180	Toledo 11	2	50

Clear All | Select All | Delete | Dosing Set-up

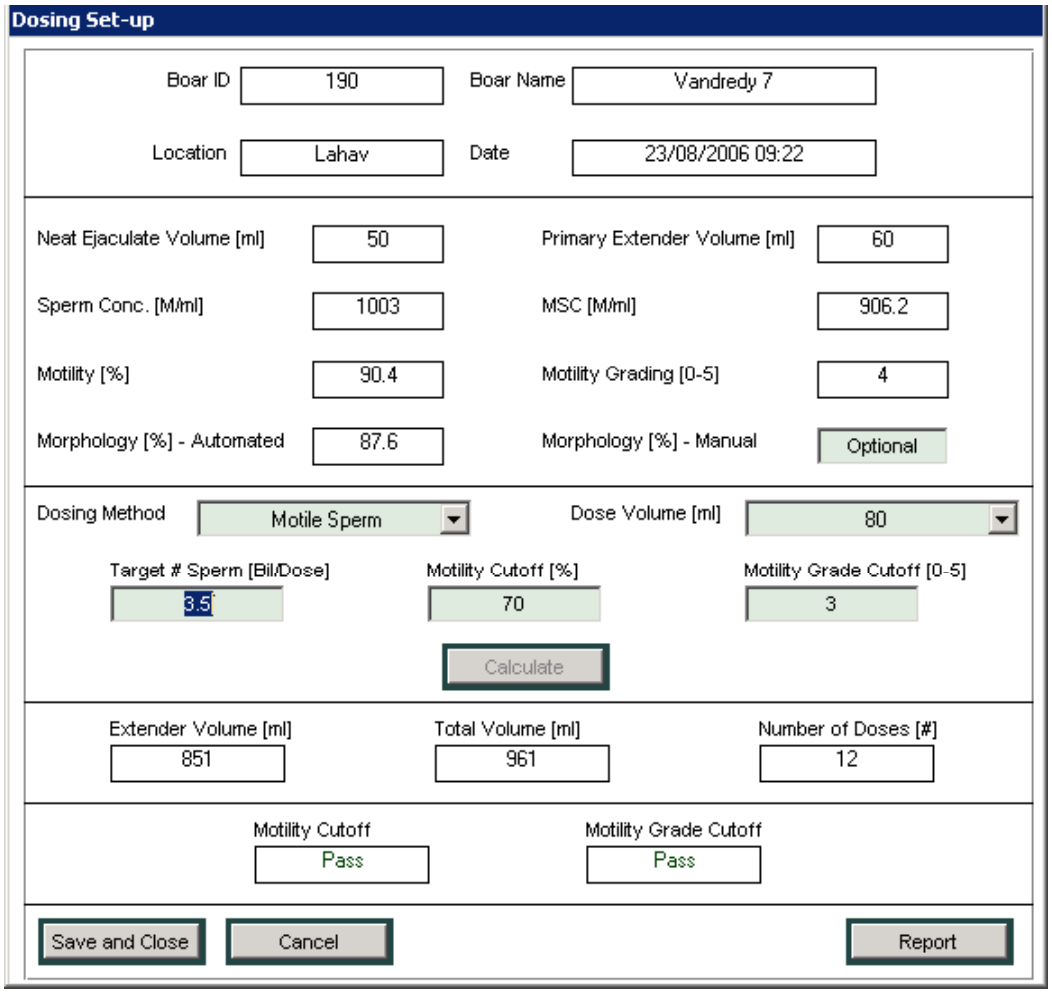
- **Select: Test Data > Dosing-Fresh and the table above will be displayed**
- **Click on the navigation buttons and icons to run a variety of features**

Dosing Calculation

There are two ways to perform dosing calculations:

- **From the SQA-Vp after running a test**
  - **Activate the Test Data > Dosing-Fresh screen in P-Sperm**
  - **Click the IMPORT TEST button when prompted by the SQA-Vp on-screen instructions**
  - **The test results will automatically populate the Dosing Set-up screen will be activated**
- **From P-Sperm after importing data from the SQA-Vp**
  - **Highlight the desired record from the Test Data > Dosing-Fresh spreadsheet**
  - **Click the DOSING SET-UP button**

Dosing Set-up Screen

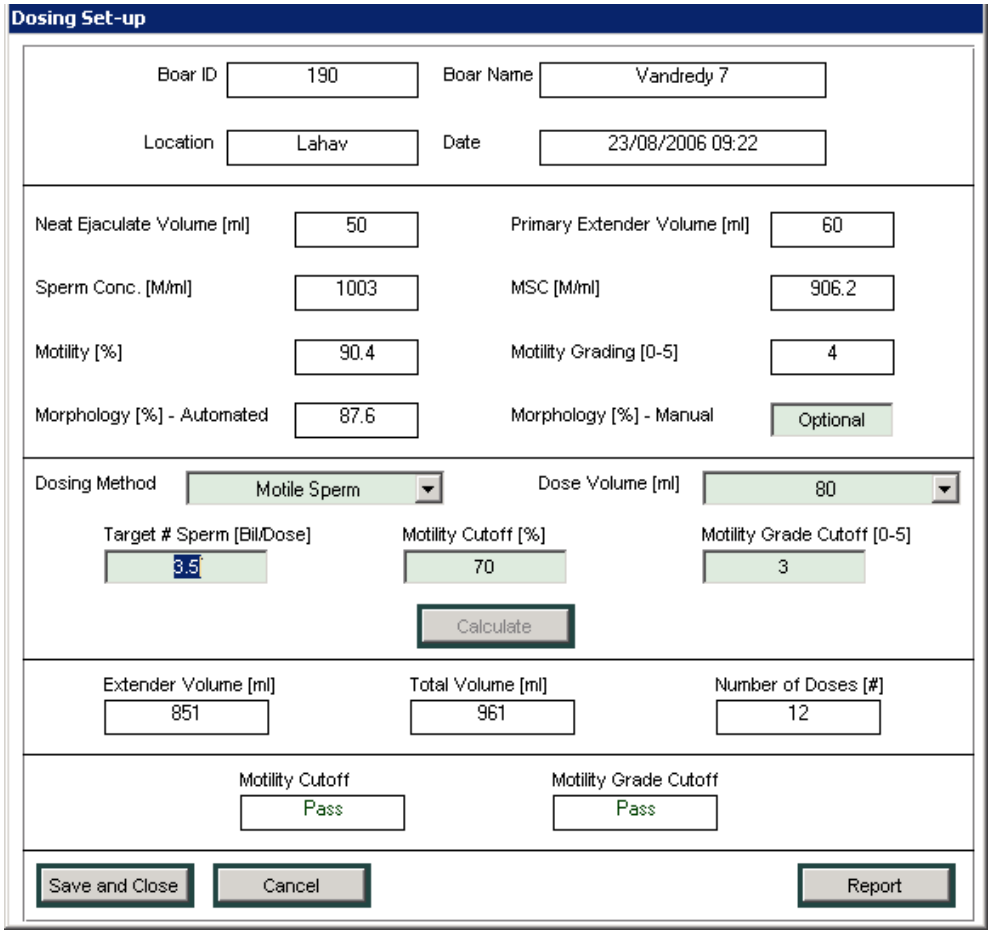


Enter:

