



# **P-Sperm™ & SQA-Vp Integrated PIG System**

## **User Guide**

Catalog # 5111

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## Section 1: Overview

The SQA-Vp and P-Sperm™ boar management software work together to provide an integrated PIG System (IPS) for boar semen analysis, AI Dosing, extended semen QC and many other functions related to pig reproduction.

**FRESH** or **EXTENDED** samples are prepared and aspirated into a multi-use, washable testing capillary. The capillary is inserted into the measurement compartment of the SQA-Vp where state-of-the-art technology in electro-optics, computer algorithms and video microscopy produce rapid, accurate and precise analysis of Fresh/Extended boar semen. Samples can be viewed using the on-board video visualization system with magnification capabilities of X300 through X500.

All sample data entry and boar/dosing reports are handled in the PC-based P-Sperm boar management software that operates together with the SQA-Vp as an integrated system. The following functions and features are listed below:

- Rapid data entry utilizing drop down menus that are updated during the testing process or from pre-set tables.
- Fast test results - under a minute to report all semen parameters. Perfect for high throughput industrial boar facilities.
- Easy to use QwikClick feature for counting droplets or assessing detailed morphology defects.
- Automated semen dosing calculation based on single-sire, split or pooled samples.
- Semen dosing reports and data analysis.
- Numeric and graphical Boar information/reports.
- Boar semen samples can be viewed on a large PC screen (video or image) and images can be captured and stored with individual boar records.
- Report options: Fresh Samples, Extended Samples, Daily Production, Morphology (differential), Pooled Batches, Remaining Semen, Individual Boar information.

## Section 2: SQA-Vp Overview

### SQA-Vp





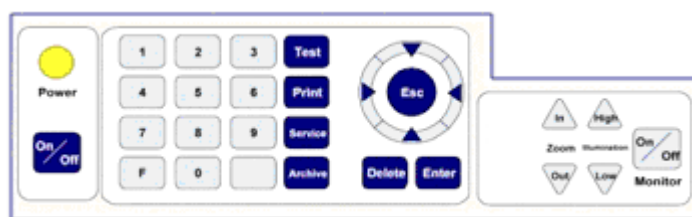
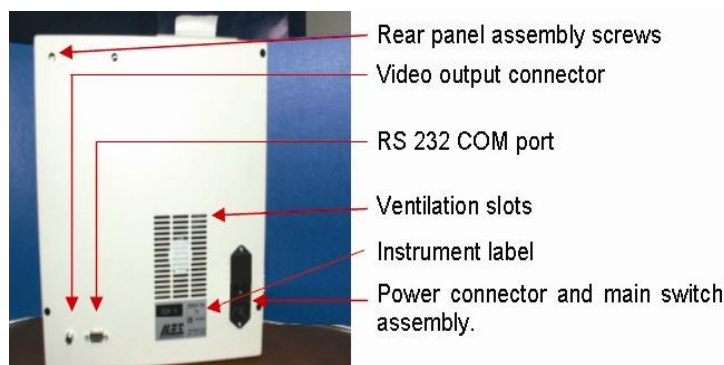
## The Rear/Side Panel



## I-button

## Keypad and Navigation

The Rear Panel components are as follows:

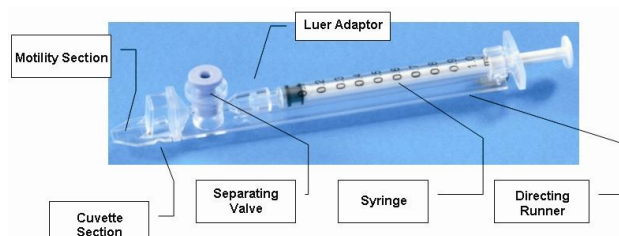


The SQA-Vp front panel Keypad is used for navigation of the SQA-Vp:

- Service Key = Opens the Service Menu.
- ARROW keys = To move within the Service Menu screen.
- ENTER = To select menu options and to move to the next screen.
- ESC = Return to a previous screen or row.
- ZOOM = Set the visualization focus
- Other keys = Calibration/verification (for manufacturer's use only)

## SQA-Vp Testing Capillary

The testing capillary consists of the following parts:



- Plastic, multi-use (animal use only), disposable.
- Can be used in either the SQA-Vp measurement or visualization chamber
- For capillary use/cleaning instructions, refer to the appendix section of this guide.

## Slide Adaptor



- Use a standard laboratory slide 76 x 25.6 mm and 22 x 22 mm cover-slip.
- Sample should be placed where indicated by the yellow dot.





**NOTE:** Load I-button tests and set system date **PRIOR** to testing (see **SQA-V Service Menu** section for full instructions).

### Section 3: Start-up SQA-Vp

- Turn on the main switch on the rear panel of the SQA-Vp.
- Both the power and heater light on the front panel will illuminate.
- Press the On/Off key on the SQA-Vp keypad.
- The SQA-Vp will perform self-testing and then will display the # Tests Remaining
- When ready for testing samples, the SQA-Vp will display the following message:

PLEASE ENTER SAMPLE DATA  
IN P-SPERM



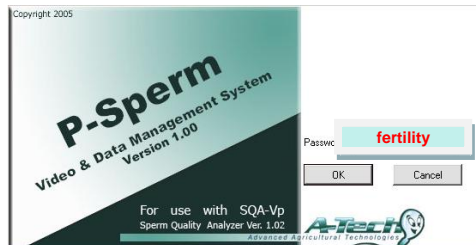
**WARNING:** remember the new password or the system cannot be re-entered.

**WARNING:** Set-up system defaults prior to using P-Sperm

### Section 4: Start-up P-Sperm

Click on the P-Sperm icon located on the PC desktop to enter the system.

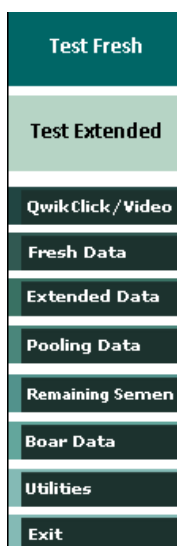
- Enter the **temporary password: fertility** and then click OK.
- A screen for changing the password will appear, enter and confirm a new password.



### Section 5: P-Sperm Navigation Overview

Click one of TEN P-Sperm buttons to activate the features described below:

Ten navigation buttons allow easy access to the P-Sperm features.



- **TEST FRESH:** Click to begin testing FRESH BOAR SEMEN.
- **TEST EXTENDED:** Click to begin testing EXTENDED BOAR SEMEN.
- **QwikClick/VIDEO:** Click to view samples on the PC and to activate the QwikClick droplet assessment or morphology counter.
- **FRESH DATA:** Click to activate a grid that displays FRESH boar semen information such as test results, dosing settings, graphs, semen images/videos.
- **EXTENDED DATA:** Click to activate a grid that displays information EXTENDED boar semen information such as test results, graphs, semen images/videos.
- **POOLING DATA:** Click to display a grid containing information on Pooled Batches of semen such as batch data, test results, dosing settings/outcomes.
- **REMAINING SEMEN:** Click to display a grid that containing information on semen that remains after pooling or dosing including boar and sample data, extender name/type, test results, etc.
- **BOAR DATA:** Click to activate a grid displaying information on individual boars such as Boar Name and ID, Breed, averages of semen test results, single sire data, split and pooled dosing for a given boar over a selected timeframe and extended semen QC results (linked to the fresh sample used for AI dosing).
- **UTILITIES:** This menu contains Set-up, Controls and SQA-V Self-Test data.
- **EXIT:** Click to close P-Sperm.



## Section 6: Sample Testing

- Before testing for the first time or in the event of a change...update the default settings in P-Sperm (Please refer to the Utilities>Set-up section). Enter all boars into the boar table (Utilities>Set-Up>Data Settings>Boar Settings).
- Turn on both the SQA-Vp and P-Sperm to begin testing boar semen.

### Test Fresh

**Test FRESH:** Click this button to begin testing FRESH samples. The screen below will be displayed:

Test Fresh

Test Fresh ← BACK

Boar Name	<input type="text"/>	Morphology Testing Cycle	QwikClick Assessment (Frequency):	Morphology: # Tests to Avg.
Boar ID	<input type="text"/>			
Sample #	1	QwikClick Today?		
Neat Ejaculate Volume [ml]	<input type="text"/>	Agglutination [%]	<input type="text"/>	
Primary Extender Volume [ml]	<input type="text"/>	Lab Tech.	<input type="text"/>	
Expected Conc. > 1 [Bil/ml]	No	Code	<input type="text"/>	
Time from Collect. <30 min.	Yes	Collector	<input type="text"/>	

Continue >>      New Boar      Cancel

### ENTER:

- BOAR NAME** and **BOAR ID** - a drop-down menu will display the complete list of boars that were "loaded" into the boar table. Begin typing and records will be displayed. Click on the desired record and the BOAR NAME and ID will be filled-in. Click the **NEW BOAR** button or go to Utilities>Set-Up>Data Settings>Boar Settings to enter a new boar or set-up groups of boars.
- If **Boar Name** or **ID** is not found, the following message is displayed:



- Sample #, Neat Ejaculate Volume** and **Primary Extender Volume**.
- Expected Conc > 1(Bil/ml):** Select YES if the boar produces highly concentrated semen. The default is set to NO.
- Time from Collection <30 min:** If < 30 minutes, enter YES, otherwise NO.
- Morphology Testing Cycle** and **QwikClick Today:** Information will be displayed automatically based on the default settings (Refer to Utilities>Set-up).
- Agglutination:** Can be entered by visual sample observation using the standard slide (not obligatory).
- Lab Tech., Code** and **Collector:** These are optional fields for each facility.

CLICK **CONTINUE>>** to begin testing (SQA-V waiting screen for sample testing should be activated) or **CANCEL** to cancel the test.



## FRESH SAMPLE PREPARATION AND TESTING:

### NOTE:

When preparing **FRESH** samples for testing the extender volume is always 2 milliliters.

### NOTE:

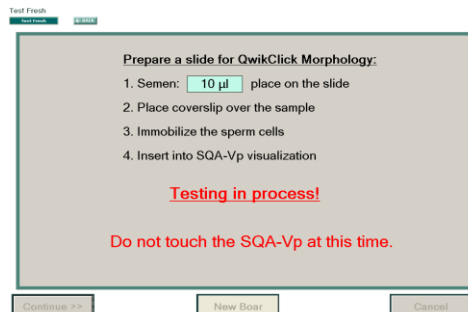
**DO NOT** pre-heat the **FRESH** sample! Only pre-heat the extender and the testing capillaries or motility will be impacted.

- After clicking the Continue>> button, the sample preparation screens below will be displayed:

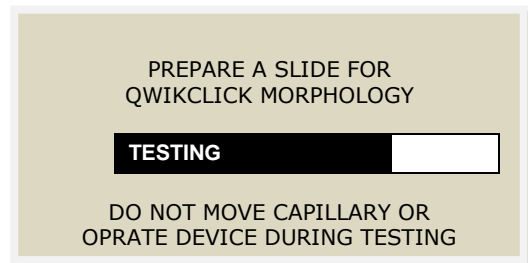


- Prepare a **FRESH** sample based on the instructions.
  - Prepare 2ml aliquots of extender pre-heated to 37°C (98.6°F).
  - Pre-heat the testing capillaries to 37°C (98.6°F).
  - DO NOT HEAT THE SAMPLE! ONLY THE EXTENDER AND CAPILLARY** or motility will be impacted!
- Follow the screen instructions and do not touch the SQA-Vp or insert a testing capillary until instructed.
- When the SQA-Vp 'beeps', insert the prepared testing capillary into the SQA-Vp when the message: **INSERT CAPILLARY INTO CHAMBER** is displayed.
- Testing will begin automatically and run for 30 seconds.
- If the QwikClick morphology is to be performed, the messages below will be displayed. Prepare the slide while the sample is being tested.

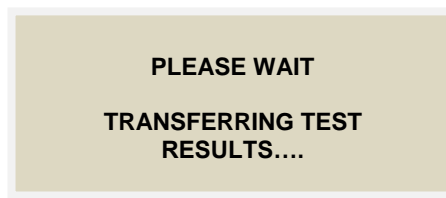
### P-Sperm



### SQA-Vp



- A "beep" will be heard when the testing is finished and the test results will automatically be transferred to P-Sperm.



- Then in the SQA-V, Remove Capillary message will be displayed.
- In P-Sperm, the QwikClick Morphology Assessment (QCA) screen will automatically be displayed if the sample requires QCA. If not, the dosing screen will be displayed.
- Once the QCA and/or dosing has been completed, the test results, dosing information and boar/sample data will be saved in the P-Sperm database.
- The Dosing Set-up Report will be displayed automatically (if this function is set) and can be printed out by clicking the Print icon.



## Test Extended

**Test EXTENDED:** Click this button in P-Sperm to begin testing an EXTENDED sample.

One of the two screens below will be displayed depending on whether the Extended sample is from a pool or not (question answered YES or NO – see below screens):

The image shows two side-by-side screenshots of the 'Test Extended' form. Both forms have a title bar 'Test Extended' and a 'CANCEL' button. The left form is for 'Is this Extended sample from a pool?' set to 'No'. It includes fields for 'Semen Volume [ml]', 'Boar Name', 'Boar ID', 'Dose Prep. Date' (set to 28/07/2011), 'Fresh Sample #' (with a 'Select' button), 'Agglutination [%]', 'Lab Tech.', and 'Code'. The right form is for 'Is this Extended sample from a pool?' set to 'Yes'. It includes fields for 'Semen Volume [ml]', 'Batch Date' (set to 28/07/2011), 'Batch ID' (with a 'Select' button), 'Agglutination [%]', and 'Code'. Both forms have 'Continue >>', 'New Boar', and 'Cancel' buttons at the bottom.

**Offline Testing:** If this box is checked, whatever is entered into a field will not be saved in the database (Extended records will not be linked to any other data).

### **Enter the following if "NO" is checked (Is this Extended sample from a pool?):**

- **BOAR NAME** and **BOAR ID** - a drop-down menu will display the complete list of boars that were "loaded" into the boar table. Begin typing and records will be displayed. Click on the desired record and the BOAR NAME and ID will be filled-in.
- **Dose Prep. Date:** Select the date the EXTENDED sample was prepared from the calendar drop-down menu.
- **Fresh Sample #:** Click Select and enter the number of the FRESH sample that was extended for either single-sire or split dosing. If multiple ejaculates were collected from the same boar on the same date, the table like the one displayed to the right will pop-up. Select the appropriate record to be linked to the Extended sample results.
- **Semen Volume:** Enter the volume of AI DOSE.
- **Agglutination:** A visual assessment of % spermatozoa agglutinated.
- **Lab Tech.** and **Code:** These are optional fields for each facility.

Link split test results to primary sa...

Date /	Time	Semen Volume [ml]	Number of Doses [#]
09/08/2011	10:01	118	6
09/08/2011	11:22	209	5

Link Cancel

### **Enter the following if "YES" is checked (Is this Extended sample from a pool?):**

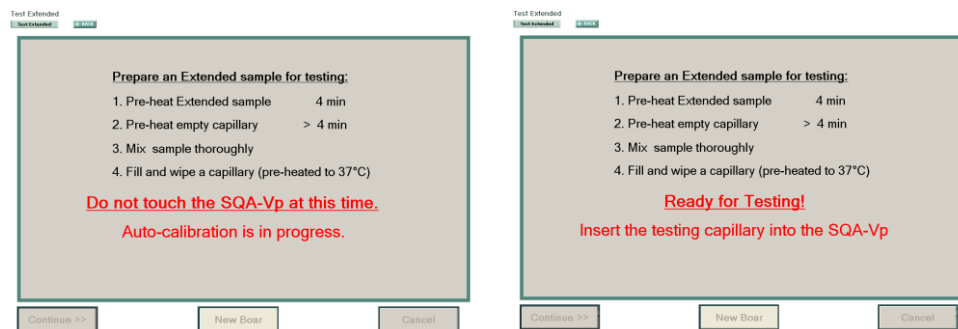
- **Batch Date:** Select the date the pooled batch was prepared from the calendar drop-down menu.
- **Batch ID:** Click Select to input the Batch ID that was extended. Only Batch ID of closed batches will be displayed. If adding AI doses to the batch is not completed, such a batch cannot be tested in Extended mode.
- **Semen Volume:** The volume of AI DOSE.
- **Agglutination:** A visual assessment of % spermatozoa agglutinated.