- **Dosing Method: The dosing criteria defined by # total, motile or morphologically normal sperm**
- **Dose Volume: The desired final volume of the AI dose**
- **Target # Sperm: The desired number of sperm for each dose**
- **Motility Cutoff: The minimal Motility threshold**
- **Motility Grade Cutoff: The minimal Motility Grade threshold**

Dosing Set-up Screen

- **Click the CALCULATE button to view the:**
  - **Extender Volume: The amount of extender to add to the sample**
  - **Total Volume: The sum of the semen plus the extender volume**
  - **Number of Doses: The total number of doses that can be generated**
- **Click the 'SAVE and CLOSE' button to save the results**
- **Click the REPORT button to view and print the dosing report**



QC-Extended features

Select: Test Data > Extended to:

- **View a report with QC-Extended test data**
- **Manage and evaluate QC-Extended data by individual boar**
- **Evaluate test results and run reports and graphs**
- **View clips and pictures attached to test results**

QC-Extended: Test Parameters

Parameter	Value
Sperm Concentration	Millions per milliliter
Motile Sperm Concentration (MSC)	Millions per milliliter
Motility	%
Motility Grading	[0-5]
Sperm #	Billions per ejaculate
Motile Sperm #	Billions per ejaculate

QC-Extended Screen

Extended

QC - Extended

Number of Records 40

Sort | Hide | Freeze Columns | View All

		< >			Date	Time	Boar ID	Boar Name	Sample #	Dose Prep. Date	Semen Volume [ml]	Aggluti [%
▶		< >			23/08/2006	09:26	189	Vandredy 6	2	23/08/2006	100	2
		< >			23/08/2006	09:25	189	Vandredy 6	1	23/08/2006	100	3
		< >			23/08/2006	09:24	190	Vandredy 7	2	23/08/2006	100	2
		< >			23/08/2006	09:23	190	Vandredy 7	1	23/08/2006	100	2
		< >			22/08/2006	08:26	185	Vandredy 2	1	22/08/2006	100	1
		< >			22/08/2006	08:25	185	Vandredy 2	1	22/08/2006	100	8
					22/08/2006	08:24	178	Sphinx 11	1	22/08/2006	100	9
					22/08/2006	08:23	178	Sphinx 11	2	22/08/2006	100	3
		< >			22/08/2006	08:22	166	Duplex 49	1	22/08/2006	100	2
		< >			22/08/2006	08:21	166	Duplex 49	1	22/08/2006	100	7
		< >			22/08/2006	08:17	179	Toledo 10	1	22/08/2006	100	2
		< >			22/08/2006	08:16	177	Sphinx 10	1	22/08/2006	100	1

Clear All | Select All | Delete

- **Select: Test Data > Extended to display the table above**
- **Click on the navigation buttons and icons to run features**

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Test Data: Daily Report

The DAILY REPORT contains all the test results for both FRESH samples and their associated EXTENDED test results. This report is an excellent tool for measuring the quality of the samples through the entire production process.

SQA-Vp

DAILY PRODUCTION REPORT for 22/08/2006

Sample Data						Fresh Semen Parameters					Dosing Set-up		Dosing Results		Extended Sample Test Results					
Time	Boar ID	Boar Name	Sample #	Neat Ejac. Vol. [ml]	Primary Extend. Vol. [ml]	Sperm Conc. [M/ml]	MSC [M/ml]	Motility [%]	Motility Grading [0-5]	Morph. [%]	Dosing Method	Target # Sperm [Bil/Dose]	Number of Doses [#]	Extender Volume [ml]	Sperm Conc. [M/ml]	MSC [M/ml]	Motility [%]	Motility Grading [0-5]	Totals per Semen Volume	
																			Sperm # [Bil]	Motile Sperm # [Bil]
08:01	166	Duplex 49	1	50	60	864.9	782.7	90.5	4	87.7	Total Sperm	1.5	28	2691	15.5	8.7	56.1	2	1.55	0.9
08:01	166	Duplex 49	1	50	60	864.9	782.7	90.5	4	87.7	Total Sperm	1.5	28	2691	16.2	9.3	57.3	2	1.62	0.9
08:02	168	Duplex 51	2	80	40	1266.9	1023.0	80.8	4	72.4	Motile Sperm	2	40	3080						
08:03	170	Oasis 51	1	45	60	881.6	800.4	90.8	5	88.0	Total Sperm	2	19	1416	24.8	10.5	42.5	4	2.48	1.1
08:05	172	Oasis 52	1	50	60	1060.4	935.3	88.2	4	79.4	Total Sperm	2	26	1971	25.8	9.3	35.9	3	2.58	0.9
08:07	177	Spirlax 10	1	45	60	376.3	262.0	69.8	3	70.1	Motile Sperm	4	2	56	59.8	49.1	82.3	4	5.98	4.9
08:07	177	Spirlax 10	1	45	60	376.3	262.0	69.8	3	70.1	Motile Sperm	4	2	56	60.8	52.7	86.7	4	6.08	5.3
08:08	178	Spirlax 11	2	45	60	1303.3	1142.3	87.7	4	87.5	Motile Sperm	2	25	1896	29.2	22.5	77.3	3	2.92	2.3
08:09	178	Spirlax 11	1	45	60	1243.8	1218.9	98	3	N/A	Total Sperm	2.5	22	1656	29.1	20.9	71.7	3	2.91	2.1
08:10	179	Toledo 10	1	45	60	669.3	446.1	66.7	3	64.8	Total Sperm	2.5	11	776	31.6	11.3	35.8	2	3.16	1.1
08:11	183	Toledo 14	1	150	0	1078.2	964.4	89.5	5	80	Motile Sperm	3	48	3690						
08:12	185	Vaudredy 2	1	150	100	348	311.9	89.7	3	80.7	Total Sperm	3	17	1110						

To view and/or print a Daily Report:

- Click on the DAILY REPORT button
- Select the report date

FEATURES: All Tables

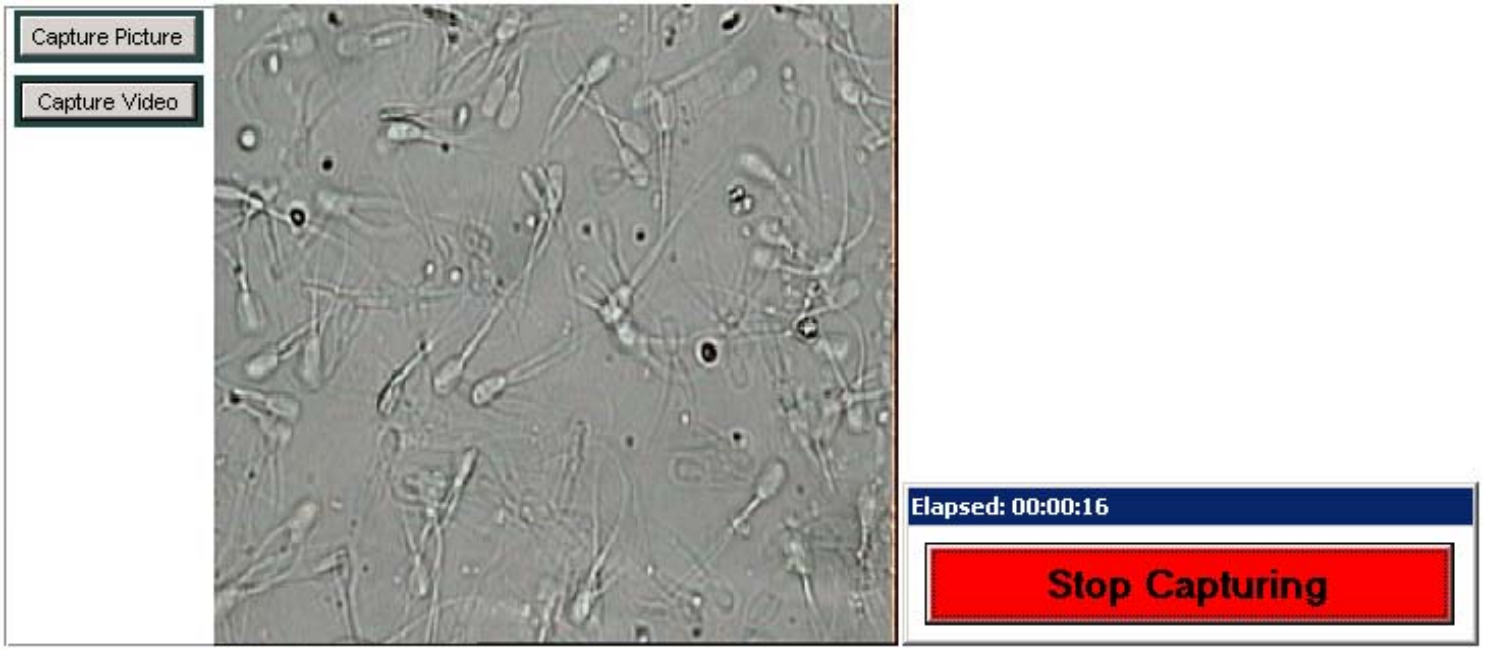
The three buttons displayed above are located at the top of the screen. To run these features data has to already be imported from the SQA-Vp into P-Sperm! Click on these buttons to:

- **Activate the REAL TIME video screen, save and attach images to boar records**
- **Send P-Sperm data to another database or external file in Excel format**
- **Run a test report**

FEATURE: Save Images

To save an image to a test record:

- Insert a slide in the visualization chamber of the SQA-Vp
- In P-Sperm - Highlight the record to attach the clip
- Click: CAPTURE IMAGE to activate the video screen
- Click CAPTURE PICTURE/VIDEO - A camera or video icon will now appear adjacent to the record in the data spreadsheet



FEATURES: Report

To view and/or print a semen analysis report:

- Select the desired records from the Dosing-Fresh or QC-Extended screens
- Click the report button 

- Click the printer icon to print a copy of the report 

SQA-Vp

Dosing Test Report

Report Date: 22/02/2007 22:51:10

< >	Sample Data									Test Results							Dosing Results		
	Date	Time	Time from Collect. <30 min.	Boar ID	Boar Name	Sample #	Neat Ejac. Vol. [ml]	Primary Extend. Vol. [ml]	Agglut. [%]	Sperm Conc. [M/ml]	MSC [M/ml]	Motility [%]	Motility Grading [0-5]	Morph. [%]	Totals per Ejaculate		Number of Doses [#]	Extender Volume [ml]	Total Volume [ml]
															Sperm # [Bil]	Motile Sperm # [Bil]			
< >	23/08/2006	09:22	No	190	Vandredy 7	2	50	60	21	1003	906.2	90.4	4	87.6 [A]	50.15	45.31	12	851	961
< >	23/08/2006	09:21	No	190	Vandredy 7	1	50	60	16	1005.8	909.7	90.5	4	87.7 [A]	50.29	45.49	12	851	961
< >	23/08/2006	09:20	No	189	Vandredy 6	2	100	100	9	349.6	189.3	54.2	2	64.2 [A]	34.96	18.93	12	761	961
< >	23/08/2006	09:19	No	189	Vandredy 6	1	100	100	30	354.7	190.8	53.8	2	69.5 [A]	35.47	19.08	12	761	961
< >	23/08/2006	09:17	No	186	Vandredy 3	1	50	100	21	1127.6	1101.7	97.7	3	87.3 [A]	56.38	55.08	18	1291	1441
< >	23/08/2006	09:16	No	184	Vandredy 1	2	150	100	8	388.4	304.1	78.3	4	69.9 [A]	58.26	45.62	15	950	1200
< >	23/08/2006	09:15	No	184	Vandredy 1	1	150	100	9	399	285.5	71.6	4	62.9 [A]	59.85	42.82	14	870	1120
< >	23/08/2006	09:14	No	182	Toledo 13	1	200	100	11	442.6	320.6	72.5	4	77.8 [A]	88.51	64.13	21	1380	1680
	23/08/2006	09:13	No	181	Toledo 12	1	60	60	25	723.3	699.7	96.8	4	85 [M]	43.4	41.98	14	1001	1121
	23/08/2006	09:12	No	181	Toledo 12	2	60	60	16	732.7	700.0	95.6	3	82 [M]	43.96	42.0	14	1001	1121
< >	23/08/2006	09:11	No	180	Toledo 11	1	50	60	29	1024.5	1006.0	98.2	4	87.7 [A]	51.22	50.3	22	1651	1761

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CONTROLS

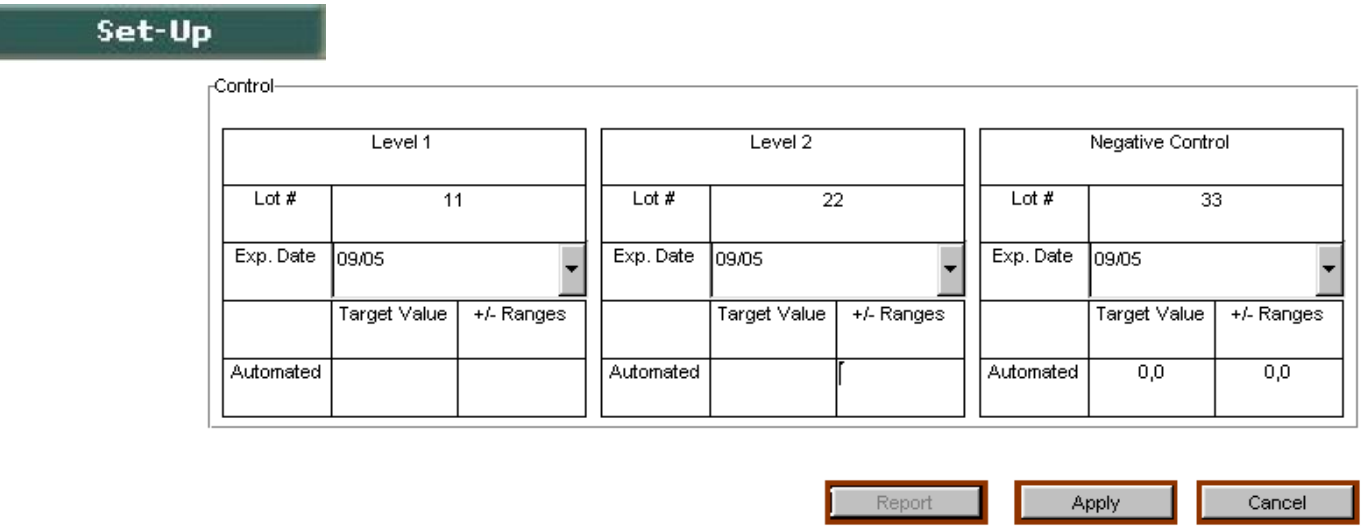
- The second navigation button is CONTROLS.
- The SQA-Vp runs Qwik-Check™ LATEX BEADS as an external control material to validate the concentration parameters of the system.
- In order to run these tests, defaults must be set-up in P-Sperm.
- The test results will then be archived and can be viewed in P-Sperm.

Controls: Overview

Two buttons are available after clicking on CONTROLS:

- **Set-up: CONTROL default settings must be set-up prior to running Qwik-Check™ beads on the SQA-Vp. Click this button to activate the CONTROLS SET-UP screen.**
- **Test Results: Click this button and the CONTROL TEST RESULTS spreadsheet will be displayed.**

Controls: Set-up Screen



To set-up the CONTROLS defaults:

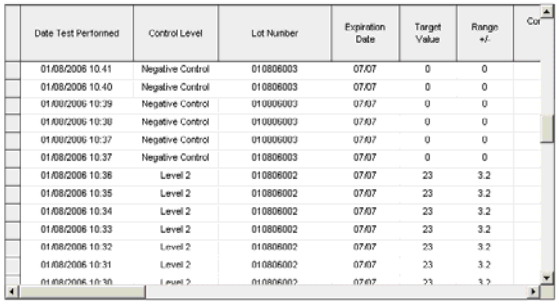
- From the SQA-Vp MAIN MENU select: SERVICE > SERVICE DATA
- In P-Sperm select: CONTROLS>Set-Up
- From the information on the QwikCheck beads box, enter the default settings for each level of CONTROLS:
  - Lot Number
  - Expiration Date
  - Target value and + / - Range
- Click APPLY to enter this information

Controls: Test Results Report

To view the Control Test Results Report, click the TEST RESULTS button:

- **Select the records to be displayed in the report from the CONTROL screen**

- **Click the REPORT button and the Control Test Results along with a Graph will be displayed for viewing and/or printing.**



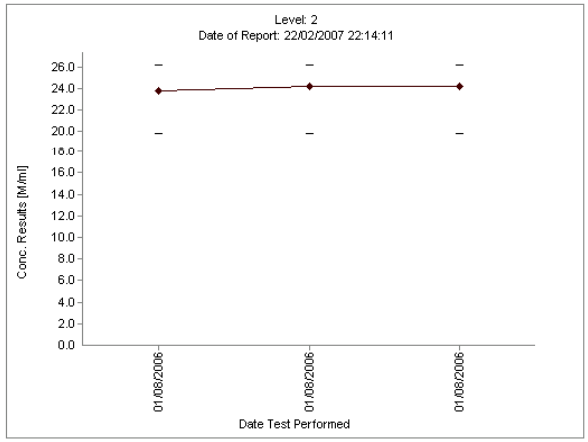
Date Test Performed	Control Level	Lot Number	Expiration Date	Target Value	Range +/-	Cor
01/08/2006 10:41	Negative Control	010806003	07/07	0	0	
01/08/2006 10:40	Negative Control	010806003	07/07	0	0	
01/08/2006 10:39	Negative Control	010806003	07/07	0	0	
01/08/2006 10:38	Negative Control	010806003	07/07	0	0	
01/08/2006 10:37	Negative Control	010806003	07/07	0	0	
01/08/2006 10:37	Negative Control	010806003	07/07	0	0	
01/08/2006 10:36	Level 2	010806002	07/07	23	3.2	
01/08/2006 10:35	Level 2	010806002	07/07	23	3.2	
01/08/2006 10:34	Level 2	010806002	07/07	23	3.2	
01/08/2006 10:33	Level 2	010806002	07/07	23	3.2	
01/08/2006 10:32	Level 2	010806002	07/07	23	3.2	
01/08/2006 10:31	Level 2	010806002	07/07	23	3.2	
01/08/2006 10:30	Level 2	010806002	07/07	23	3.2	

SQA-Vp Control Test Results

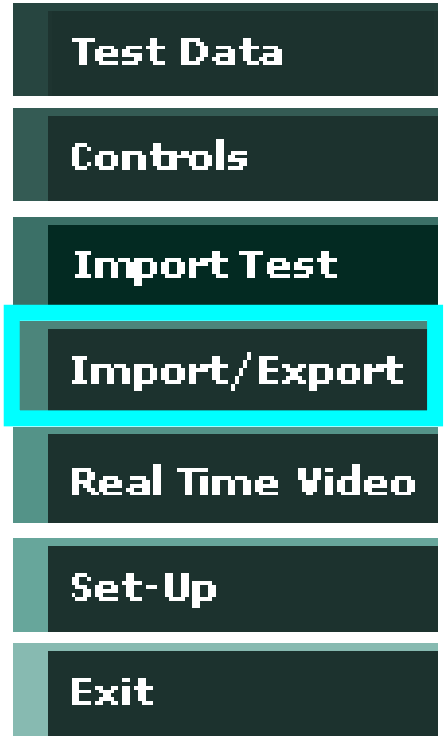
Level: 2

Date of Report: 22/02/2007 22:14:11

Date Test Performed	Control Level	Lot Number	Exp. Date	Concentration			In Range	Out of Range	Unit #
				Target Value	Range +/-	Conc. Results [M/ml]			
01/08/2006 10:36	Level 2	010806002	07/07	23	3.2	24.2	Normal		122
01/08/2006 10:35	Level 2	010806002	07/07	23	3.2	24.2	Normal		122
01/08/2006 10:34	Level 2	010806002	07/07	23	3.2	23.8	Normal		122



Import



Test results need to be sent from the SQA-Vp to P-Sperm. Use the IMPORT/EXPORT button of the Main Menu and follow the instructions below:

- **Connect the SQA-Vp to the PC running P-Sperm via the RS232 communication cable**
- **From the SQA-Vp MAIN MENU select: SERVICE > SERVICE DATA**
- **Click the IMPORT/EXPORT navigation button**
- **Select: IMPORT (TEST RESULTS or CONTROLS) > CONTINUE**
- **The SQA-Vp archive will be transferred to the P-Sperm**

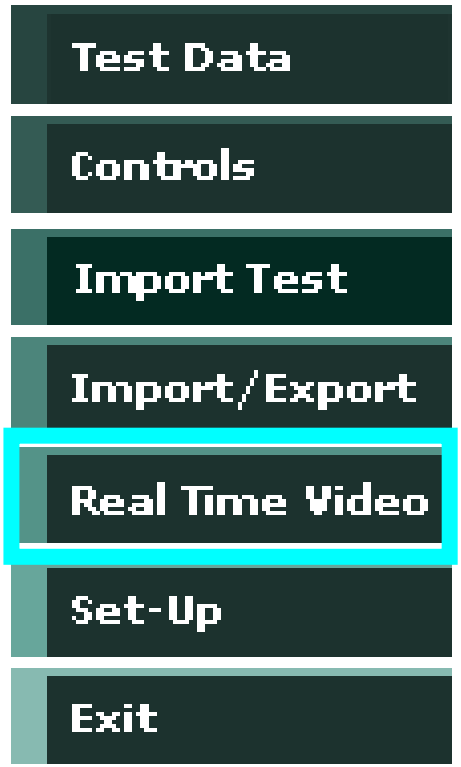
Export

Export

Select this option to send data from P-Sperm to an external file. This feature requires Microsoft Excel:

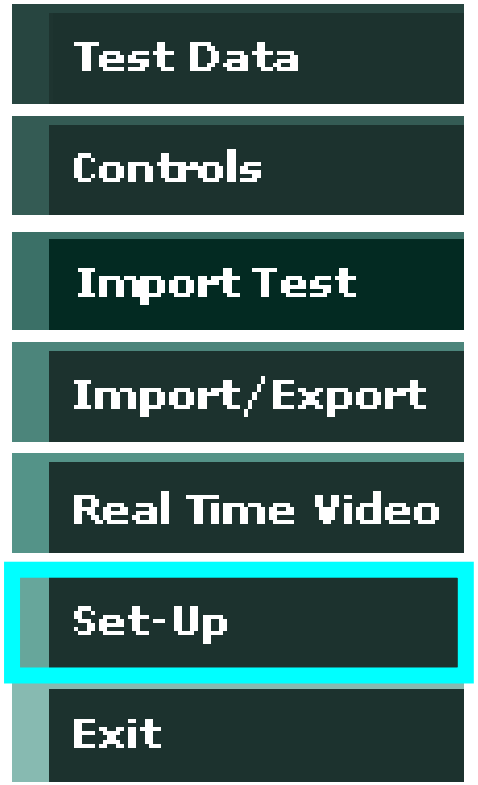
- **Click the IMPORT/EXPORT button**
- **Select EXPORT > TEST RESULTS (or CONTROLS)**
- **Enter a path and file name; then click SAVE**
- **The data will be saved to the designated location**

Real Time Video: Settings



- **Select the REAL TIME VIDEO button to view samples on the PC.**
- **Click the REAL TIME VIDEO sub-button to:**
  - **Display a counting grid**
  - **Maximize the video screen size**
  - **Copy/save images to external files**
- **Video defaults such as grid line width and color can be set-up by clicking on the REAL TIME VIDEO button and then clicking the VIDEO SETTINGS button.**

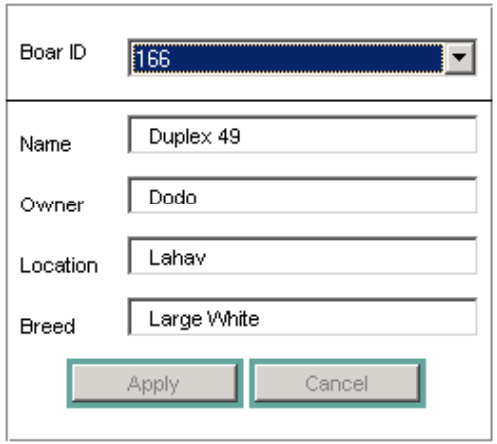
Set-up



- **Click the SET-UP button to enter all the required testing information and system defaults before testing samples in the SQA-Vp.**
- **Two buttons are displayed after clicking the SET-UP button:**
  - **Data Settings**
  - **System Settings**
- **Click the *Data Settings* to get:**
  - **Boar Settings**
  - **Normal Ranges**
- **Click the *System Settings* to get**
  - **Language**
  - **Password**
  - **Port**

Set-up: Data Settings

- **Click the *Boar Settings* button to set up Boar ID, Name, Owner, Location and Breed information**



- **Click the *Normal Ranges* button to set-up the testing range defaults for FRESH and Extended semen**

Normal Ranges ← BACK

Fresh Semen Ranges

Parameter	Normal Range	Select
Neat Ejaculate Volume [ml]	50 - 500	
Sperm Conc. [M/ml]	150 - 750	
MSC [M/ml]	100 - 750	
Motility [%]	70 - 100	
Motility Grading [0-5]	3 - 5	
Morphology [%]	80 - 100	
Sperm # [Bil]	20 - 120	
Motile Sperm # [Bil]	14 - 120	

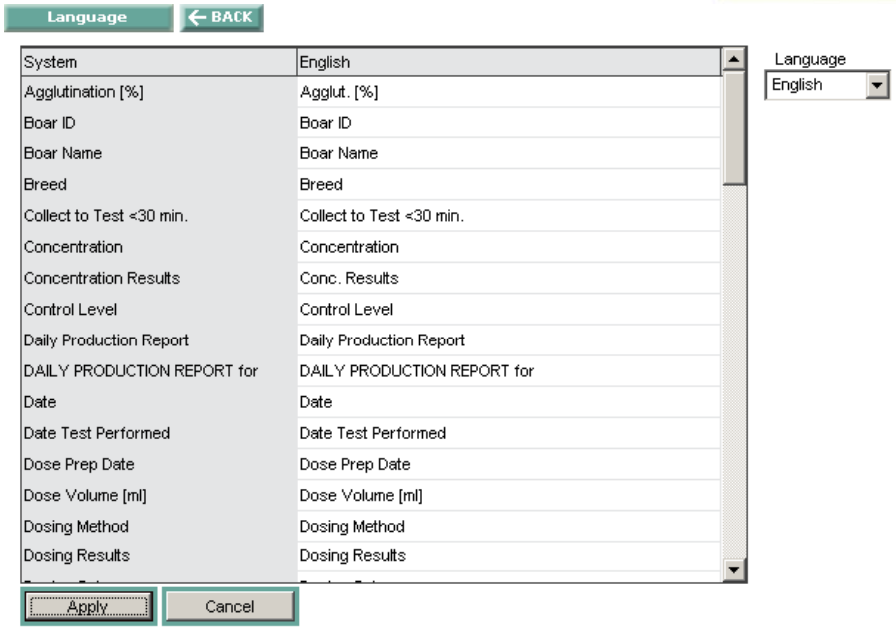
Extended Semen Ranges (doses)

Parameter	Normal Range	Select
Sperm Conc. [M/ml]	20 - 40	
MSC [M/ml]	14 - 40	
Motility [%]	70 - 100	
Motility Grading [0-5]	3 - 5	
Sperm # [Bil]	2 - 3	
Motile Sperm # [Bil]	1.4 - 3	

Set-up: System Settings

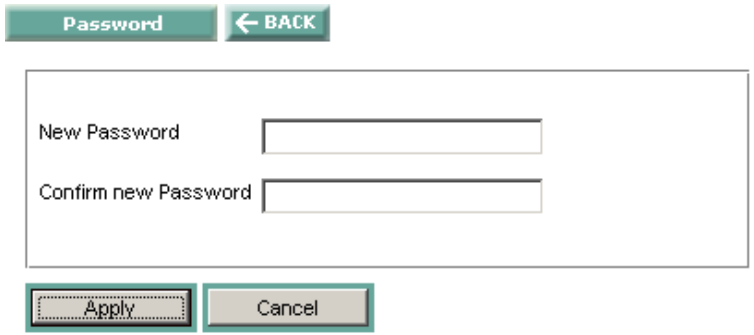
Language

- **Click the LANGUAGE button to display the set-up screen**
- **Choose “OTHER” from the drop-down menu**
- **Edit the table as desired and click APPLY**