CLICK **CONTINUE>>** to begin testing or **CANCEL** to cancel the test.

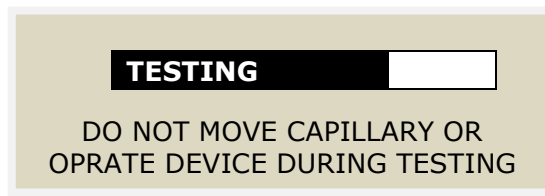


## EXTENDED SAMPLE PREPARATION AND TESTING:

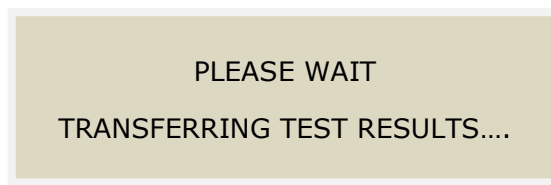
- After clicking the **Continue>>** button, the sample preparation screens below will be displayed in sequence:



- Prepare an **EXTENDED** sample for testing based on the instructions.
  - Prepare a 2ml SAMPLE pre-heated to 37°C (98.6°F) for 4 minutes.
  - Pre-heat the testing capillaries to 37°C (98.6°F).
  - DO NOT HEAT THE SAMPLE beyond 4 minutes** or it may agglutinate!
- Follow the screen instructions and do not touch the system until instructed.
- When the SQA-V 'beeps' and the message: **INSERT CAPILLARY INTO CHAMBER** is displayed, insert the testing capillary into the SQA-Vp.
- Testing will begin automatically and run for 30 seconds.



- A "beep" will be heard when the testing is finished and the test results will automatically be transferred to P-Sperm and saved in the Extended Data grid.



## Section 7: QwikClick/Video

### QwikClick/Video



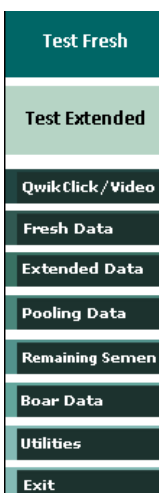
Click the **QwikClick/VIDEO** navigation button to activate the:

- QwikClick** Morphology screen for off-line morphology testing.
- Real Time Video**: View samples "live" from the SQA-Vp visualization system.
- Video Settings**: Customize the video set-up.

**Note:** The QwikClick screen is opened online automatically after the results of FRESH semen sample testing are transferred to P-Sperm.

To pre-set this feature go to: **Utilities>Set-up>System Settings> Administrator > Settings** and **Utilities>Set-up>Data Settings>Boar Settings**.

**NOTE:**  
**PRE-HEAT**  
the  
**EXTENDED**  
semen sample  
for **ONLY 4**  
**minutes** – do  
not heat for  
more or the  
sample may  
agglutinate  
and motility  
readings will  
be impacted!





QwikClick

QwikClick/Video > QwikClick

Video Settings

Grid

← BACK

**NOTE:**  
Only FRESH samples can be assessed with the on-line QwikClick feature.

This section describes how to use the P-Sperm QwikClick Droplet and QwikClick Morphology Assessment tools.

**DEFINITIONS:** The QwikClick feature has three settings for assessing porcine morphology if the fully automated option is not preferable:

- **QwikClick Droplet Assessment (QCA)**
- **QwikClick Morphology Counter (on-line)**
- **QwikClick Morphology Counter (off-line)**
- **QwikClick Droplet Assessment (QCA):** Enhance the accuracy of the SQA-Vp automated morphology by assessing % droplets and broken tails (comparable to CASA systems). The easy manual count of % droplets and broken tails are added to the automated results generating a very high level of accuracy. Set up this feature by going to: **Utilities > Set-up > Data Settings > Boar Settings**. Pre-set the frequency for testing boar QwikClick Morphology based on the desired collection cycle (every, every 2nd, 3<sup>rd</sup>... or 6<sup>th</sup> collection). This results in good boar morphology management/reporting and can increase testing throughput.
- **The AMI (Average Morphology Index) should be used with the QCA: AMI** is an average of several morphology results from the same boar. The number of morphology test results to average is determined by the operator (minimum of 1 and maximum of 6). Both the frequency and the number of tests to average for computing AMI is indicated in the Test Results table of the QwikClick screen.

Boar Name	King	Morphology Testing Cycle	QwikClick Assessment (Frequency)	Morphology # Tests to Avg.
Boar ID	6		every collection	1
Sample #	1	QwikClick Today?	Yes	
Neat Ejaculate Volume [ml]	100	Agglutination [%]	10	
Primary Extender Volume [ml]	80	Lab Tech.	I	
Expected Conc. > 1 [Bil/ml]	No	Code	*	
Time from Collect. <30 min.	Yes	Collector	m	

When using the AMI for AI dosing, please note the PASS/FAIL criteria is based on a Morphologically Normal Sperm target or cut-off set by the user. **To ensure quality, boars that have an AMI below the morphology cut-off will automatically be selected for QwikClick morphology testing, regardless of the QCA cycle.**

- **QwikClick Morphology Counter (on-line):** This morphology option should be selected if the user wants to manually assess all morphology defects. The % Normal Morphology resulting from the manual count will be used by the system for AI dosing and the sample will PASS/FAIL based on a pre-set cut-off/target.
- **QwikClick Morphology Counter (off-line):** This feature is for manually assessing morphology defects 'off-line' (without impacting dosing).

**How to SET-UP the QwikClick Droplet Assessment (QCA):**

- **SYSTEM SETTINGS** (set by administrator): Go to **Utilities > Set-up > System Settings > Administrator > Settings** and select:
  - Activate QwikClick Yes/No
  - Skip QwikClick (days of week)
  - QwikClick Setting: Droplet Assessment / Morphology Counter



QwikClick

? Activate QwikClick

Yes

? Skip QwikClick (days of week)

No

? QwikClick Setting

Droplet Assessment

Save Cancel

? Activate QwikClick

Yes

? Skip QwikClick (days of week)

Monday

? QwikClick Setting

Droplet Assessment

Save Cancel

? Activate QwikClick

Yes

? Skip QwikClick (days of week)

Droplet Assessment

? QwikClick Setting

Droplet Assessment

Save Cancel

- BOAR SETTINGS TABLE:** Go to **Utilities>SET-UP>DATA SETTINGS>BOAR SETTINGS** and enter the **QwikClick Assessment (Frequency)** and **Morphology: # Tests to Avg.** Place the cursor over the title cells for an explanation of these settings.

Set-up > Data Settings

Boar Settings

Normal Ranges

← BACK

Utilities > Set-up > Data Settings > Boar Settings

Report

Export

← BACK

Boar Name	Boar ID	Breed	Owner	Location	QwikClick Assessment (Frequency):	Morphology: # Tests to Avg.
King	2	American Yorkshire	MES	MES	every collection	1
Star	1	American Yorkshire	MES	MES	every collection	1

When a boar is scheduled for QwikClick morphology testing, the **TEST FRESH** data entry screen will automatically provide a YES or NO to the question "QwikClick Today?" The QwikClick Assessment (Frequency) and Morphology: # Tests to Avg. will also be shown:

Test Fresh

Test Fresh

← BACK

Boar Name	King	Morphology Testing Cycle	QwikClick Assessment (Frequency):	Morphology: # Tests to Avg.
Boar ID	6		every collection	1
Sample #	1	QwikClick Today?	Yes	
Neat Ejaculate Volume [ml]	100	Agglutination [%]	10	
Primary Extender Volume [ml]	80	Lab Tech.	I	
Expected Conc. > 1 [Bil/ml]	No	Code	*	
Time from Collect. <30 min.	Yes	Collector	m	



- If the QwikClick feature has been set-up as a system default and the boar is scheduled for morphology testing, one of the QwikClick Morphology Counters (depending on default setting) will be displayed when testing is finished. Make a slide and place it into the visualization compartment of the SQA-Vp.
- If the QwikClick feature is not the system default or the boar is not scheduled for morphology testing, the QwikClick screen will be skipped and the Dosing Set-up screen will be displayed automatically when a test is completed.
- The QwikClick screen below will automatically be displayed upon completing the SQA-Vp test if the boar is scheduled for QCA or the AMI (average morphology index) is below the cut-off value:

**P-Sperm Management System**  
Version 1.00

QwikClick/Video > QwikClick

Video Settings    End    ← BACK

Boar Name: King    Boar ID: 2    Test Date: 07/08/2011 16:15    Sample #: 1

Parameter	Results	Cut-off	Pass/Fail
Sperm Conc. [M/ml]	229.7	50.0	Pass
Motility [%]	98.9	70.0	Pass
Motility Grading [0-5]	5	2	Pass
Morphology [%] - A	95.0	70.0	Pass
Total Sperm [Bil]	23.0	3.0	Pass
Total Motile Sperm [Bil]	22.7	2.0	Pass
Total Morph. Norm. [Bil]	21.8	2.0	Pass
FSI [Bil]	21.0	1.5	Pass

Sample:

**QwikClick Droplet Assessment**

- F1 / Left mouse click = NO droplets or broken tails
- F2 / Right mouse click = YES droplets or broken tails

Droplets or Broken Tails?		Total Sperm	% Droplets or broken tails
No	Yes		
0	0	0	0

Clear    Exit    **Final Calculation**

Two floating tables are displayed on the QwikClick screen:

- **Automated Test Results**
- **QwikClick Droplet Assessment** OR **QwikClick Morphology Counter**


The **Automated Test Results** table seen below displays test **Results**, **Cut-off** defaults and **Pass/Fail** results. The sample will PASS if all of the semen parameters have passed the cut-offs. The sample will FAIL if one semen parameter fails.

Automated Test Results			
Parameter	Results	Cut-off	Pass/Fail
Sperm Conc. [M/ml]	229.7	50.0	Pass
Motility [%]	98.9	70.0	Pass
Motility Grading [0-5]	5	2	Pass
Morphology [%] - A	95.0	70.0	Pass
Total Sperm [Bil]	23.0	3.0	Pass
Total Motile Sperm [Bil]	22.7	2.0	Pass
Total Morph. Norm. [Bil]	21.8	2.0	Pass
FSI [Bil]	21.0	1.5	Pass
Sample <input checked="" type="button" value="Pass"/> <input type="button" value="Fail"/>			

- Cut-off criteria can be set-up by the ADMINISTRATOR (see the SET-UP section of this User Guide). If not set-up, the manufacturer default cut-offs will be used.
- The P-Sperm can be set-up to automatically or manually PASS or FAIL a sample (see the SET-UP section of this User Guide).



**QwikClick Droplet Assessment:** Enhance the accuracy of the automated morphology reported by the SQA-Vp by entering % droplets or broken tails to the algorithm.

Click  icon for explanation on how to use QwikClick Droplet Assessment:

- Prepare a slide of non-motile cells (see Appendix section for a protocol) and place it into the SQA-Vp visualization compartment.
- Focus and begin "counting" cells:
  - Use the F1/Left mouse key of a PC to count all sperm cells without droplets (The counting results are displayed online in a table).
- Use the F2/Right mouse key of a PC to count all sperm cells with DROPLETS or BROKEN TAILS (The counting results are displayed online in a table).
- Move to different fields of view by turning the silver knob of the slide holder. When enough cells have been counted, Click: FINAL CALCULATION.
- This completes the count, sends the information to the morphology algorithm and populates the test data and dosing screen with the results.
- Click **CLEAR** to remove the entire count and to start over.


**QwikClick Droplet Assessment**

- F1 / Left mouse click = NO droplets or broken tails
- F2 / Right mouse click = YES droplets or broken tails

Droplets or Broken Tails?		Total Sperm	% Droplets or broken tails
No	Yes		
0	0	0	0

**QwikClick Morphology Counter (off-line):** Manually assess all morphology defects without impacting dosing or attaching the results to a boar report:

To activate the **QwikClick Morphology Counter (OFF-LINE)**: Click **QwikClick/Video > QwikClick** buttons in P-Sperm. The counter to the right will be displayed.

To use the **QwikClick Morphology Counter** (click  icon to display instructions).

**Note:** The function keys that correspond to morphological defects are set by the manufacturer, but can be re-set by administrator in the P-Sperm set-up.

- Prepare a slide of non-motile sperm cells and place it into the SQA-Vp visualization compartment.
- Use assigned function keys (F1, F2, etc.) of a PC keyboard for counting normal cells and morphological abnormalities (one abnormality per spermatozoa).
- Move to another field of view by slightly turning the silver knob of the SQA-Vp slide holder.
- Click **FINAL CALCULATION** to save the results.

**QwikClick Morphology Counter**

Classification	# Cells	%	Keys
Normal	0	0	F1
Heads	0	0	F2
Tails	0	0	F3
Midpiece	0	0	F4
Droplets (P)	0	0	F5
Droplets (D)	0	0	F6
Other 1	0	0	F7
Other 2	0	0	F8
Total	0	0.0	

When the **FINAL CALCULATION** button is clicked and a title assigned to a simple test report, the results can be viewed in a report table and/or printed and exported to an Excel file (The results will not be attached to any BOAR record).

**QwikClick Morphology Counter On-line: (SEE SET-UP for information how to set this feature):** Manually assess all morphology defects and use the % Normal Morphology for AI dosing. This table is used exactly as the OFF-LINE morphology counter above. Differential Morphology results will be seen in the Morphology Report.

Off-line  
QwikClick  
Morphology  
Counter for  
full manual  
morphology  
assessment.

On-line  
QwikClick  
Morphology  
Counter for  
full manual  
morphology  
assessment.



## Real Time Video

### QwikClick/Video

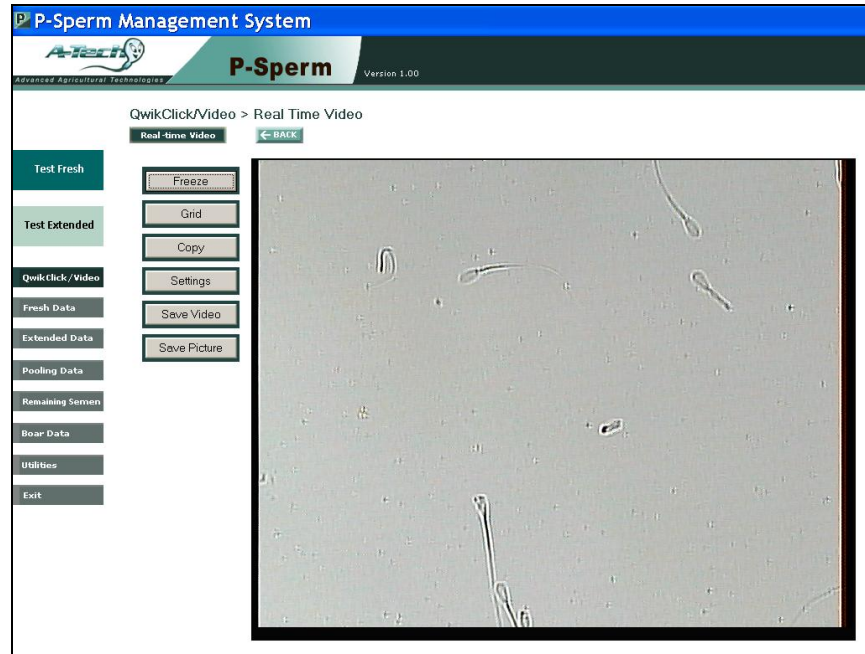
QwikClick

Real Time Video

Video Settings

← BACK

Click **REAL TIME VIDEO** and the following screen will be displayed:



- **FREEZE** – To freeze the screen. Click the REAL TIME button (displayed after image freezing) to un-freeze.
- **GRID** – A grid can be added to the screen to make counting easier.
- **COPY** – Pictures can be copied by clicking the COPY button and then pasting the picture in an external file (WORD, Excel, etc.).
- **SETTINGS** – Video settings can be selected by the user.
- **SAVE VIDEO/PICTURE** – Save video clips (.avi format) and pictures (.bmp format) in a PC file.
- **FULL SCREEN** – Double click on the image to maximize it. Use F1 to freeze/unfreeze and Esc to minimize an image.