Password

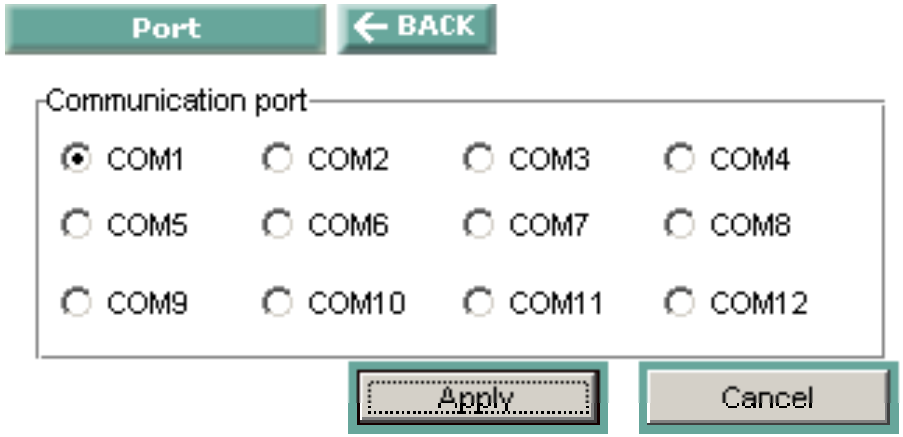
Click on PASSWORD to change it for user security



Set-up: System Settings

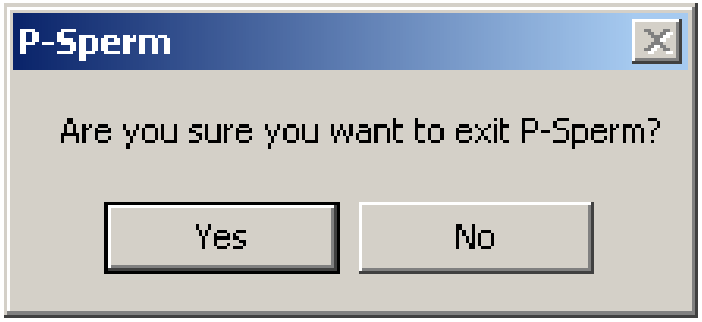
Port

Click the PORT button to set the communication port for the PC



Exit

- **Click the EXIT button to close the P-Sperm program**
- **Confirm with a click**



Thank you

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**

HUMAN SPERM QUALITY ANALYZERS

SQA-V

SQA II CP

Medical Electronic Systems

ANIMAL SPERM QUALITY ANALYZERS

SQA-Vt
TURKEY

SQA-Vp
PIG

SQA-Vb
BULL

Medical Electronic Systems

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

Medical Electronic Systems

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

Medical Electronic Systems

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

Medical Electronic Systems

SQA-V Advantages

- **Results in less than one minute**
- **Fully automated**
- **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**

Medical Electronic Systems

The SQA Vp: Overview

Applications for testing pig semen:

- **Artificial Insemination: For AI dosing and QC - In conjunction with P-Sperm software:**
  - **Fresh samples can be tested and dosing calculations performed based on total, motile or Morphologically Normal sperm per AI dose**
  - **Extended semen samples can be evaluated for quality after production and prior to insemination**

Medical Electronic Systems

SQA-Vp: System Components

- **SQA-Vp**
- **P-Sperm Data Management Software**
- **SQA-Vp Start-up Kit**
- **Test Kit with I-button and 50 testing capillaries (500 tests)**
- **Cleaning Kit**
- **QwikCheck™-beads for QC**

Medical Electronic Systems

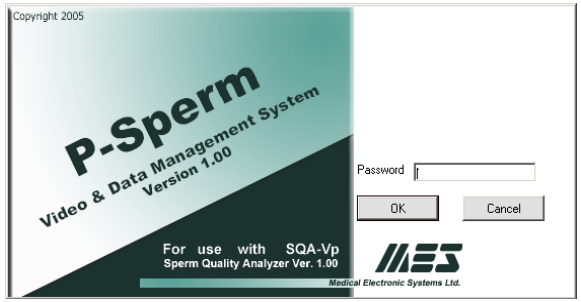
SQA-Vp Components

Disposable testing capillary (10 uses)

Diluent dispenser and pipette

SQA-V (Vb) Cleaning Kit

QC Beads



Data management software

SQA-Vp Overview

- **The SQA-Vp automatically measures the following parameters in less than 1 minute:**

Semen Parameters	
Concentration M/ml (TSC)	Morphology (% Normal)
Motile Sperm Concentration (MSC)	Total # Sperm/Ejaculate
Motility %	Total #Motile Sperm/Ejaculate (FRESH samples)
Motility Grading (0-5)	Total #Motile Sperm/Semen Volume (Extended samples)

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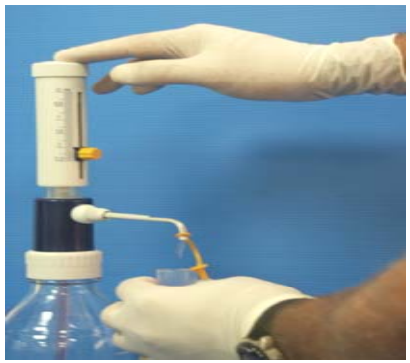
Running FRESH Samples for DOSING

Medical Electronic Systems

Preparing AI Doses from FRESH Samples

STEP #1



Dispense 2ml pre-heated extender into plastic containers

STEP # 2

Aspirate warmed semen based on SQA-Vp instructions

STEP #3

Mix the semen sample and the extender

STEP # 4

Aspirate the sample into the pre-warmed testing capillary

SQA-Vp TESTING SCREENS

ENTER SAMPLE DATA: **FRESH**

DATE 10/01/07	TIME 10:30:17
BOAR ID 2356478	SAMPLE # 325481
NEAT EJACULATE VOLUME	100 ml
PRIMARY EXTENDER VOLUME	100 ml
TIME FROM COLLECTION < 30 MIN	YES/NO
AGGLUTINATION (VISUAL INPUT)	25 %