## Video Settings

### QwikClick/Video

QwikClick

Real Time Video

Video Settings

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Click the **VIDEO SETTINGS** button to select grid line width, color and video settings. The appropriate video device settings are described in the video device installation procedure supplied with the video device hardware:

Grid line width	<input type="text" value="25"/>								
Grid line color	<input type="button" value="Color"/>								
Video compression	<input type="text" value="DivX MPEG-4 Video Codec"/> <input type="button" value="Properties"/>								
Video device	<input type="text" value="No Device"/>								
Video setting	<table border="1"> <tr> <td>video input</td> <td>video size</td> <td>video subtype</td> <td>analog video standard</td> </tr> <tr> <td><input type="text"/></td> <td><input type="text"/></td> <td><input type="text"/></td> <td><input type="text"/></td> </tr> </table>	video input	video size	video subtype	analog video standard	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
video input	video size	video subtype	analog video standard						
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>						



## AI Dosing

## Section 8: AI Dosing

When the FRESH sample testing is completed the Dosing Set-up screen below opens automatically:

**Dosing Set-up for test date 28/07/2011 15:38**

BOAR & SAMPLE DATA		
Boar Name	Star	Boar ID
Neat Ejac./Remaining Semen Vol. [ml]	100	Primary/Storage Extender Vol. [ml]
		Total Volume [ml]
<div> <div>100</div> <div>100</div> <div>200</div> </div>		
TEST RESULTS and CUT-OFFS		
Total Sperm [Bil]	173.2	Cutoff
Total Motile Sperm [Bil]	36.8	Pass/Fail
Total Morph. Norm. Sperm [Bil]	123.3	
FSI [Bil]	24.8	
Motility [%]	21.2	
Motility Grading [0-5]	2	
Morphology [%] - QCA DR	71.2	
<div> <div>3.0</div> <div>2.0</div> <div>2.0</div> <div>1.5</div> <div>70.0</div> <div>2</div> <div>70.0</div> </div>		
<div> <div>Pass</div> <div>Pass</div> <div>Pass</div> <div>Pass</div> <div>Fail</div> <div>Pass</div> <div>Pass</div> </div>		
Dosing Set-up		
Dosing Protocol	None	Add to Batch
Dosing Method	FSI	Enter: Pre-Extender Volume [ml]
Target # Sperm [Bil/Dose]	1.5	
Dose Volume [ml]	80	
Extender Name/Type	Long Term	
Pooling		
Dosing Results		
Doses Available [#]		
Doses Desired [#]		
Semen Volume [ml]		
Extender Volume [ml]		
Total Volume [ml]		
<div> <div>16</div> <div>16</div> <div>195</div> <div>1085</div> <div>1280</div> </div>		
Comments		
Sample		
Remaining Semen Volume [ml]		
Enter: Storage Extender		
<div> <div>Fail</div> <div>5</div> <div>0</div> </div>		
<div> <div>Save and Close</div> <div>Cancel</div> <div>Report</div> </div>		

### NOTE:

If manual morphology is to be considered for dosing, enter this into the morphology field by overwriting the displayed value. This will then be considered the morphology default for dosing.

The Dosing Set-up screen has four sections: **(1) Boar & Sample Data, (2) Test Results and Cut-offs; (3) Dosing and Pooling Set-up/Results and (4) Comments/Disposition of Sample.**

**Boar & Sample Data:** Basic information about the boar and the sample. All of the information in these fields is automatically imported, no data entry is required.

**Test Results and Cut-offs:** This section displays all the sample testing results, cut-offs (determined by the facility) and an indicator if the sample PASSED/FAILED based on the cut-offs. The sample is considered FAILED if one of the test results falls below the cut-off. The default cut-offs for "Total" parameters is based on the minimum targets for one AI dose.

- FSI – Functional Sperm Index in billions: This parameter is based on Concentration x Motility x Morphology x Correction Factor x (Neat Ejaculate or Remaining Semen Volume)
- The type of morphology assessment is indicated next to the Morphology (%) as follows:

A = Automated; QCA DR = QwikClick Droplet Assessment; QCA MC = QwikClick Morphology Counter; AMI = Average Morphology Index; O = Optional Manual Morphology Entry.

**Dosing and Pooling Set-up/Results:** Fresh samples can be dosed in a variety of ways using the SQA-Vp technology: **Single-sire, split** or **pooled**. AI dosing can also be performed offline from the **Fresh Data grid** (if the semen sample has not yet been dosed) and from the **Remaining Semen** grids by clicking the Dosing Set-up button.



## Single-sire AI Dosing

**NOTE:** The Dosing Set-up parameters can be pre-set by the administrator using protocols (See: Utilities > Set-up > System Settings > Administrator). If protocols are used, the operator only needs to select the DOSING PROTOCOL and the other DOSING SET-UP fields will be displayed automatically and locked.

### SINGLE-SIRE AI DOSING:

In order to perform Single-sire Dosing, the Dosing Set-up parameters should be defined. The software will store in memory the latest settings. Two options are to dose by **Dosing Protocol** or **Dosing Method**

- **Dosing Protocol:** Set-up protocols (see the Utilities section of this guide) prior to dosing:

Utilities > Set-up > System Settings > Administrator




- Once a protocol is set-up it can be selected from the drop-down menu in the **Dosing Protocol** field. The **Dosing Method**, **Target # Sperm (Bil/Dose)**, **Dose Volume (ml)** and **Extender Name/Type** fields will then be locked:

Dosing Set-up		Pooling	Dosing Results	
Dosing Protocol	None	Add to Batch	Doses Available [#]	15
Dosing Method	None	Enter: Pre-Extender Volume [ml]	Doses Desired [#]	15
Target # Sperm [Bil/Dose]	1-Total-1 2-Motile-1 3-Morph-1		Semen Volume [ml]	178
Dose Volume [ml]	80		Extender Volume [ml]	1022
Extender Name/Type	Long Term		Total Volume [ml]	1200

- **Dosing Method:** If 'None' is selected for Dosing Protocol, select from the Dosing Method drop down menu one of four dosing options: **Total Sperm**, **Motile Sperm**, **Morphologically Normal Sperm** or by **Functional Sperm Index (FSI)** and follow the instructions below:

Dosing Set-up		Pooling	Dosing Results	
Dosing Protocol	None	Add to Batch	Doses Available [#]	15
Dosing Method	Total Sperm	Enter: Pre-Extender Volume [ml]	Doses Desired [#]	15
Target # Sperm [Bil/Dose]	Total Sperm Motile Sperm Morph Normal FSI		Semen Volume [ml]	178
Dose Volume [ml]			Extender Volume [ml]	1022
Extender Name/Type	Long Term		Total Volume [ml]	1200

- **After selecting the Dosing Method**, enter the following information:
  - **Target # Sperm (Bil./Dose):** Enter the desired # of total, motile, morphologically normal or functional (FSI) sperm cells/dose.
  - **Dose Volume (ml):** Enter a number or select 80 or 100 ml in the menu box.
  - **Extender Name/Type:** Select from the drop down menu.

- Click  button and the dosing results will be displayed:

Dosing Set-up		Pooling	Dosing Results	
Dosing Protocol	None	Add to Batch	Doses Available [#]	12
Dosing Method	FSI	Enter: Pre-Extender Volume [ml]	Doses Desired [#]	12
Target # Sperm [Bil/Dose]	1.5		Semen Volume [ml]	171
Dose Volume [ml]	80		Extender Volume [ml]	789
Extender Name/Type	Long Term		Total Volume [ml]	960

Comments	Sample	Remaining Semen Volume [ml]
	Pass	9
		Enter: Storage Extender

Save and Close	Cancel	Report
----------------	--------	--------



- **Doses Available (#):** Total # of doses possible based on the selected dosing settings.
- **Doses Desired (#):** In single-sire dosing, the number of doses desired is equal to the number of doses available.
- **Semen Volume (ml):** The volume of semen to be used for dosing.
- **Extender Volume (ml):** The extender volume to be added to the sample.
- **Total Volume (ml):** The sum of the semen plus the extender volume.
- **Remaining Semen Volume:** The semen leftover (not used) in the dosing process. It can be seen in the Remaining Semen grid (Storage Extender should be added).
- **Sample Pass/Fail:** A PASS will be displayed if all results passed the cut-off criteria. If not, FAIL will be displayed.
- **Comments:** Type comments which can be viewed in the **Dosing Set-up Report** or by clicking on the "C" icon in the **Primary Sample Data** grid.
- Click the **REPORT** button to print the **DOSING SET-UP REPORT** (displayed automatically after saving dosing results if this is set by administrator):

**Dosing Set-up Report**

Zoom 50%

**Dosing Set-up Report**

Sample Data			
Boar Name	King	Owner	MES
Boar ID	2	Admin/Editor	1
Location	MES	Lab Tech	1
Breed	American Yorkshire	Collector	m
Test Date	05/05/2011 13:31		

Test Results		Cut-off	Sample Status
Total Sperm [B]	23.0	3.0	Pass
Total Motile Sperm [B]	22.7	2.0	Pass
Total Motile Norm. Sperm [B]	20.3	2.0	Pass
FSI [B]	19.1	1.5	Pass
Motility [%]	98.9	70.0	Pass
Motility Grading [B]	5	2	Pass
Motile [%] - OCA DR	88.4	70.0	Pass

Comments	Dosing Set-up	
There is no FSI protocol for single-sire dosing.	Dosing Protocol	
	Dosing Method	
	Target# Sperm [B/Dose]	
	Dose Volume [B]	
	Extender Name/Type	
	Batch ID	
	Dosing Instructions	
	Doses Available [B]	12
	Doses Desired [B]	12
	Semen Volume [B]	17.1
Extender Volume [B]	789	
Pre-extender Volume [B]	NA	
Total Volume [B]	960	
Remaining Semen		
Remaining Semen Volume [B]	9	
Storage Extender Volume [B]	10	

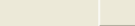
- Click button to print the report or the button to export report to a PC WORD file.
- Click **SAVE AND CLOSE** button in the Dosing Set-up screen to save the dosing results or **CANCEL** if the dosing results should not be saved.

#### Notes:

- **Save and Close** and **Report** buttons are disabled if **SAMPLE FAIL** is displayed or **Storage Extender** volume is not entered. Enter the amount of Storage Extender added to preserve the remaining semen. This is important for split and pooled dosing. A Storage Extender default can be set-up by the administrator (constant volume or a ratio of extender to semen volume).

17




- 

## SPLIT DOSING

- Overwrite **Doses Desired (#)** with the number of doses required for a particular split per customer request (This number cannot be more than Doses Available).



Dosing Set-up		Pooling		Dosing Results	
Dosing Protocol	None	Add to Batch	<input type="text" value=""/>	Doses Available [#]	12
Dosing Method	FSI	Enter: Pre-Extender Volume [ml]	<input type="text" value=""/>	Doses Desired [#]	8 
Target # Sperm [Bil/Dose]	1.5			Semen Volume [ml]	114
Dose Volume [ml]	80			Extender Volume [ml]	526
Extender Name/Type	Long Term			Total Volume [ml]	640

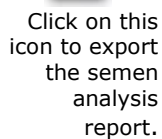
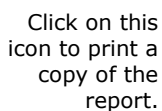
  

Comments	Sample	Remaining Semen Volume [ml]
<input type="text" value=""/>	Pass	<input type="text" value="66"/>
		Enter: Storage Extender
		<input type="text" value="30"/>

Save and Close	Cancel	Report
----------------	--------	--------

- Extend any leftover semen with a Storage Extender to preserve it for the next Split Dosing round. The record is saved in the Remaining Semen grid.
- A report will be displayed automatically if pre-set by the administrator. If not, click the **Report** button before saving to view and print the **Dosing Set-up Report**:



Posing Set-up Report

Zoom 50%

Dosing Set-up Report

Sample Data			
Boar Name	Klug	Names	
Boar ID	2	Owner	MES
Location	MES	Admin/Trainer	I
Breed	American Yorkshire	LBD Tech	I
Test Date	08/08/2011 14:51	Collector	m
Test Results		Cut-off	Sample Status
Total Sperm [B/I]	23.0	3.0	Pass
Total Motile Sperm [B/I]	22.7	2.0	Pass
Total Morph. Norm. Sperm [B/I]	20.3	2.0	Pass
FSI [B/I]	19.1	1.5	Pass
Motility [%]	98.9	70.0	Pass
Motility Grading [B-I]	5	2	Pass
Morph. [%] - QCA DR	88.4	70.0	Pass
Comments		Dosing Set-up	
		Dosing #/obool	Functional Sperm Index
		Dosing Method	1.5
		Target Eff Sperm [B/Dose]	80
		Dose Volume [mL]	Long Term
		Extender Name/Type	NA
		Batch ID	
		Dosing Instructions	
		Doses Available [mL]	12
		Doses Desired [mL]	8
		Semen Volume [mL]	114
		Extender Volume [mL]	535
		Pre-extender Volume [mL]	NA
		Total Volume [mL]	640
		Remaining Semen	
		Remaining Semen Volume [mL]	66
		Storage Extender Volume [mL]	30

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This document was created on 08/08/2011 14:51 from the following system user: IGB by Admin

Dosing Setup Report: 1 of 1



## Pooled AI Dosing

### POOLED DOSING

Several boar ejaculates and remaining semen may be pooled if this is part of the acceptable facility protocol. The SQA-Vp will track this process. Pooled Batches should be set-up in advance with dosing targets (see Pooling Data section). The pooled dosing procedure is as follows:

#### Note:

The Create New Batch function can be initiated from the Select Batch or Pooling Data screen.

- When the Dosing Set-up screen is opened, click the **Add to Batch** button.
- If **Pooled Batches** are not pre-set, the following message will be displayed:
- Click the **Create New Batch** button, and the screen below will pop-up.
- Enter the **Batch ID**, **Dosing Protocol** and **Doses Desired (#)**.

Select Batch

There are no batches listed.  
Please create a new batch

OK Clear Create New Batch

New Batch

Batch ID: 2 Doses Desired (#): 10

Dosing Protocol: 2-Motile-1 Dosing Method: Motile Sperm

Dose Volume [ml]: 100 Target # Sperm [Bil/Dose]: 2.0

Extender Name/Type: Short Term Miscellaneous: Special Batch

Clear All Save and Close Save and New Cancel

- Data will be displayed automatically based on the Dosing Protocol selected. No changes are permitted. If **Dosing Protocol: None** is selected, manually set all of the parameters.
- The Miscellaneous field is provided for notes or special facility input.
- If the Batch ID exists in the database, the following message is displayed:

P-Sperm

Warning:  
A batch with this # is already exists!

OK

- Press **Save and Close** to save the settings. The batch will appear in the **Select Batch** table:

Dosing Set-up for test date 07/08/2011 16:15

BOAR & SAMPLE DATA: Boar Name: King, Boar ID: 2, Breed: American Yorkshire

Next Ejac./Remaining Semen Vol. [ml]: 100, Primary/Storage Extender Vol. [ml]: 80, Total Volume [ml]: 180

TEST RESULTS and CUT-OFFS: Total Sperm [Bil], Total Motile Sperm [Bil], Total Morph. Norm. Sperm [Bil], FSI [Bil], Motility [%], Motility Grading [B-5], Morphology [%] - GCA DR

Dosing Protocol, Dosing Method, Target # Sperm [Bil/Dose], Dose Volume [ml], Extender Name/Type

Pass/Fail: Pass, Pass, Pass, Pass, Pass, Pass

Dosing Results: Doses Available (#): 11, Doses Desired (#): 11, Dose Volume [ml]: 175, Extender Volume [ml]: 924, Total Volume [ml]: 1188

Comments: Sample: Pass, Remaining Semen Volume [ml]: 4, Enter: Storage Extender

Save and Close Cancel Report

Select Batch table:

Batch ID	Doses Added (#)	Doses Still Required (#)
2	0	10



- The following data is displayed in the **Select Batch** table: Batch ID, Doses Added and Doses Still Required. This information can be compared in order to decide if a given semen sample/ejaculate is suitable for a particular pooled batch.
- Highlight the batch for pooling if several batches are set and press **OK**.
- Press **Clear** to disable selected batch from pooling.
- When a batch is selected for pooled dosing, the Dosing Set-up parameters related to this batch are displayed automatically and are protected from any change. In order not to mix different extenders, the Extender Name/Type should be the same as the Primary Extender used for extending the Fresh semen during collection.
- If the Dosing Set-up screen is opened off-line from the Remaining Semen grid, the system prevents selecting batches with extender types that vary from the extender used in the Remaining Semen.