PRESS ENTER TO CONTINUE

FRESH SAMPLE PREPARATION

1. SEMEN: 200 microliters
2. EXTENDER: 2.0 ml
3. MIX SAMPLE THOROUGHLY
4. FILL AND CLEAN CAPILLARY

INSERT CAPILLARY INTO CHAMBER

Medical Electronic Systems

Testing FRESH samples and Dosing

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

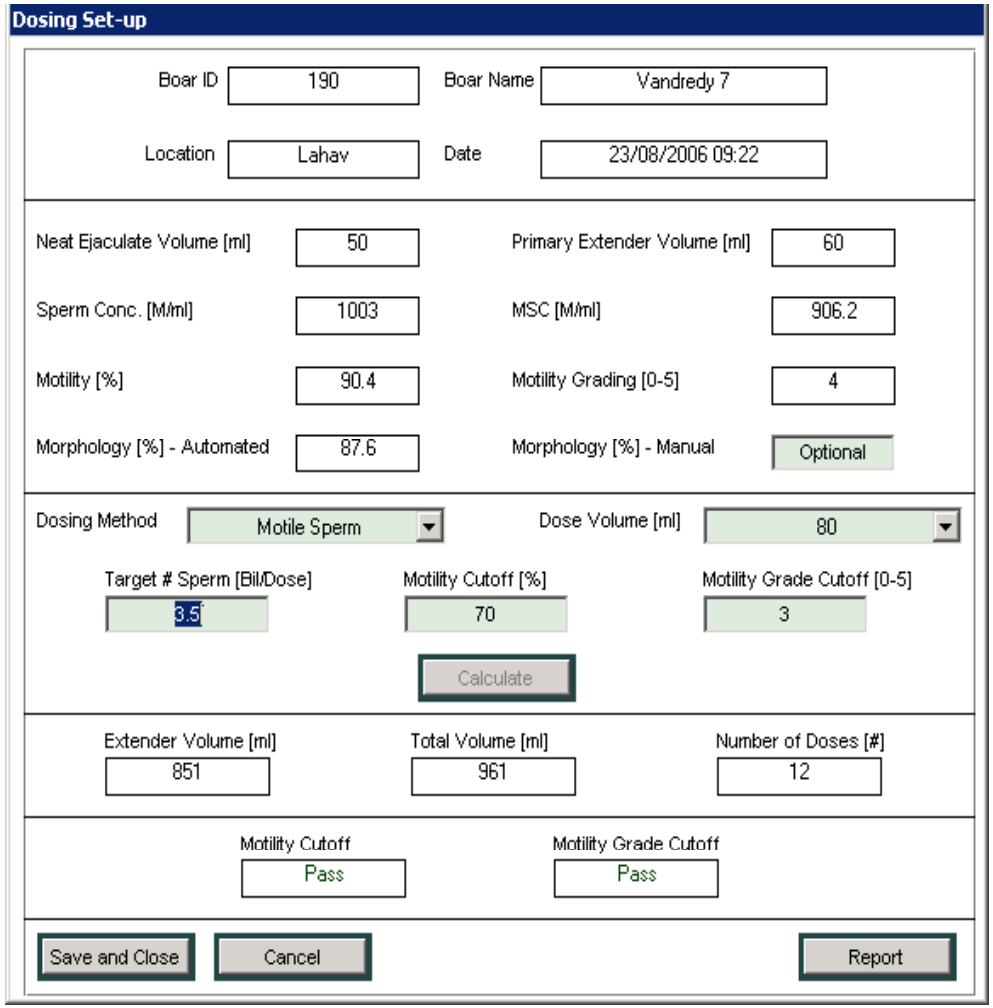
TEST RESULTS: FRESH SAMPLE

CONC. 700.6 M/ml MSC 550.1M/ml
MOTILITY 78.5 % MOTILITY GRADING 4
MORPHOLOGY 55.3 %

TOTALS PER EJACULATE

SPERM # 70.1 Bil MOT. SPERM 55.0 Bil

FOR DOSING CALCULATION
PRESS: "IMPORT ON-LINE" BUTTON
IN P-SPERM



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P-Sperm Dosing Report

Dosing - Fresh

Number of Records 59

Sort | Hide | Freeze Columns | View All

		< >	!			Date	Time	Time from Collect. <30 min.	Boar ID	Boar Name	Sample #	Neat Ejaculate Volume [ml]
▶		< >				23/08/2006	09:22	No	190	Vandredy 7	2	50
		< >				23/08/2006	09:21	No	190	Vandredy 7	1	50
		< >				23/08/2006	09:20	No	189	Vandredy 6	2	100
		< >				23/08/2006	09:19	No	189	Vandredy 6	1	100
		< >				23/08/2006	09:17	No	186	Vandredy 3	1	50
		< >				23/08/2006	09:16	No	184	Vandredy 1	2	150
		< >				23/08/2006	09:15	No	184	Vandredy 1	1	150
		< >				23/08/2006	09:14	No	182	Toledo 13	1	200
						23/08/2006	09:13	No	181	Toledo 12	1	60
						23/08/2006	09:12	No	181	Toledo 12	2	60
		< >				23/08/2006	09:11	No	180	Toledo 11	1	50
		< >				23/08/2006	09:10	No	180	Toledo 11	2	50

Clear All | Select All | Delete | Dosing Set-up

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Running Extended Samples for QC

Extended semen samples can be evaluated for quality after production and prior to insemination

Semen Parameters: Extended Samples	
Concentration M/ml	Motility Grading (1-4)
Motile Sperm Concentration M/ml	Total # Sperm/Ejaculate
Motility %	Total Motile # Sperm/Ejaculate

Medical Electronic Systems

QC – Extended Report

QC - Extended

Number of Records 40

Sort | Hide | Freeze Columns | View All

		< >			Date	Time	Boar ID	Boar Name	Sample #	Dose Prep. Date	Semen Volume [ml]	Aggluti [%
▶		< >			23/08/2006	09:26	189	Vandredy 6	2	23/08/2006	100	2
		< >			23/08/2006	09:25	189	Vandredy 6	1	23/08/2006	100	3
		< >			23/08/2006	09:24	190	Vandredy 7	2	23/08/2006	100	2
		< >			23/08/2006	09:23	190	Vandredy 7	1	23/08/2006	100	2
		< >			22/08/2006	08:26	185	Vandredy 2	1	22/08/2006	100	1
		< >			22/08/2006	08:25	185	Vandredy 2	1	22/08/2006	100	8
					22/08/2006	08:24	178	Sphinx 11	1	22/08/2006	100	9
					22/08/2006	08:23	178	Sphinx 11	2	22/08/2006	100	3
		< >			22/08/2006	08:22	166	Duplex 49	1	22/08/2006	100	2
		< >			22/08/2006	08:21	166	Duplex 49	1	22/08/2006	100	7
		< >			22/08/2006	08:17	179	Toledo 10	1	22/08/2006	100	2
		< >			22/08/2006	08:16	177	Sphinx 10	1	22/08/2006	100	1

Clear All | Select All | Delete

Medical Electronic Systems

B-Sperm Software

- **P-Sperm software comes with each SQA-Vp and can:**
  - **Manage and save boar data to the PC**
  - **Provide on-line dosing calculations**
  - **Visualize specimens on the PC screen**
- **In the Dosing FRESH mode the user can:**
  - **View test results and analyze boar test results**
  - **Set-up the calculations for AI dose preparation**
  - **Capture sperm images or videos and attach to individual boar records**
  - **View reports of testing and sort by a variety of parameters to identify trends or analyze data**
- **In the QC/EXTENDED mode the user can:**
  - **Quickly assess the quality of the AI dose prior to insemination**