Dosing Set-up for test date 07/08/2011 16:15

BOAR & SAMPLE DATA																										
Boar Name	King	Boar ID																								
Neat Ejac./Remaining Semen Vol. [ml]	100	Primary/Storage Extender Vol. [ml]																								
		Total Volume [ml]																								
<table border="1"> <thead> <tr> <th>TEST RESULTS and CUT-OFFS</th> <th>Cutoff</th> <th>Pass/Fail</th> </tr> </thead> <tbody> <tr> <td>Total Sperm [Bil]</td> <td>23.0</td> <td>3.0</td> </tr> <tr> <td>Total Motile Sperm [Bil]</td> <td>22.7</td> <td>2.0</td> </tr> <tr> <td>Total Morph. Norm. Sperm [Bil]</td> <td>20.3</td> <td>2.0</td> </tr> <tr> <td>FSI [Bil]</td> <td>19.1</td> <td>1.5</td> </tr> <tr> <td>Motility [%]</td> <td>98.9</td> <td>70.0</td> </tr> <tr> <td>Motility Grading [0-5]</td> <td>5</td> <td>2</td> </tr> <tr> <td>Morphology [%] - QCA DR</td> <td>88.4</td> <td>70.0</td> </tr> </tbody> </table>			TEST RESULTS and CUT-OFFS	Cutoff	Pass/Fail	Total Sperm [Bil]	23.0	3.0	Total Motile Sperm [Bil]	22.7	2.0	Total Morph. Norm. Sperm [Bil]	20.3	2.0	FSI [Bil]	19.1	1.5	Motility [%]	98.9	70.0	Motility Grading [0-5]	5	2	Morphology [%] - QCA DR	88.4	70.0
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	Pass	4																								
		Enter: Storage Extender																								
<div> <span>Save and Close</span> <span>Cancel</span> <span>Report</span> </div>																										

- In the **Dosing Results** section, Doses Desired (#) can be overwritten based on the Doses Still Required (#) reported in Select Batch table. Enter any number that does not exceed Doses Available (#), otherwise a Dosing Set-up Error message will appear.
- Pooling occurs in steps. Therefore, the initial semen is not fully extended unless Doses Still Required (#) are completely produced and the batch is closed.
- So Extender Volume is not reported at this point. Instead, enter the Pre-Extender Volume added to the semen to preserve it until the final extending process. Usually 1:1 or 1:2 dilution should work.
- When the Pre-Extender Volume is entered, the Total Volume is displayed automatically.
- Storage Extender for Remaining Semen should be entered by the user as well.
- Press **Save and Close** and the dosing results will be saved in the Fresh Data and Pooling Data grids:



**Dosing Set-up for test date 07/08/2011 16:15**

BOAR & SAMPLE DATA		
Boar Name	King	Boar ID
Neat Ejac./Remaining Semen Vol. [ml]	100	Primary/Storage Extender Vol. [ml]
		Total Volume [ml]

TEST RESULTS and CUT-OFFS		
Total Sperm [Bil]	23.0	Cutoff
Total Motile Sperm [Bil]	22.7	
Total Morph. Norm. Sperm [Bil]	20.3	
FSI [Bil]	19.1	
Motility [%]	98.9	
Motility Grading [0-5]	5	
Morphology [%] - QCA DR	88.4	
		Pass/Fail
		Pass
		Pass
		Pass
		Pass
		Pass

Dosing Set-up		Pooling	Dosing Results
Dosing Protocol	2 - Motile-1	Add to Batch	Doses Available [#]
Dosing Method	Motile Sperm	Enter: Pre-Extender Volume [ml]	Doses Desired [#]
Target # Sperm [Bil/Dose]	2.0		Semen Volume [ml]
Dose Volume [ml]	100		Extender Volume [ml]
Extender Name/Type	Short Term		Total Volume [ml]

Comments		Sample	Remaining Semen Volume [ml]
		Pass	100
		Enter: Storage Extender	50

Save and Close Cancel Report

- The report below is displayed automatically if this function is pre-set by the administrator. If not, click the **Report** button before saving to view and print the **Dosing Set-up Report**:

**P Dosing Set-up Report**

Zoom 50%

Dosing Set-up Report			
Sample Data			
Boar Name	King	Owner	MES
Boar ID	2	Administrator	I
Location	MES	Lab Tech	I
Breed	American Yorkshire	Collector	m
Test Date	08/08/2011 17:05		
Test Results		Cut-off	Sample Status
Total Sperm [Bil]	23.0	3.0	Pass
Total Motile Sperm [Bil]	22.7	2.0	Pass
Total Morph. Norm. Sperm [Bil]	20.3	2.0	Pass
FSI [Bil]	19.1	1.5	Pass
Motility [%]	98.9	70.0	Pass
Motility Grading [0-5]	5	2	Pass
Morph. [%] - QCA DR	88.4	70.0	Pass
Comments		Dosing Set-up	
		Dosing Protocol	2 - Motile-1
		Dosing Method	Motile Sperm
		Target # Sperm [Bil/Dose]	2.0
		Dose Volume [ml]	100
		Extender Name/Type	Short Term
		Batch ID	2
Dosing Instructions			
		Doses Available [#]	11
		Doses Desired [#]	5
		Semen Volume [ml]	80
		Extender Volume [ml]	NA
		Pre-extender Volume [ml]	80
		Total Volume [ml]	160
Remaining Semen			
		Remaining Semen Volume [ml]	100
		Storage Extender Volume [ml]	50

6-Dosages; QCA DR = QCA DR; Englebrecht; QCA DR = QCA DR; Morphology; Count; DR = Average Morphology; Pass; Q = Normal Morphology; Dry.  
This document was printed on 08/08/2011 17:05 from the P-Sperm system ver. 1.00 by A-Tech  
Dosing Set-up Report: 1 of 1

Pooled Dosing  
Set-up Report



Click on this  
icon to print a  
copy of the  
report.



Click on this  
icon to export  
the semen  
analysis  
report.



## Fresh Data Grid

## Section 9: Fresh Data Grid

Click **Fresh Data** in the P-Sperm Main Menu to open the grid below:

	Boar Name	Boar ID	Date	Time	Breed	Sample #	Time from Collect <30 min.	Neat Ejaculate Volume [ml]	Primary Extender Volume [ml]	Agglutination [%]	Sperm Conc. [M/ml]	MSC [M/ml]
U	King	2	07/08/2011	16:15	American	1	Yes	100	60	10	229.2	227.2
U	Shee	1	20/07/2011	15:38	American	1	Yes	100	100	10	1732.1	367.6
U	Star	1	28/07/2011	11:40	American	1	Yes	100	100	0	1945.2	833.7

Click in the grey box of the first column to select one record or drag the arrow to select multiple records. The second column indicates that the sample was dosed. Double click on the icon for details.



- Single-sire dosing



- Split dosing



- Pooled dosing



- Remaining Semen



- Wasted Semen

The following information is displayed in the **Fresh Data** table:

### Sample/Boar Information:

- **Boar Name** – Entered through the **Boar Settings** screen (Utilities > Set-up > Data Settings > Boar Settings).
- **Boar ID** – A unique boar identification number designated by the user in the Boar Settings table.
- **Date** – The date the sample was tested.
- **Time** – The time the sample was tested.
- **Breed** – The boar breed entered in the Boar Settings table.
- **Sample #** – The sample number designated by the user.
- **Time from Collection < 30 min.** – Indicates Yes or No.
- **Neat Ejaculate Volume** – The ejaculate volume (ml).
- **Primary Extender Volume** – The volume of extender added prior to or during collection of the ejaculate (ml).
- **Agglutination %** – Percentage of sperm cell agglutination noted visually.

### Test Results:

- **Semen parameters:** Sperm Concentration, MSC, Motility, Motility Grading, Morphology, Total Sperm, Total Motile Sperm, Total Morphologically Normal Sperm, FSI – Functional Sperm Index.
- **Sample Information:** Sample Pass/Fail.

### Additional Information:

- Lab Tech (name)
- A variety of the following icons indicating different features that are displayed in the other grids as well:



**Comments:** Click this icon to read the comments in the box below.

**Graphs:** This icon will appear when there are enough test results to graph. Click on the icon and select the parameter desired to produce a graph.

**Test results out of clinical range:** This icon marks test results are **out of the normal range** that has been determined by the user (please refer to the Utilities > Set-up > Data Settings > Normal Ranges section for details).

**Dosing mismatch:** This icon appears when the dosing requirements cannot be implemented. This can happen when the set-up values have been entered incorrectly or the semen sample is low quality.

**Picture indicator:** This icon appears when a picture is attached to a record. Click to view. Only one picture can be attached to each test.

**Video Indicator:** This icon indicates a video clip has been attached to the record. Click to view. Only one clip can be attached to each test.

**Two buttons** appear at the bottom of the **Fresh Data** screen:

- **Dosing Set-up:** Click to open the Dosing Set-up screen. It works ONLY when a sample was not dosed.
- **Delete:** Select a record and click to delete it. This button is enabled only if the sample was not dosed.

**Three buttons** are located in the upper right hand corner of the **Fresh Data** screen.

- Click: **SORT** and then click on the column header that contains the information to sort (Date, Boar ID, Sperm Conc., MSC, etc.).
- Click: **HIDE** and then select the columns to hide. The columns will disappear.
- Click: **VIEW ALL** to re-activate ALL of the hidden columns.

**Four buttons** and a date range setting are displayed at the top of the **Fresh Data** screen:


The date range is set to display data only in the selected range. The default is one month, however this can be re-set by the user. If the select a dates are too wide a range, the following message is shown:



Fresh Data

Primary Sample Data Video/Picture Report Export ← BACK

From Date 09/07/2011 To Date 09/08/2011 Select

Click **Primary Sample Data** or double click on the icon  of a selected record to display how the Primary Sample was used:

P-Sperm Management System

P-Sperm Version 1.00

Fresh Data > Primary Sample Data

Report Export ← BACK

Test Fresh

Test Extended

QuickClick/Video

Fresh Data

Extended Data

Pooling Data

Remaining Semen

Boar Data

Utilities

Exit

Primary sample test results:



Boar Name King Boar ID 2 Breed American Yorkshire Test Date 07/08/2011 16:15

Nest Ejaculate Volume [ml] 100 Sperm Conc. [M/ml] 229.7 Motility [%] 98.9 Motility Grading [0-5] 5

Primary Extender Volume [ml] 80 MSC [M/ml] 227.2 Morphology [%] - QCA DR 88.4

List of split records

Sort Hide View All

	Number of Doses (#)	Dosing Protocol	Dosing Method	Target # Sperm [Bil/Dose]	Dose Volume [ml]	Extender Name/Type	Date/Time	Total Sperm [Bil]	Total Motile Sperm [Bil]
	5	2 - Motile-1	Motile Sperm	2.0	100	Short Term	08/08/2011 17:06:27	10.2	10.1
	6	2 - Motile-1	Motile Sperm	2.0	100	Short Term	09/08/2011 18:15:07	12.2	12.0

Dosing Set-up Cancel Last Action Waste

**Primary Sample Test Results** are displayed in the upper part of the screen. A variety of icons shown in the grid indicate the type of dosing and remaining semen:



- Single-sire dosing



- Split dosing



- Pooled dosing



- Remaining Semen



- Wasted Semen

Dosing results, semen parameters with cut-offs and PASS/FAIL results are displayed.

Three buttons are located **at the bottom** of the screen:

Dosing Set-up Cancel Last Action Waste

- **Dosing Set-up** – opens a table for dosing Remaining Semen.
- **Cancel Last Action** – cancels the last dosing results.
- **Waste** – to delete any Remaining Semen from the Remaining Semen grid.

Two buttons are located **at the top** of the **Primary Sample Data** screen:

Fresh Data > Primary Sample Data

Report Export ← BACK

Click **Report** button and **Select Report** box will be opened:

Select Report

Report

Dosing Set-up Report (View)

Dosing Set-up Report (View)

Primary Samples

Report



Select **Dosing Set-up Report** to view the report shown below:

**Dosing Set-up Report**

Zoom 75%

Dosing Set-up Report			
Sample Data			
Boar Name	King	Names	
Boar ID	2	Owner	MES
Location	MES	Administrator	I
Breed	American Yorkshire	Lab Tech	I
Test Date	08/08/2011 17:06:27	Collector	m
Test Results		Cut-off	Sample Status
Total Sperm [Bil]	10.2	3.0	Pass
Total Motile Sperm [Bil]	10.1	2.0	Pass
Total Morph. Norm. Sperm [Bil]	9.0	2.0	Pass
FSI [Bil]	8.5	1.5	Pass
Motility [%]	98.9	70.0	Pass
Motility Grading [0-5]	5	2	Pass
Morph. [%] - QCA DR	88.4	70.0	Pass
Comments	Dosing Set-up		
	Dosing Protocol		2 - Motile-1
	Dosing Method		Motile Sperm
	Target # Sperm [Bil/Dose]		2.0
	Dose Volume [ml]		100
	Extender Name/Type		Short Term
	Batch ID		2
	Dosing Instructions		
	Semen Volume [ml]		80
	Extender Volume [ml]		NA
	Pre-extender Volume [ml]		80
Number of Doses [#]		5	
Total Volume [ml]		160	



Click on this icon to print a copy of the report.



Click on this icon to export the semen analysis report.

- Click the **Printer** icon to print the report.
- Click the **Export** button to save the data in Excel format (Excel software required).
- Use the **ZOOM** option to minimize/maximize the report view.
- **Exit** the report by clicking the "X" in the upper right hand corner of the screen.

Select **Primary Samples** to view the report shown below:

**REPORT: Primary Samples**

Zoom 100%

SQA-Vp REPORT: Primary Samples													
Boar Name		Boar ID		Breed		Test Date							
King		2		American Yorkshire		07/08/2011 16:15							
Neat Ejaculate Volume [ml]		Sperm Conc. [M/ml]		Motility [%]		Motility Grading [0-5]							
100		229.7		98.9		5							
Primary Extender Volume [ml]		MSC [M/ml]		Morphology [%] - QCA DR									
80		227.2		88.4									

Category	Number of Doses [#]	Dosing Set-up					Date/Time	Test Results						Semen Volume [ml]	Extender/Pre-Extender Volume [ml]	Remaining Semen Volume [ml]	Storage Extender Volume [ml]
		Dosing Protocol	Dosing Method	Target # Sperm [Bil/Dose]	Dose Volume [ml]	Extender Name/Type		Total Sperm [Bil]	Total Motile Sperm [Bil]	Total Morph. Norm. Sperm [Bil]	FSI [Bil]	Motility [%]	Morph. [%]				
Remaining Semen						Short Term		0.6	0.6	0.5	0.5	98.9	88.4			7	0
Peaked	5	2 - Motile-1	Motile Sperm	2.0	100.0	Short Term	08/08/2011 17:06:27	10.2	10.1	9.0	8.5	98.9	88.4	80	80	NA	NA
Split	6	2 - Motile-1	Motile Sperm	2.0	100.0	Short Term	09/08/2011 10:15:07	12.2	12.0	10.8	10.1	98.9	88.4	143	467	NA	NA

This Report represents the corresponding grid in a printable format.

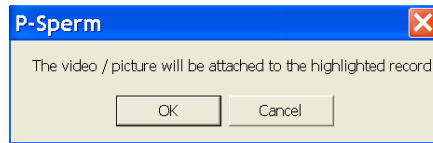
- Click: the **Export** button in the **Primary Sample Data** table to export data to Excel.

**Capture Image:** To save a video clip or picture and attach it to a record:

- Open: **Fresh Data**
- Insert a slide with a semen sample into the visualization system of the SQA-Vp.
- Highlight a record in P-Sperm to attach the video/picture.



- Click the **second button** of the **Fresh Data** screen – **Video/Picture**. The following message followed by the video screen will be opened:

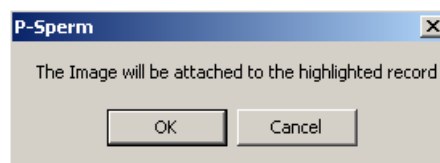


**NOTE:**  
The picture  
will be  
attached to  
the latest test,  
if no record is  
selected.

- Click: **Capture Picture** or **Capture Video** to save and attach a picture or video clip to the selected record. Click: **Stop Capturing** to end the video capture process.

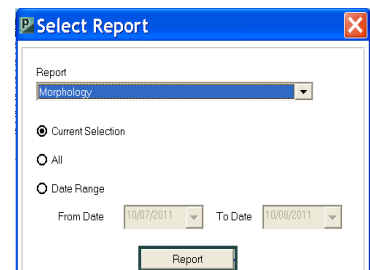
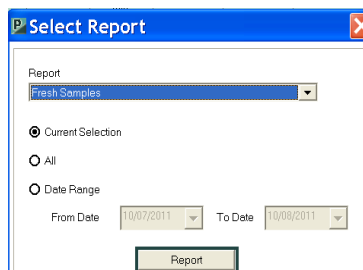
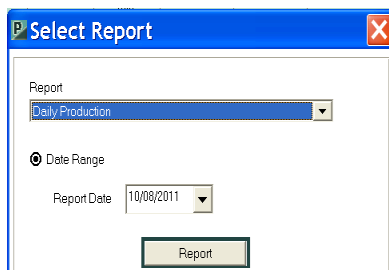


- The message below will be displayed to indicate that the image was saved and an icon will now indicate that a picture or video is attached to the record.



- To **delete** a picture or video simply click on the icon in the **Fresh Data** screen and click on the "Delete" (located in the lower corner of the viewing screen).

Click the **third button** of the **Fresh Data** screen – **Report**. The following box will display three report options. Select a date range or accept the current system default previously set up, or select ALL:





Select **Daily Production** to view and print the corresponding report combining Boar/Sample Data, Fresh Semen Parameters, Dosing Set-up and results and Extended Sample Test Results:

REPORT: Daily Production

Zoom100%

SQA-Vp

REPORT: Daily Production for 09/08/2011

Sample Data					Fresh Semen Parameters							Dosing Set-up				Dosing Results		Sample	Extended Sample Test Results					
Boar Name	Boar ID	Time	Category	Sample #	Total Sperm [Bil]	Total Motile Sperm [Bil]	Total Morph. Norm. Sperm [Bil]	FSI [Bil]	Motility [%]	Motility Grading [0-5]	Morph. [%]	Dosing Protocol	Dosing Method	Target # Sperm [Bil/Dose]	Dose Volume [ml]	Number of Doses [N]	Extender Name/Type		Sperm Conc. [M/ml]	Motility [%]	Motility Grading [0-5]	Totals per Semen Volume		
																						Total Sperm [Bil]	Total Motile Sperm [Bil]	Total Morph. Norm. Sperm [Bil]
Ace	3	10:01	Split	1	14.1	13.0	12.1	11	92.5	3	95.6 [QCA DR]	3 - Morph-1	Morph. Norm. Sperm	2.0	80	6	Long Term	Pass						
King	2	10:15	Split	1	12.2	12.0	10.8	10	98.9	5	98.4 [QCA DR]	2 - Motile-1	Motile Sperm	2.0	100	6	Short Term	Pass	15.3	91.2	1	1.5	1.4	
Ace	3	11:22	Split	1	12.9	11.8	10.1	9	91.5	2	79.0 [QCA DR]	3 - Morph-1	Morph. Norm. Sperm	2.0	80	5	Long Term	Pass						
Kim	4	11:59	Single Sire	1	20.8	24.0	24.7	22	91.7	2	92.3 [A]	Total Sperm		1.4	80	19	Long Term	Pass	10.9	91.0	2	1.7	1.5	
Kim	4	16:36		1	18.1	16.5	14.3	12	91.7	2	79.8 [QCA MC]			NA	NA	NA		Pass						

- Use the page bar at the bottom of the report to move between pages.
- Click the **Printer** icon to print the report.
- Click the Export button to save the data in Excel format (software required).
- Use the **ZOOM** option to minimize/maximize the report view.
- Exit the report by clicking the "X" in the upper right hand corner of the screen.



Click on this icon to print a copy of the report.



Click on this icon to export the semen analysis report.

Select **Fresh Samples** to view and print the following report displaying Sample Data and Test Results for the selected period of time:

REPORT: Fresh Samples

Zoom 100%

SQA-Vp  
REPORT: Fresh Samples  
Report Date: 09/08/2011 17:20

Sample Data								Test Results										Sample	
Boar Name	Boar ID	Date	Time	Breed	Sample #	Neat Ejac. Vol. [ml]	Primary Extend. Vol. [ml]	Sperm Conc. [M/ml]	MSC [M/ml]	Motility [%]	Motility Grading [0-5]	Morph. [%]	Totals per Ejaculate			FSI [Bil]			
													Total Sperm [Bil]	Total Motile Sperm [Bil]	Total Morph. Norm. Sperm [Bil]				
Ace	3	09/08/2011	09:58	American Yorkshire	1	110	100	228.1	210.9	92.5	3	95.6 [QCA DR]	25.1	23.2	21.5	19	Pass		
King	2	07/08/2011	16:15	American Yorkshire	1	100	80	229.7	227.2	98.9	5	98.4 [QCA DR]	23.0	22.7	20.3	19	Pass		
Star	1	28/07/2011	15:38	American Yorkshire	1	100	100	1732.1	367.6	21.2	2	71.2 [QCA DR]	173.2	36.8	123.3	25	Pass		
Star	1	28/07/2011	11:40	American Yorkshire	1	100	100	1946.2	833.7	42.9	3	71.5 [QCA DR]	194.5	83.4	139.3	57	Pass		
Kim	4	09/08/2011	11:59	American Yorkshire	1	100	100	267.8	245.6	91.7	2	92.3 [A]	26.8	24.6	24.7	22	Pass		
Ace	3	09/08/2011	11:20	American Yorkshire	1	90	120	144.3	132.0	91.5	2	79.0 [QCA DR]	13.0	11.9	10.1	9	Pass		
Kim	4	09/08/2011	16:36	American Yorkshire	1	85	90	213.2	195.4	91.7	2	78.8 [QCA MC]	18.1	16.6	14.3	12	Pass		

Select **Morphology** to view and print the Morphology report which displays Sample Data and QwikClick differential morphology results for the selected records:

REPORT: Morphology

Zoom 100%

SQA-Vp

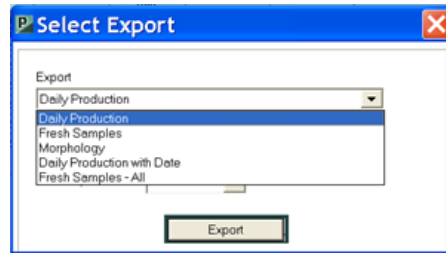
REPORT: Morphology

Report Date: 09/08/2011 17:27

Sample Data									QwikClick Morphology [%]								Morph. [%]	Morphology Method	
Boar Name	Boar ID	Date	Time	Breed	Sample #	Neat Ejac. Vol. [ml]	Primary Extend. Vol. [ml]	Agglut. [%]	Normal [%]	Heads [%]	Tails [%]	Midpiece [%]	Droplets (F) [%]	Droplets (D) [%]	Other 1 [%]	Other 2 [%]			
Kim	4	09/08/2011	16:36	American Yorkshire	1	85	90	5	78.8	6.1	3.0	9.1	3.0	0.0	0.0	0.0	0.0	78.8	QwikClick Counter



Click the **fourth button** of the **Fresh Data** screen: **Export** and the box below with five report options will be displayed. Use the current (date range) selection, select ALL records in the archive or input a new date range. Click the EXPORT button to send the data to EXCEL (software required)



Extended  
Data Grid

## Section 10: Extended Data

Click **Extended Data** and the screen below will be displayed. This screen will also automatically be displayed after EXTENDED tests are run in the SQA-Vp:

Offline Test	Boar Name	Boar ID	Batch ID	Date	Time	Breed	Sample #	Dose Prep. Date	Semen Volume [ml]	Agglutination [%]	Sperm Conc. [M/ml]
No	King	2	NA	09/08/2011	17:13	American	1	09/08/2011	100	15	15.3
No	Kim	4	NA	09/08/2011	17:10	American	1	09/08/2011	100	10	16.9

### Test Parameters reported for Extended samples:

- Sperm Concentration, M/ml
- MSC, M/ml
- Motility, %
- Motility Grading, (0-5)
- Total Sperm (billions)
- Total Motile Sperm (billions)

### Additional Features:

- Sample Pass/Fail
- Name of Lab Tech
- Graphs
- Indicator for "out of normal range"
- Pictures, video clips

The **Extended Data** screen has the same option buttons for displaying data as the previous Fresh Data table:



The same buttons are displayed at the top and bottom of the **Extended Data** table as were previously discussed in the **Fresh Data** table: **Video/Picture, Report & Export and Delete**. The function of these buttons is the same as previously described.



## Section 11: Pooling Data

Click **Pooling Data** and the screen below will be displayed.

**P-Sperm Management System**  
Version 1.00

**Pooling Data**  
View Details Report Export BACK

Select All Batches From Date 10/07/2011 To Date 10/08/2011 Select

Batch ID	Status	Doses Desired (#)	Doses Added (#)	Doses Still Required (#)	Average Motility [%]	Average Morphology [%]	Dosing Protocol	Dosing Method	Target # Sperm (Bil/D)
1	Closed	10	10	0	31.1	71.4	None	Morph. Norm. Sperm	1.5
2	Open	10	5	5	98.9	88.4	2-Motile-1	Motile Sperm	2.0
3	Open	12	0	12	0.0	0.0	4-FSI-1	FSI	1.5
4	Open	15	0	15	0.0	0.0	1-Total-1	Total Sperm	3.5

Add Doses to Batch Create New Batch Close Batch Re-Open Batch Delete Batch

The following information is displayed in the **Pooling Data** table:

### Sample/Boar Information:

- **Batch ID** – A unique batch identification # assigned by the user in the New Batch table.
- **Status** – Open/Closed
- **Doses** – Desired, Added and Still Required.
- **Semen Parameters** – Average Motility and Morphology.
- **Dosing** – Settings and volumes.
- **Date** – The date the batch was created.
- **Time** – The time the batch was created.

There are **five buttons** at the bottom of the **Pooling Data** screen:

Add Doses to Batch Create New Batch Close Batch Re-Open Batch Delete Batch

**Add Doses to Batch:** Click to add doses to an existing OPEN batch(es) of pooled semen.

**Create New Batch:** Click to set-up a new batch. The batch setting information is saved and shown in the Pooling Data grid and linked screens and reports.

**Close Batch:** Click to close the batch. When a batch is closed no further doses can be added unless it is re-opened.

**Re-open Batch:** Click to re-open a previously CLOSED batch to add more doses.

**Delete Batch:** Click to delete a batch if 0 doses were added. The message below will be displayed. Click **YES** and the batch will be deleted:

**P-Sperm**

Are you sure you want to delete the selected record?

Yes No



To add doses to an existing batch, click the **Add Doses to Batch** button after selecting the batch from the POOLING DATA grid. The following screen will open:

Pooling Data > Add Doses to Batch

**Add Doses to Batch** **← BACK**

Batch ID <b>3</b>	Date <b>10/08/2011 16:50</b>	Doses Desired [#] <b>12</b>	Doses Added [#] <b>0 [5]</b>	Doses Still Required [#] <b>12 [7]</b>
Dosing Protocol <b>4-FSI-1</b>	Dosing Method <b>FSI</b>	Target # Sperm [Bil/Dose] <b>1.5</b>	Dose Volume [ml] <b>80</b>	Total Volume [ml] <b>0</b>
Extender Name/Type <b>Long Term</b>	Avg. Motility [%] <b>0.0 [92.5]</b>	Avg. Morphology <b>0.0 [85.6]</b>		

**Close Batch**

\*You have selected to add more doses to the batch than required

Remaining Semen: **Sort** **Hide** **View All**

	Boar Name	Boar ID	Sample #	Number of Doses [#]	Extender Name/Type	Date/Time	Total Sperm [Bil]	Total Motile Sperm [Bil]	Total Morph. Norm. Sperm [Bil]	FSI [Bil]	Motility [%]	Mor
▶	Ace	3	1	5	Long Term	09/08/2011 10:01:42	11.0	10.2	9.4	8.3	92.5	
	Star	1	1	15	Long Term	28/07/2011 16:35:33	161.9	34.4	115.3	23.2	21.2	
	Star	1	1	35	Long Term	28/07/2011 11:47:00	183.8	78.8	131.6	53.7	42.9	

**Add to Batch**

**Batch** information is displayed in the first section of the screen. The **Remaining Semen** records that contain the SAME Extender Name/Type will be displayed. These can be used to add to the open batch. Select a record by clicking the in left hand column.

Click the **Add to Batch** button located in the lower left hand corner to open the **Add to Batch** box seen below:

P-Sperm Management System

**P-Sperm** Version 1.00

Pooling Data > Add Doses to Batch

**Add Doses to Batch** **← BACK**

**Test Fresh**  
**Test Extended**  
**QuickClick/Video**  
**Fresh Data**  
**Extended Data**  
**Pooling Data**  
**Remaining Semen**  
**Boar Data**  
**Utilities**  
**Exit**

Batch ID <b>3</b>	Date <b>10/08/2011 16:50</b>	Doses Desired [#] <b>12</b>	Doses Added [#] <b>10 [40*]</b>	Doses Still Required [#] <b>2 [0]</b>
Dosing Protocol <b>4-FSI-1</b>	Dosing Method <b>FSI</b>	Target # Sperm [Bil/Dose] <b>1.5</b>	Dose Volume [ml] <b>80</b>	Total Volume [ml] <b>800</b>
Extender Name/Type <b>Long Term</b>	Avg. Motility [%] <b>82.2 [60.5]</b>	Avg. Morphology <b>82.7 [76.6]</b>		

**Close Batch**

\*You have selected to add more doses to the batch than required

Remaining Semen: **Sort** **Hide** **View All**

	Boar Name	Boar ID	Sample #	Number of Doses [#]	Extender Name/Type	Date/Time	Total Sperm [Bil]	Total Motile Sperm [Bil]	Total Morph. Norm. Sperm [Bil]	FSI [Bil]	Motility [%]	Mor
▶	Star	1	1	30	Long Term	28/07/2011 16:35:33	161.9	34.4	115.3	23.2	21.2	
	Star	1	1	15	Long Term	28/07/2011 11:47:00	183.8	78.8	131.6	53.7	42.9	

**Add To Batch**

# Doses to Add to Batch: **2** **Calculate**

Semen Volume to Add [ml]: **201**

**OK** **Cancel**

Enter **# Doses to Add to Batch** based on the **Doses Still Required [#]** and press the **Calculate** button. The **Semen Volume to Add [ml]** will be re-calculated as well as the values in brackets for **Doses Added**, **Avg. Motility** and **Avg. Morphology** in the upper section of the screen. These re-calculations demonstrate the impact on the batch of adding the extra dose(s).

Press **OK** to confirm. If all of the **Desired Doses** were added to the batch, the screen below will be displayed: Select **YES** to close the batch or **NO** to keep it open.

**P-Sperm**

Close the Batch?