Daily Production Report

SQA-Vp

DAILY PRODUCTION REPORT for 22/08/2006

Sample Data						Fresh Semen Parameters					Dosing Set-up		Dosing Results		Extended Sample Test Results					
Time	Boar ID	Boar Name	Sample #	Neat Ejac. Vol. [ml]	Primary Extend. Vol. [ml]	Sperm Conc. [M/ml]	MSC [M/ml]	Motility [%]	Motility Grading [0-5]	Morph. [%]	Dosing Method	Target # Sperm [Bil/Dose]	Number of Doses [#]	Extender Volume [ml]	Sperm Conc. [M/ml]	MSC [M/ml]	Motility [%]	Motility Grading [0-5]	Totals per Semen Volume	
																			Sperm # [Bil]	Motile Sperm # [Bil]
08:01	166	Duplex 49	1	50	60	864.9	782.7	90.5	4	87.7	Total Sperm	1.5	28	2691	15.5	8.7	56.1	2	1.55	0.9
08:01	166	Duplex 49	1	50	60	864.9	782.7	90.5	4	87.7	Total Sperm	1.5	28	2691	16.2	9.3	57.3	2	1.62	0.9
08:02	168	Duplex 51	2	80	40	1266.9	1023.0	80.8	4	72.4	Motile Sperm	2	40	3080						
08:03	170	Oasis 51	1	45	60	881.6	800.4	90.8	5	88.0	Total Sperm	2	19	1416	24.8	10.5	42.5	4	2.48	1.1
08:05	172	Oasis 52	1	50	60	1060.4	935.3	88.2	4	79.4	Total Sperm	2	26	1971	25.8	9.3	35.9	3	2.58	0.9
08:07	177	Sphinx 10	1	45	60	375.3	262.0	69.8	3	70.1	Motile Sperm	4	2	56	59.8	49.1	82.3	4	5.98	4.9
08:07	177	Sphinx 10	1	45	60	375.3	262.0	69.8	3	70.1	Motile Sperm	4	2	56	60.8	52.7	86.7	4	6.08	5.3
08:08	178	Sphinx 11	2	45	60	1303.3	1142.3	87.7	4	87.5	Motile Sperm	2	25	1896	29.2	22.5	77.3	3	2.92	2.3
08:09	178	Sphinx 11	1	45	60	1243.8	1218.9	98	3	N/A	Total Sperm	2.5	22	1656	29.1	20.9	71.7	3	2.91	2.1
08:10	179	Toledo 10	1	45	60	669.3	446.1	66.7	3	64.8	Total Sperm	2.5	11	776	31.6	11.3	35.8	2	3.16	1.1
08:11	183	Toledo 14	1	150	0	1078.2	964.4	89.5	5	80	Motile Sperm	3	48	3690						
08:12	185	Valadredy/2	1	150	100	348	311.9	89.7	3	80.7	Total Sperm	3	17	1110						

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SQA-Vp Technology and Performance Data

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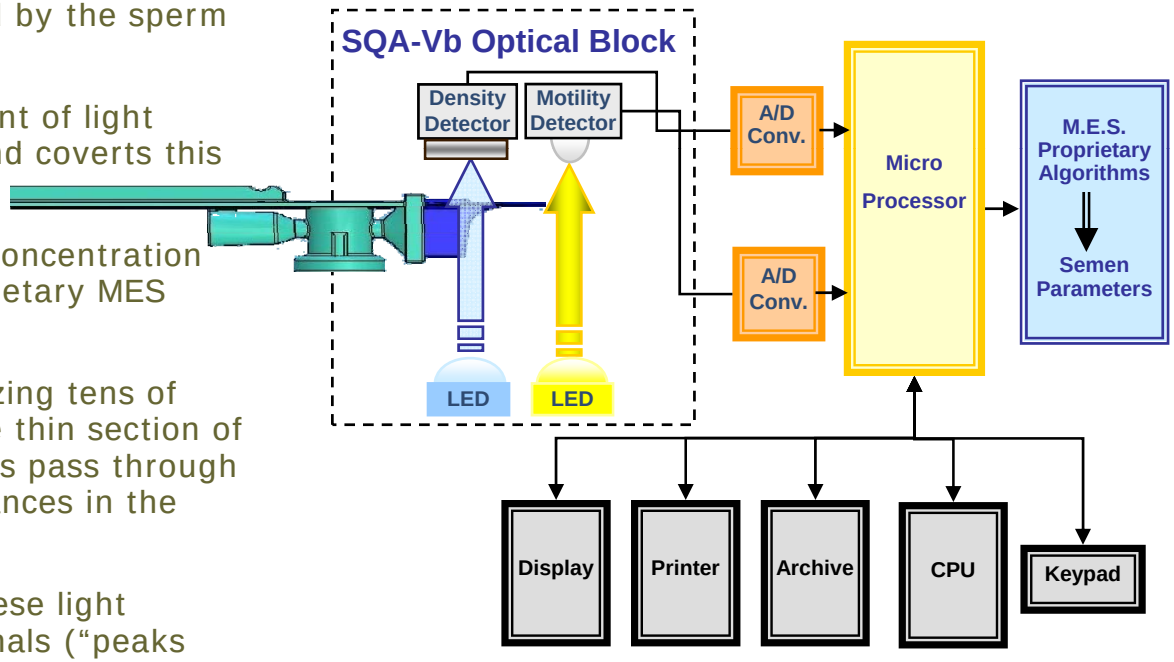
SQA-Vb Technology

- **The SQA-Vp testing capillary is inserted into the optical block and testing begins.**
- **Concentration** is measured by analyzing millions of sperm cells in the thick section of the SQA-V testing capillary: A very specific wavelength of light is absorbed by the sperm cells.
- A detector measures the amount of light absorbed by the sperm cells and coverts this value to optical density (OD).
- "OD" is translated into sperm concentration by a microprocessor and proprietary MES algorithms.
- **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 these light disturbances into electrical signals ("peaks and valleys") and transmits them to a converter which translates them into digital form.
- These electronic signals are analyzed by the SQA software and proprietary algorithms and translated into sperm motility parameters.



SQA-Vp: Dynamic Range

SQA-Vp Dynamic Range for FRESH and EXTENDED Boar Semen

Sample Type	Conc. M/ml	Motility %	Grading Motility	Morphology
Fresh	0-1500	0-100	0-5	0-100
Extended	0-500	0-100	0-5	-

Medical Electronic Systems

SQA-Vp: Performance Claims

FRESH BOAR SEMEN			
Claims	**Conc. M/ml**	**Motility %**	**Morphology**
Precision (CV, %)	**2.1%**	**4.0%**	**7%**
Accuracy (correlation to manual data)	**0.99**	**0.83**	**0.71**
Repeatability (QC material)			
Intra-device Variability (CV, %)	**≤ 0.01**	**Inter-device Variability (CV, %)**	**≤ 2.5**

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SQA-Vp
Comparison to CASA

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SQA-Vp vs. CASA

Comparison Table: SQA-Vb vs. CASA		
Parameter	**SQA-Vp**	**CASA**
Sample volume for testing	100 µl – Fresh semen 20 µl – QC/Extended semen	5-10 µl
# Spermatozoa tested	Concentration channel: Millions Motility channel: Thousands	200-400 cells (setting dependent)
Dilution rate	Constant	Variable depending on sample quality
Automation	Full	Partial (a lot of settings and adjustments)
Accuracy (correlation to manual method)	Concentration: 0.99 Motility: 0.83	Inconsistent
Precision (CV, %)	Concentration: 2.1% Motility: 4.0%	
Repeatability using QC material (CV, %)	Intra-device ≤ 0.01 Inter-device ≤ 2.5	

The SQA Vb: Summary

SQA-Vp: Automated test results in less than one minute!

- **FRESH/Dosing - In conjunction with B-Sperm software:**
  - **Fresh samples can be tested and dosing calculations performed based on total, motile or morphologically normal sperm concentration**
- **QC/Extended semen samples can be evaluated for quality prior to insemination**

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SQA-Vp

NEW TECHNOLOGY

in the Pig Industry