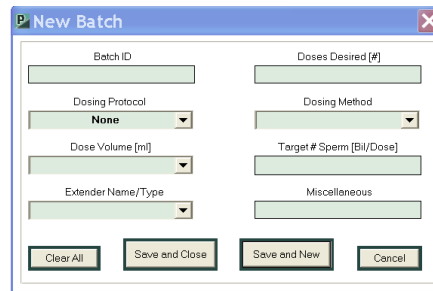
**Yes** **No**

The **three buttons below** are located in the upper right hand corner of the **Remaining Semen** grid of the **Add Doses to Batch** screen. Their function is the same as described previously:

**Sort** **Hide** **View All**



Click: **Create New Batch** to open the box below:

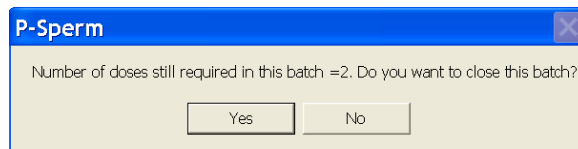


The 'New Batch' dialog box contains the following fields and buttons:

- Batch ID: Text input field
- Doses Desired [#]: Text input field
- Dosing Protocol: Drop-down menu (currently set to 'None')
- Dosing Method: Drop-down menu
- Dose Volume [ml]: Drop-down menu
- Target # Sperm [Bil/Dose]: Text input field
- Extender Name/Type: Drop-down menu
- Miscellaneous: Text input field
- Buttons: Clear All, Save and Close, Save and New, Cancel

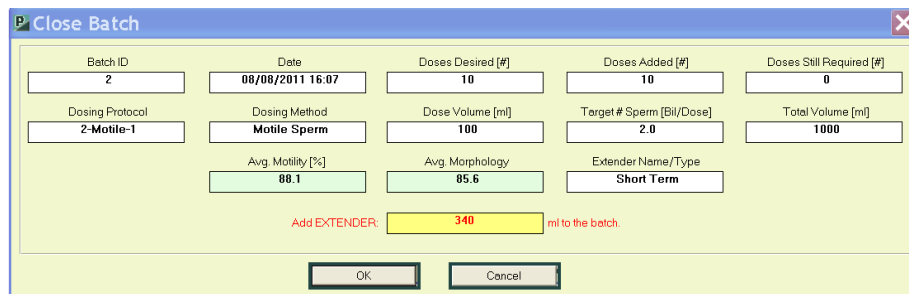
- **Batch ID:** Assign a new number that does not exist in a database.
- **Doses Desired (#):** Enter number of doses desired for this batch.
- **Dosing Protocol:** Select a pre-set protocol from the drop-down menu and Parameters will be displayed based on the Dosing Protocol selected. They cannot be changed in this case.
- If **Dosing Protocol: None** is selected, manually enter the other parameters.
- **Miscellaneous:** This field is not obligatory (provided for some notes).
- If the Batch ID entered already exists a warning message will be displayed.
- Press **Save and Close** to save the batch settings.
- Press **Save and New** to set-up additional batches.

Click the **Close Batch button** and the message below will provide information about the number of doses still required (it will show = 0 if the batch is completed).



The 'P-Sperm' dialog box displays the message: "Number of doses still required in this batch =2. Do you want to close this batch?" with 'Yes' and 'No' buttons.

Click **YES** and the **Close Batch** box below will appear:



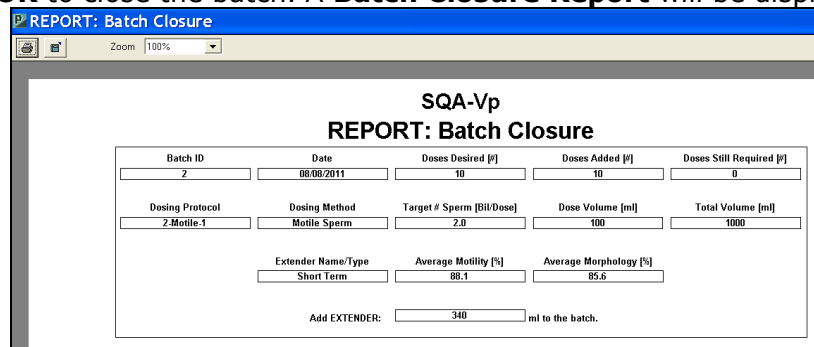
The 'Close Batch' dialog box displays the following information:

Batch ID 2	Date 08/08/2011 16:07	Doses Desired [#] 10	Doses Added [#] 10	Doses Still Required [#] 0
Dosing Protocol 2-Motile-1	Dosing Method Motile Sperm	Dose Volume [ml] 100	Target # Sperm [Bil/Dose] 2.0	Total Volume [ml] 1000
Avg. Motility [%] 88.1		Avg. Morphology 85.6		Extender Name/Type Short Term

Add EXTENDER: 340 ml to the batch.

Buttons: OK, Cancel

- Batch ID, Date, dosing information, Avg. Motility and Avg. Morphology will be displayed.
- The **Extender** volume to be added to completing the batch is displayed.
- Press **OK** to close the batch. A **Batch Closure Report** will be displayed:



The 'REPORT: Batch Closure' window displays the following information:

Batch ID 2	Date 08/08/2011	Doses Desired [#] 10	Doses Added [#] 10	Doses Still Required [#] 0
Dosing Protocol 2-Motile-1	Dosing Method Motile Sperm	Target # Sperm [Bil/Dose] 2.0	Dose Volume [ml] 100	Total Volume [ml] 1000
Extender Name/Type Short Term		Average Motility [%] 88.1	Average Morphology [%] 85.6	

Add EXTENDER: 340 ml to the batch.



**Three buttons** and date range table are located at the top of the **Pooling Data** screen:

Pooling Data

View Details Report Export ← BACK

Select All Batches From Date 10/07/2011 To Date 10/08/2011 Select

The default date range for displaying data is 1 month, however this can be re-set.

Select a record in the **Pooling Data** grid and click the **first button** – **View Details** or double click the record to view the details of the Pooled Batch.

P-Sperm Management System

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Pooling Data > View Details

Report Export ← BACK

Test Fresh

Test Extended

Quick Click / Video

Fresh Data

Extended Data

Pooling Data

Remaining Semen

Boar Data

Utilities

Exit

Batch ID	Date	Doses Desired [#]	Doses Added [#]	Doses Still Required [#]
2	08/08/2011 16:07	10	10	0
Dosing Protocol	Dosing Method	Target # Sperm [Bil/Dose]	Dose Volume [ml]	Total Volume [ml]
2-Motile-1	Motile Sperm	2.0	100	1000
Extender Name/Type	Avg. Motility [%]	Avg. Morphology		
Short Term	88.1	85.6		

Batch Details:

Sort Hide View All

Boar Name	Boar ID	Number of Doses [#]	Date/Time	Total Sperm [Bil]	Total Motile Sperm [Bil]	Total Morph. Norm. Sperm [Bil]	FSI [Bil]	Motility [%]	Morphology [%]	Semen Volume [ml]	Pre-ex Vol [ml]
King	2	5	08/08/2011 17:06:27	10.2	10.1	9.0	8.5	98.9	88.4	80	8
Ace	3	5	11/08/2011 11:11:36	13.6	10.0	11.2	7.8	73.3	81.8	58	44

In the upper section, **Batch** data is displayed. The lower section displays the semen aliquots used in the pool and their associated parameters.

Click the **Report** button to view and print the **Pooled Batch Data** report:

REPORT: Pooled Batch Data

Zoom 100%

SQA-Vp

REPORT: Pooled Batch Data

Batch ID	Date	Doses Desired [#]	Doses Added [#]	Doses Still Required [#]
2	08/08/2011 16:07	10	10	0
Dosing Protocol	Dosing Method	Target # Sperm [Bil/Dose]	Dose Volume [ml]	Total Volume [ml]
2-Motile-1	Motile Sperm	2.0	100	1000
Extender Name/Type	Avg. Motility [%]	Avg. Morphology		
Short Term	88.1	85.6		

Boar Name	Boar ID	Number of Doses [#]	Date/Time	Test Results						Semen Volume [ml]	Pre-extender Volume [ml]
				Total Sperm [Bil]	Total Motile Sperm [Bil]	Total Morph. Norm. Sperm [Bil]	FSI [Bil]	Motility [%]	Morph. [%]		
King	2	5	08/08/2011 17:06:27	10.2	10.1	9.0	8	99	88.4	80	80
Ace	3	5	11/08/2011 11:11:36	13.6	10.0	11.2	8	73	81.8	58	442



Click on this icon to print a copy of the report.



Click on this icon to export the semen analysis report.

Click **Export** button to save the data in an Excel file. The **Report** and **Export** buttons of the **Pooling Data** screen is based on the same principles as in the other screens.



## Remaining Semen Grid

## Section 12: Remaining Semen

Click **Remaining Semen** and the screen below will be displayed:

**P-Sperm Management System**  
Version 1.00

**Remaining Semen**  
Report Export < BACK

Test Fresh  
Test Extended  
Quick Click / Video  
Fresh Data  
Extended Data  
Pooling Data  
Remaining Semen  
Boar Data  
Utilities  
Exit

Number of Records 5

Boar Name	Boar ID	Sample #	Extender Name/Type	Date/Time	Total Sperm [Bil]	Total Motile Sperm [Bil]	Total Morph. Norm. Sperm [Bil]	FSI [Bil]	Motility [%]	Motility Grading [0-5]	Motility
Ace	3	1	Short Term	11/08/2011 11:11:37	24.4	17.9	20.0	13.9	73.3	2	
Star	1	1	Long Term	11/08/2011 10:43:43	146.9	63.0	105.2	42.9	42.9	0	
Ace	3	1	Long Term	10/08/2011 17:25:37	1.0	0.9	0.9	0.8	92.5	0	
Ace	3	1	Long Term	09/08/2011 11:22:41	0.1	0.1	0.0	0.0	91.5	2	
Star	1	1	Long Term	28/07/2011 16:35:33	161.9	34.4	115.3	23.2	21.2	2	

Dosing Setup Create New Batch Waste Waste All

Details of the boar, semen parameters and sample information including extender name/type are displayed in the **Remaining Semen** grid.

**Report, Export, Sort, Hide and View All** buttons function as previously described.

Four buttons at the bottom of the screen are described below:

- **CLICK: Dosing Set-up** to dose the Remaining Semen aliquots (all kinds of dosing, adding to the batches, etc.).
- **CLICK: Create New Batch** to perform the same functions previously described in other screens (**Pooling Data** screen and **Select Batch** box).
- **CLICK: Waste** to delete from the database any Remaining Semen aliquots.
- **CLICK: Waste All** to delete **ALL** the Remaining Semen aliquotes from the grid.

## Boar Data

## Section 13: Boar Data

Click **Boar Data** to view and print Boar reports for a specified timeframe. The table below will be displayed:

**P-Sperm Management System**  
Version 1.00

**Boar Data**  
Boar Settings Report Graph Export < BACK

Test Fresh  
Test Extended  
Quick Click / Video  
Fresh Data  
Extended Data  
Pooling Data  
Remaining Semen  
Boar Data  
Utilities  
Exit

Boar Name [ ] Boar ID [ ] From Date 11/07/2011 To Date 11/08/2011 Select

Boar Data									
Boar Name	Boar ID	Breed	Date Range	Avg. Nest Ejaculate Vol. [ml]					
NA	NA	NA	NA	NA					

Sample Type	Average Semen Parameters								
	Total Sperm [Bil]	Total Motile Sperm [Bil]	Total Morph. Norm. Sperm [Bil]	FSI [Bil]	Motility [%]	Motility Grading [0-5]	Morphology [%]	Sperm Conc. [M/ml]	MSC [M/ml]
Fresh	NA	NA	NA	NA	NA	NA	NA		
Extended	NA	NA			NA	NA		NA	NA

Number of Records 0

Date	Time	Sample # / Batch ID	Total Sperm [Bil]	Total Motile Sperm [Bil]	Motility [%]	Motility Grading [0-5]	Morphology [%]	Dosing Protocol	Dosing Method
------	------	---------------------	-------------------	--------------------------	--------------	------------------------	----------------	-----------------	---------------

Dosing Setup Create New Batch Waste Waste All

- Click on the drop-down menu **Boar Name** or **Boar ID** to select the boar.
- Set the timeframe (default is 1 month) and press **Select** to view the report below.





Click on this icon to print a copy of the report.



Click on this icon to export the semen analysis report.

**P-Sperm Management System**  
Advanced Agricultural Technologies **P-Sperm** Version 1.00

Boar Data  
Boar Settings Report Graph Export ← BACK

Test Fresh  
Test Extended  
QuickClick/Video  
Fresh Data  
Extended Data  
Pooling Data  
Remaining Semen  
Boar Data  
Utilities  
Exit

Boar Name: **Ace** Boar ID: **3** From Date: **11/07/2011** To Date: **11/08/2011** Select

Boar Data										
Boar Name	Boar ID	Breed	Date Range	Avg. Neat Ejaculate Vol. [ml]						
Ace	3	American Yorkshire	11/07/2011 - 11/08/2011	100						
Average Semen Parameters										
Sample Type	Total Sperm [Bil]	Total Motile Sperm [Bil]	Total Morph. Norm. Sperm [Bil]	FSI [Bil]	Motility [%]	Motility Grading [0-5]	Morphology [%]	Sperm Conc. [M/ml]	MSC [M/ml]	
Fresh	11.8	9.5	9.7	7.5	85.1	2	82.3			
Extended	NA	NA			NA	NA		NA	NA	

Number of Records: 8 Sort Hide View All

	Date	Time	Sample #/ Batch ID	Total Sperm [Bil]	Total Motile Sperm [Bil]	Total Morph. Norm. Sperm [Bil]	FSI [Bil]	Motility [%]	Motility Grading [0-5]	Morphology [%]	Dosing Protocol
▼	09/08/2011	10:01	1	14.1	13.0	12.1	10.6	92.5	3	85.6	3 - Morph-1
▼	09/08/2011	10:01	5	10.0	9.2	8.6	7.5	92.5	3	85.6	
▼	09/08/2011	11:22	1	12.9	11.8	10.1	8.8	91.5	2	78.0	3 - Morph-1
▼	09/08/2011	11:22	1	0.1	0.1	0.0	0.0	91.5	2	78.0	
▼	10/08/2011	17:25	1	1.0	0.9	0.8	0.8	92.5	0	85.6	
▼	11/08/2011	11:09	6	17.9	13.2	14.7	10.2	73.3	2	81.8	4 - FSI-1
▼	11/08/2011	11:09	4	13.6	10.0	11.2	7.8	73.3	2	81.8	4 - FSI-1
▼	11/08/2011	11:11	1	24.4	17.9	20.0	13.9	73.3	2	81.8	

The top section displays the average Neat Ejaculate Volume and Semen Parameters for the boar for the selected timeframe.

The lower part displays complete records of all the boar's semen and dosing history for the timeframe selected.

There are **four buttons** at the top of the **Boar Data** screen.

**Boar Settings** – Opens the Boar Settings table displayed below:

**P-Sperm Management System**  
Advanced Agricultural Technologies **P-Sperm** Version 1.00

Utilities > Set-up > Data Settings > Boar Settings  
Report Export ← BACK

Test Fresh  
Test Extended  
QuickClick/Video  
Fresh Data  
Extended Data  
Pooling Data  
Remaining Semen  
Boar Data  
Utilities  
Exit

Boar Name /	Boar ID	Breed	Owner	Location	QuickClick Assessment (Frequency):	Morphology: # Tests to Avg.
					every collection	1
Ace	3	American Yorkshire	MES	MES	every collection	1
Kim	4	American Yorkshire	MES	MES	every collection	1
King	2	American Yorkshire	MES	MES	every collection	1
Star	1	American Yorkshire	MES	MES	every collection	1

Save Global Morphology Settings Delete

- To add a new boar, click in the top cell and enter the boar information. Automatically updating drop-down menus are provided for some data entry.
- Click the **GLOBAL MORPHOLOGY SETTINGS** button to assign one QCA and AMI for the entire herd. Individual boar settings can be changed by clicking on a particular boar's cells in the table and entering new information.
- QwikClick Assessment Frequency (QCA):** Enter the frequency for QCA (assessing % droplets in the sample to increase the accuracy of morphology readings). Because morphology testing can be time consuming, in order to increase through-put while effectively monitoring the boar's morphology, select a collection cycle frequency for testing morphology (every, every 2nd, 3rd, 4th, 5th or 6th collection).



- **AMI: Average Morphology Index** is an average of several morphology results from the same boar. The number of morphology test results to include in the average is determined by the operator and can be from 1 to 6 results. The AMI for a given boar will be shown on the QwikClick Assessment or Morphology Counter. **To ensure quality, boars that have an AMI below the morphology cut-off will automatically be selected for morphology testing, regardless of the QCA cycle.**
- **Save or Delete** the settings by clicking the appropriate buttons.
- **Print or Export** (to EXCEL) the **Boar Settings** by clicking the buttons provided.

Click: **Report** in the **Boar Data** screen to open the **Individual Boar Report**:

REPORT: Individual Boar

Zoom: 100%

SQA-Vp

REPORT: Individual Boar

Boar Data									
Boar Name		Boar ID		Breed		Date Range		Neat Ejac. Vol. [ml]	
Kim		4		American Yorkshire		11/07/2011 - 11/08/2011		93	
Sample Type	Average Semen Parameters								
	Total Sperm [Bil]	Total Motile Sperm [Bil]	Total Morph. Norm. Sperm [Bil]	FSI [Bil]	Motility [%]	Motility Grading [0-5]	Morph. [%]	Sperm Conc. [M/ml]	MSC [M/ml]
Fresh	22.5	20.6	19.5	17.0	91.7	2	85.6		
Extended	1.7	1.5			91.6	2		16.9	15.5

Sample Data				Fresh Semen Parameters						Dosing Set-up				Dosing Results				Extended Sample Test Results			
Category	Date	Time	Sample # / Batch ID	Total Sperm [Bil]	Total Motile Sperm [Bil]	Total Morph. Norm. Sperm [Bil]	FSI [Bil]	Motility [%]	Morph. [%]	Dosing Protocol	Dosing Method	Target # Sperm [Bil/Dose]	Dose Volume [ml]	Number of Doses [F]	Extender Volume [ml]	Total Volume [ml]	Sperm Conc. [M/ml]	Motility [%]	Motility Grading [0-5]	Totals per Semen Volume	
																				Total Motile Sperm [Bil]	Total Sperm [Bil]
	09/08/2011	16:36	1	18.1	16.6	14.3	12.4	91.7	78.8			NA	NA	NA	NA	NA					
Single Site	09/08/2011	11:59	1	26.8	24.6	24.7	21.5	91.7	92.3		Total Sperm	1.4	80	19	1320	1520	16.9	91.6	2	1.7	1.5



Click on this icon to print a copy of the report.



Click on this icon to export the semen analysis report.

Press the **Graph** button of the **Boar Data** screen to view a graph of a selected boar semen **Parameter** over a specified timeframe.



Clicking opens the **Boar Data** report with averaged boar parameters and attaches the graph in a printable format.



## Utilities

# Section 14: Utilities

**Utilities** contain three sub-menus:



**Set-up** contains two buttons:

- **Data Settings**
- **System Settings**

## Data Settings

Click **Data Settings** and the following sub-menu will open:



**Boar Settings** – Please see Boar Data section.

**Normal Ranges** – Set-up normal ranges for semen test results:

P-Sperm Management System		
Utilities > Set-up > Data Settings > Normal Ranges		
Normal Ranges		
Test Fresh		
Parameter	Normal Ranges	Select
Neat Ejaculate Volume (ml)	50 - 100	↔
Sperm Conc. (M/ml)	150.0 - 2500.0	↔
MSC (M/ml)	100.0 - 2500.0	↔
Motility (%)	70.0 - 100.0	↔
Motility Grading (0-5)	3 - 5	↔
Test Extended		
Motility (%)	80.0 - 100.0	↔
Total Sperm (Bil)	20.0 - 120.0	↔
Total Motile Sperm (Bil)	14.0 - 120.0	↔
Total Morph. Norm. Sperm (Bil)	16.0 - 120.0	↔
PSI (Bil)		↔
Boar Data		
Extended Semen Ranges for AI Doses		
Parameter	Normal Ranges	Select
Sperm Conc. (M/ml)	20.0 - 40.0	↔
MSC (M/ml)	14.0 - 40.0	↔
Motility (%)	70.0 - 100.0	↔
Motility Grading (0-5)	3 - 5	↔
Total Sperm (Bil)	2.0 - 5.0	↔
Total Motile Sperm (Bil)	1.4 - 5.0	↔

- Click on the ARROW ↔ which points to the parameter to be set-up and the **Normal Range Settings** screen will appear:

Field	Symbol	Min	Max
Sperm Conc. (M/ml)	BETWEEN	150.0	2500.0

Apply Cancel

- Enter a symbol ( $\leq$ ,  $\geq$ ,  $=$ , BETWEEN, etc.) and the MIN/MAX values, press **Apply**.

## System Settings

Click **System Settings** to open the five options listed below:



## Administrator

Utilities > Set-up > System Settings > Administrator



This feature is password protected. The default password is **fertility**:

Utilities > Set-up > System Settings > Administrator > Change Password	
Change Password	← BACK
<div> <div>Password</div> <div></div> </div> <div> <div>New Password</div> <div></div> </div> <div> <div>Confirm new Password</div> <div></div> </div>	
Save	Cancel



Click **Settings** to display the table below. Click: ? for information about each setting:

Utilities > Set-up > System Settings > Administrator > Settings

Settings	← BACK
? Set FSI correction factor:	0.95
? Dose samples by protocol - no manual settings allowed:	No
? Restrict OPTIONAL morphology input to < = automated results:	No
? Automatically PASS/FAIL a sample per cut-off criteria:	No
? Lock cut-off default settings - no manual input allowed:	No
? Allow OPTIONAL morphology input	Yes
? Set a fixed volume [ml] OR a fixed ratio [extender to semen] of EXTENDER ADDED FOR STORAGE	No
? Activate Lab Tech/Collector sign-in fields:	Yes
? Automatically print the Dosing Set-up Report?	Yes
? Activate QwikClick	Yes
? Skip QwikClick (days of week)	
? QwikClick Setting	Morphology Counter

Save Cancel

Set FSI correction factor: The FSI (Functional Sperm Index) incorporates concentration, motility and morphology in the formula. FSI can be modified:

- Enter a number less than "1" (0.95/0.85/0.70) and the FSI will be reduced by that factor.
- A number greater than "1" will not be accepted.

Dose samples by protocol – no manual settings allowed: The Administrator can set-up pre-programmed dosing protocols that can be used instead of manually selecting each dosing criteria. After set-up, these protocols are selected from a drop-down menu on the dosing screen. The following options are available for this default setting:

- Select: YES to dose (single or multiple) only by the pre-set Administrator dosing protocols. All manual entry fields will be locked.
- Select: NO to have the option to dose by EITHER a pre-set protocol or by manual selection/entry. All manual entry fields will be un-locked.

Restrict OPTIONAL (manual) morphology to < = automated results: Manual morphology results can be run off-line and entered into a field on the dosing screen. The P-Sperm will then report manual morphology instead of automated. The manual morphology field can be restricted in the following way:

- Select: **YES** and OPTIONAL (manual) morphology results that are greater than the automated results cannot be entered into the manual morphology field. Manual morphology will be reported only if it is less than or equal to the automated results.
- Select: **NO** and the OPTIONAL morphology results and the manual results will be reported instead of the automated results.

Automatically PASS/FAIL a sample per cut-off criteria: After setting up cut-offs for various semen parameters, there is an option to automatically PASS or FAIL a sample based on these cut-offs. If a sample FAILS automatically, the dosing screen will not be visualized. The test results will still be reported. To use this feature:

- Select: **YES** and a sample will automatically PASS or FAIL based on pre-set cut-offs. If the sample FAILS, the QwikClick will be locked and only the EXIT button will be activated. Press EXIT and the test results grid will be displayed instead of the dosing screen.
- Select: **NO** to manually PASS/FAIL a sample and have the option to use the QwikClick Droplet Assessment and view the dosing screen.



Lock cut-off default settings – no manual input allowed:

Default settings for cut-offs can be set by the Administrator. Once these are set, they are reported in the QwikClick and Dosing Screens and PASS/FAIL results are displayed based on these cut-off values. Access to change these fields can be restricted:

- Select: **YES** to LOCK the Administrator defined cut-offs. The fields displayed in the QwikClick and Dosing screens cannot be changed.
- Select: **NO** and the Administrator defined cut-offs can be updated manually in the QwikClick and Dosing screens.

Allow OPTIONAL morphology input:

Morphology results can be run off-line and entered into the OPTIONAL field on the dosing screen. This optional field entry will then be reported on all P-Sperm morphology reports AND will be used to calculate doses (if morphology is part of the dosing protocol) instead of the automated or QwikClick morphology results.

- Select: **YES** to allow the entry of a morphology value in the OPTIONAL morphology field.
- Select: **NO** to block the OPTIONAL field from any input. Only AUTOMATED /QwikClick morphology will be reported.

Set a fixed volume (ml) or a fixed ratio (EXTENDER to SEMEN) of EXTENDED ADDED FOR STORAGE:

In order to preserve the sample for multiple dosing, an EXTENDER needs to be added in Round #1 of the Multiple Dosing cycle.

- Select **YES** to set a defined amount of EXTENDER for the first round (only) of MULTIPLE DOSING.
- Select **NO** to manually enter the EXTENDER volume.

If **YES** is selected, enter EITHER the RATIO of EXTENDER TO SEMEN or a FIXED EXTENDER VOLUME:

RATIO of EXTENDER to SEMEN: Enter a whole number that reflects the ratio of EXTENDER to remaining semen. (Example: Enter "1" to extend a 50cc sample with 50cc of extender; Enter "2" to extend a 50cc sample with 100cc of extender).

FIXED EXTENDER VOLUME: Enter a fixed volume of extender to be added to the sample in the first dosing round.

Activate Lab Tech/Collector sign-in screen:

- Select: **YES** to require a sign-in by the Lab Tech and Collector each time a sample is run and transferred to P-Sperm. The Lab Tech and Collector name will appear on reports.
- Select: **NO** and the sample results will be transferred without this information and will not be tracked in any report.

Automatically print the Dosing Set-up Report?

- Select: **YES** to automatically print the Dosing Set-up Report for both SINGLE and MULTIPLE dosing after the dosing information has been saved.
- Select: **NO** and the report can only be printed by selecting the PRINT button after dosing.

Activate QwikClick

- Select: **YES** to automatically activate the QwikClick morphology counter after running a test.
- Select: **NO** and the dosing screen will automatically be shown after running a test and the automated morphology will be reported.

Skip QwikClick (days of week)

Click the drop-down menu and check the days of week when QwikClick should be skipped.



## QwikClick Setting

### QwikClick Morphology Option 1: Droplet Counter (QCA)

Select to automatically activate the QwikClick Droplet Counter when testing a sample. This counter allows the operator to assess the % of droplets seen in the pig semen sample. This droplet factor (%) is then used to re-calculate the automated morphology value for VERY high accuracy that includes this non-motility based defect.

### QwikClick Morphology Option 2: Morphology Counter

Select to perform an on-line (links to a pig test report) completely manual morphology differential count. The value for % normal morphology will then be seen in the dosing screen and in all of the reports. The complete manual morphology differential can be seen on a separate morphology report.

**QwikClick** – to set-up the QwikClick Morphology Assessment table below:

Utilities > Set-up > System Settings > Administrator > QwikClick

QwikClick
← BACK

Classification	Assign Key	Color		Help
Normal	F1			
Heads	F2			
Tails	F3			
Midpiece	F4			
Droplets (F)	F5			
Droplets (D)	F6			
Other 1	F7			

Save
Cancel

### Classify morphology defects:

- Click on any cell in the classification column and type in a description of the morphology defect.
- All cells in the column must be labeled – enter OTHER 1 , 2, etc.
- The NORMAL cell is locked and cannot be changed.

### Assign function keys (F1 – F12):

- Click on each cell in the **ASSIGN KEY** column.
- Select a **FUNCTION KEY** (F1 – F12) from the drop down menu in each cell.
- The NORMAL key is locked – it is always F1.

### Select COLORS for the FUNCTION keys:

- Click on each cell in the **COLOR** column and select the color that will be assigned to the cell classification.

### Save settings.

**Dosing Protocols** can be pre-set. Enter the protocol definitions into the the first line of the table displayed below and click **Save**. The protocol will automatically be available in the DOSING SET-UP Screen(s) selected.

Utilities > Set-up > System Settings > Administrator > Dosing Protocols

Report Export ← BACK

Protocol #	Protocol Name	Dosing Method	Dose Volume [ml]	Target # Sperm [Bil/Dose]	Extender Name/Type	Apply to:
1	Total-1	Total Sperm	100	3.5	Short Term	Both
2	Motile-1	Motile Sperm	100	2.0	Short Term	Both
3	Morph-1	Morph. Norm. Sperm	80	2.0	Long Term	Single-sire & Split
4	FSI-1	FSI	80	1.5	Long Term	Pooling



**Report** and **Export** buttons function the same way as previously described.

**Cut-off Settings** can be pre-set by entering the cut-off values into the table provided:

Utilities > Set-up > System Settings > Administrator > Cut-off Settings

Cut-off Settings

← BACK

Cut-off Defaults

Parameter	Cut-off
Motility [%]	70.0
Motility Grade [0-5]	2
Morphology [%]	70.0
Sperm Conc. [M/ml]	50.0
Total Sperm [Bil]	3.0
Total Motile Sperm [Bil]	2.0
Total Morph. Norm. Sperm [Bil]	2.0
FSI [Bil]	1.5

Save Cancel

- **Motility Cut-off (%)**: Enter the lowest motility acceptable for dosing.
- **Motility Grade Cut-off (0-5)**: Enter the lowest acceptable Motility Grade.
- **Morphology Cut-off (%)**: Enter the lowest acceptable % normal morphology.
- **Conc. Cut-off (M/ml)**: Enter the lowest concentration acceptable for dosing (leave it empty if there is no cut-off).
- **Total parameters & FSI**: Enter the cut-offs that correspond to one AI dose targets (or based on your experience).

**Extender Set-up** can be performed from this screen:

Utilities > Set-up > System Settings > Administrator > Extender Set-up

Extender Set-up

← BACK

Extender OD	0.000
Transparent	Yes

Apply Cancel

- If **Transparent**, select **YES**, Extender OD will be 0.
- Click **Apply** and results will be saved.
- If **Transparent "No"**, click the **Continue** button at the bottom of the screen.

Utilities > Set-up > System Settings > Administrator > Extender Set-up

Extender Set-up

← BACK

Extender OD	0.000
Transparent	No

Continue >> Cancel



- The following sequence of screens will be displayed:

- Follow instructions and the following screens will be seen:

- Click **Finish** and results will be saved.

**Archive Management:** Click this button and the following screen will be shown:

Utilities > Set-up > System Settings > Administrator > Archive Manegment

To effectively handle the large database of boar information and permit faster data retrieval, enter **number of months** for archiving records and press **Save**.

**Click: Language** to customize the language used in P-Sperm Reports. Choose "Other" from the Language drop-down menu, fill-in the table as desired and click **Save**.

System	English
Add EXTENDER:	Add EXTENDER:
Administrator	Administrator
Agglutination [%]	Agglut [%]
Apply to:	Apply to:
Average Morphology [%]	Average Morphology [%]
Average Motility [%]	Average Motility [%]
Average Semen Parameters	Average Semen Parameters
Avg. Neat Ejaculate Vol. [ml]	Avg. Neat Ejaculate Vol. [ml]
Batch Data	Batch Data
Batch ID	Batch ID
Boar Data	Boar Data
Boar ID	Boar ID
Boar Name	Boar Name
Breed	Breed
Category	Category
Collector	Collector
Comments	Comments
Concentration	Concentration
Concentration Results [M/ml]	Conc. Results [M/ml]
Control Level	Control Level
Cut-off	Cut-off
Date	Date
Date Range	Date Range
Date Test Performed	Date Test Performed
Date/Time	Date/Time
Dose Prep. Date	Dose Prep. Date
Dose Volume [ml]	Dose Volume [ml]
Doses Added [#]	Doses Added [#]
Doses Available [#]	Doses Available [#]



Click **Password** to change to a new password. Enter and confirm the new password in the screen below. Click **Save** to immediately re-set and save the new password.

Utilities > Set-up > System Settings > Password

New Password

Confirm new Password

**Port:** Click this button to set the communication port for the PC:

Utilities > Set-up > System Settings > Port

Communication port

☒ COM1 ☐ COM2 ☐ COM3 ☐ COM4  
☐ COM5 ☐ COM6 ☐ COM7 ☐ COM8  
☐ COM9 ☐ COM10 ☐ COM11 ☐ COM12

**Auto Export:** This feature requires manufacturer support.

## Controls Testing

QwikCheck™ beads are produced by Medical Electronic Systems: [www.mes-global.com](http://www.mes-global.com))

**Please note:** QwikCheck beads verify that the concentration channel of the SQA-Vp is optimally functioning before a problem impacts the test results.

### NOTE:

Remember to set-up Controls before running a new box of QwikCheck Beads.

## Controls

Click **Utility>Controls** and three options are displayed: **Set-up**, **Test Results** and **Test Controls**:

Utilities > Controls

Click **Set-up** and to view the screen below:

Utilities > Controls > Set-up

Control Set-Up

Level 1			Level 2			Negative Control		
Lot #			Lot #			Lot #		
Exp. Date	08/11		Exp. Date	08/11		Exp. Date	08/11	
	Target Value	+/- Range		Target Value	+/- Range		Target Value	+/- Range
Automated	0	0.0	Automated	0	0.0	Automated	0.0	0.0

Enter the required information into the table. This information is on the QwikCheck™ beads box. Press **Report** to print out the settings. Press **Save** to apply the settings.

Click **Test Results** to view the control records for a selected timeframe (see below).

Click the **Test Controls** button and the screen below will be displayed:

Utilities > Controls > Test Controls

Level

Level 1

Lot Number

123

Expiration Date

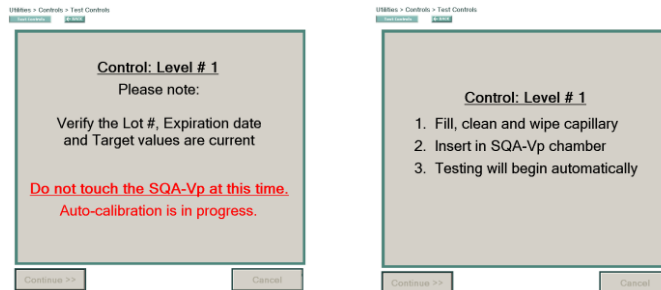
08/12

Target Value +/- Range

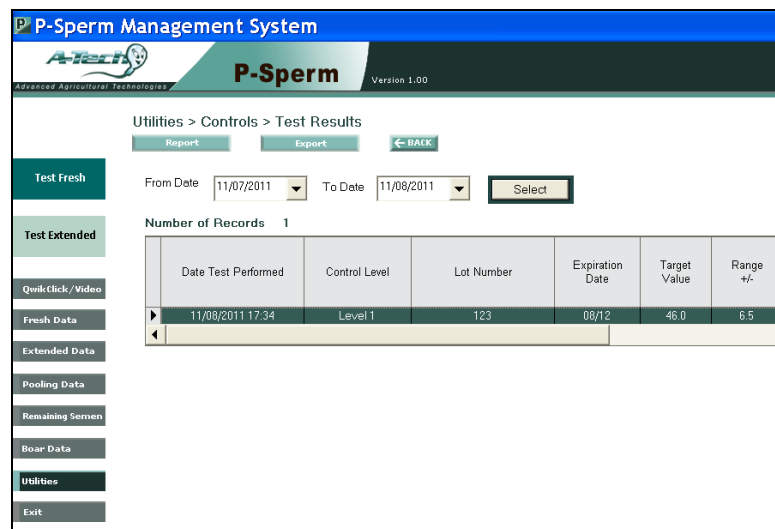
46.5 +/- 6.5



- Select the Control **Level**.
- **Lot Number**, **Expiration Date** and **Target Value +/- Range** can be set or over-written in this screen if require.
- Press **Continue** and follow the screen instructions:



- When testing is completed, the screen below will be displayed:



- Click the **Report** or **Export** buttons to print a report or export the control results to an Excel file.

**Utilities > SQA-Vp** – Click this button and two options are displayed:



Click **Self-Test Data** and this information will be displayed:

Utilities > SQA-Vp > Self-Test Data					
Self-Test Data      ← BACK					
Motility Channel			Conc. Channel		
REF. 1	170	mV	REF. 2	2800	mV
LED CUR. 1	8	mA	LED CUR. 2	19	mA
AMPLITUDE	67	mV	OD 1	0.0	M/ml
ZERO LEVEL	512		OD 2	1.2	M/ml
			OD 3	2.4	M/ml
Algorithm					
OD	0.0		CONC.	0.0	M/ml
AVERAGE	33.5		MOTILITY	0.0	%
COUNT	31.0		MSC	0.0	M/ml
AVERAGE WIDTH	15712.0		MOTILITY GRADE	1.0	
NUMBER SPIKE	63		MORPHOLOGY	NA	%



Print the **Service Data Report** which contains additional information:

Service Data Report

Zoom 75%

Service Data Report

<b>SQA-Vp SN</b>	633
<b>Print Date &amp; Time</b>	11/08/2011 18:02:08

Self-Test Data		
Ref. 1	170 [170]	mV
LED Cur. 1	8 [8]	mA
Amplitude	67	mV
Zero Level	512	
Ref. 2	2830 [2800]	mV
LED Cur. 2	19 [19]	mA
OD 1	0.000	
OD 2	1.215	
OD 3	2.367	

Service Data	
1 Control Ref. 1	11
2 Min. Sp. Height	5
3 Max. Sp. Width	150
4 SMI Thresh.	27
5 Average	33.52
6 Zero Level	512
7 OD	0.000
8 MSC Amplif.	50
9 Min. Sp. Width	10
10 Noise Thresh.	6
11 Control Z.L.	109
12 Count	31
13 OD Amplif.	97.0
14 Transm.	100
15 OD Value	1.700
16 OD Correction	110.0
17 Test Noise	1
18 LB OD Amp.	97
19 Amp. Correction	200
20 Amplitude Amp.	100
21 Extender OD	0.000

Algorithm		
OD	0.000	
Average	33.52	
Count	31	
Average Width	15712	
Number Spike	63	
Conc.	0.0	M/ml
Motility	0.0	%
MSC	0.0	M/ml
Motility Grading	1	
Morphology	NA	%

\*[ ] Real Time

Administrator Settings	
Set FSI correction factor:	0.95
Dose samples by protocol - no manual settings allowed:	No
Restrict OPTIONAL morphology input to < = automated results:	No
Automatically PASS/FAIL a sample per cut-off criteria:	No
Lock cut-off default settings - no manual input allowed:	No
Allow OPTIONAL morphology input:	Yes
Set a fixed volume [ml] OR a fixed ratio [extender to semen] of EXTENDER ADDED FOR STORAGE	No
Activate Lab Tech/Collector sign-in fields:	Yes
Automatically print the Dosing Set-up Report?	Yes
Activate QwikClick	Yes
Skip QwikClick (days of week)	
QwikClick Setting	Morphology Counter

**Verification** function is provided for Service Personnel only.

## Section 15: Exit

Click **Exit** to close the P-Sperm program. Confirm **YES** or **NO**.



## APPENDIX 1:

### System Requirements and Installation Instructions

**Warning:** The frame grabber should be installed prior to using P-Sperm!

#### System Requirements:

- SQA-Vp with RS232 communication cable and power cable

#### **PC requirements:**

##### Hardware requirements:

- 1Ghz or higher CPU; 256 MB RAM
- AGP Video Display Card with at least 16 MB of RAM memory
- CD-ROM compatible drive
- RS232 communication port (serial) and Two available USB ports

##### Software requirements:

- Windows XP and VISTA
- EXCEL (for exporting data)
- At least 40 GB of free hard disk space recommended
- Video resolution  $\geq 640 \times 480$  (recommended 1024x768)

#### **Video color quality $\geq 16$ -bit**

#### Installation: Video frame grabber USB device

*A FRAME GRABBER must be installed to use the video in P-Sperm. For installation instructions, please to the P-Sperm package insert.*

#### P-Sperm Installation

1. Close any open programs and insert the P-Sperm CD into the PC's CD-ROM. The installation process will begin automatically
2. Click **NEXT** when the screen displays "Initializing Wise Installation Wizard" and the "Welcome" screen appears.
3. Click **NEXT** when the "Choose Destination Location screen is displayed to accept the P-Sperm default folder or click "Browse" to select another folder.
4. Click **NEXT** when "Select Program Manager Group" is displayed. If a message "Digital Signature Not Found" is displayed, click YES.
5. Installation complete: Click OK to restart the PC.

#### Security Key Installation

Plug the P-Sperm security key into a free computer USB port to automatically install.



#### SQA-Vp Connection

- Connect one end of the RS232 communications cable to the PC, the other end to the SQA-Vp.
- Set-up system defaults by following instructions in the SQA-Vp User Guide.

#### Video Capture Device Settings

- Go to the P-Sperm: QwikClick/Video > Video Settings
- Using the drop-down menus, select the video capture device that has been installed (refer to the Video Capture Installation guide).



## APPENDIX 2:

### P-Sperm QwikClick Assessment (QCA) and Average Morphology Index (AMI)

#### **QCA Overview:**

**The QwikClick Assessment (QCA)** allows the operator to select how often the QwikClick Morphology will be automatically activated for boar morphology testing. Because morphology testing can be time consuming, in order to increase through-put while effectively monitoring the boar's morphology, the operator defines the frequency for testing morphology (every, every 2<sup>nd</sup>, 3<sup>rd</sup>, 4<sup>th</sup>, 5<sup>th</sup> or 6<sup>th</sup> collection).

#### **AMI Overview:**

**The Average Morphology Index (AMI)** is an average of several morphology results from the same boar. The number of morphology test results to include in the average is determined by the operator and can be as many as six. AMI is displayed in the QwikClick morphology counter of P-Sperm and can be viewed before a sample is divided into doses. To ensure quality, boars that have an AMI below the morphology cut-off will automatically be selected for QCA morphology testing, regardless of the QCA schedule.

#### **QCA and AMI Set-up in P-Sperm: From the BOAR SET-UP TABLE**

BOAR SET-UP TABLE						
Boar ID	Boar Name	Breed	Owner	Location	QwikClick Assessment (Frequency)	Morphology: # Tests to Avg.
					▼	▼
					every collection	2
					every 2 <sup>nd</sup>	3
					every 3 <sup>rd</sup>	4
					every 4 <sup>th</sup>	5
					every 5 <sup>th</sup>	6

Enter Global Morphology Setting Print Delete

#### **QCA (Frequency):**

- Select a boar (boars can be sorted by ID, NAME, BREED, etc.). Using the drop-down menu under [QCA \(Frequency\)](#), select which collections should include QCA (every, every 2<sup>nd</sup>, etc.). Press ENTER to save.
- The frequency of QCA can be set differently for each boar or can be set globally for the entire stud. To set globally, click the Global Morphology Setting and a screen will be activated. Enter the information about QCA (AMI can be set at the same time). Press ENTER to save. If QCA is set globally, individual boars can still be selected and the global setting can be overwritten.

#### **AMI – Morphology # Tests to Avg.:**

- Select a boar (boars can be sorted by ID, NAME, BREED, etc.). Using the drop-down menu under [Morphology # Tests to Avg.](#), select how many morphology tests to average for the AMI (up to 6). Press ENTER.
- AMI will immediately be displayed on the QwikClick morphology and dosing screens.
- The AMI can be set differently for each boar or can be set globally for the entire stud. To set globally, click the Global Morphology Setting and a screen will be activated. Enter the information about AMI (QCA can be set at the same time). Press ENTER to save.



## How to use QCA and AMI in the testing flow:

In the BOAR TABLE of the P-Sperm, each boar is scheduled for both QCA and AMI. When a boar is tested on the SQA-Vp for the first time, irrespective of the operator settings, the QCA screen in P-Sperm will be displayed. Since testing all boars the same day would slow down throughput, an optimal flow should be determined in the P-Sperm right from the beginning of SQA-Vp testing. Assume:

- 250 boars in the AI stud, collected two times/week and MONDAY and TUESDAY are the busiest test days
- The Frequency of QCA is set to "every 5<sup>th</sup>" (i.e. QwikClick morphology is run every 5<sup>th</sup> sample of a given boar)
- The AMI is set to "3" (average of 3 tests)

The table below describes how to FLOW the boars for testing QCA/AMI for greatest efficiency and throughput.

# Boars in a stud	Week	Collection	Days of week	# Boars tested	QCA	Notes
250	1	1 <sup>st</sup>	Mo	125	30	MANUAL SELECTION: Perform QCA only on boars whose AUTOMATED morph. < cutoff. Exit QCA screen without droplet counting if AUTOMATED morph. >= cutoff (press Exit button).
			Tu	125	30	
		2 <sup>nd</sup>	We	85	65	MANUAL SELECTION: Perform QCA on all boars not tested during 1 <sup>st</sup> collection. To determine this, look at the Test Results table when the QCA screen is opened. The Morphology will be labeled as "A"(automated), but not AMI (averaged) if the boar was already QCAed at least once. TEST the "A" boars.
			Th	85	65	
			Fr	80	60	
	2	3 <sup>rd</sup>	Mo	125	30	If all the boars have been QCAed during the first two collections, follow the P-Sperm AUTOMATED selection. PLEASE NOTE: If the Frequency of QCA is set to every 5 <sup>th</sup> collection, the QCA screen will not be opened for the 3 <sup>rd</sup> and 4 <sup>th</sup> collections unless the AMI (avg. morph. index) < cutoff.
			Tu	125	30	
		4 <sup>th</sup>	We	85	30	
			Th	85	30	
			Fr	80	30	
	3	5 <sup>th</sup>	Mo	125	30	Follow the P-Sperm automated selection based on the schedule plus samples to be re-tested if AMI < cutoff. The P-Sperm will alert the operator for BOTH types of these QCA tests.
			Tu	125	30	
		6 <sup>th</sup>	We	85	65	
			Th	85	65	
			Fr	80	60	

- **1<sup>st</sup> Collection:** At the beginning in the first two production days, QCA will include ~25% of the boars (**60+** of 250) ejaculates: All samples that have an automated morphology < cutoff (manual selection).
- **2<sup>nd</sup> Collection:** Then in the next three production days, QCA will include ~75% of the boars (**190+** of 250) ejaculates: Those boars not tested during the 1<sup>st</sup> collection (manual selection).
- Each day when 125 tests are performed, 30 QCA are done.
- Each day when 80-85 tests are performed, 60-65 QCA are done.
- In one week all the boars will have QCA at least one time.



- **3<sup>rd</sup> and 4<sup>th</sup> Collection:** Follow ONLY the automated QCA schedule: The QwikClick screen will be opened automatically for all QCA scheduled boars PLUS those boars whose AMI [average morphology index] falls below the morphology cutoff set by administrator.
- **5<sup>th</sup> and 6<sup>th</sup> Collections:** QCA will continue to run automatically (the software will select the QCA scheduled boars PLUS the boars whose AMI falls below the morphology cutoff set by administrator).



## APPENDIX 3: SQA-Vp SERVICE MENU

From SQA-Vp **MAIN MENU** select: **SERVICE MENU** to access one of 5 functions:

**SERVICE DATA:** Select this option to view three service screens:

- **Service Data screen (Communication screen):** Establishes communication between the SQA-Vp and the PC (P-Sperm) in order to:
  - Set-up the CONTROLS default settings
  - Report SQA-Vp service information for technical troubleshooting
- **Self-Test Data screen:** Provides system information after Self-Test (Self-Test Data) and after regular testing (Internal Data).
- **Algorithm data screen:** This screen displays algorithm calculations

**SERVICE PERSONNEL:**

- For technical services personnel only and requires a password to access.

**PRINT SELF-TEST DATA AND DEFAULT SETTINGS:**

Select to print the SQA-Vp **Self-Test Data** and **Default Settings**. To activate these functions:

- Highlight this option in the **SERVICE MENU** and press **ENTER**.
- Select: **Self-Test Data** or **Default Settings** and press **ENTER**.

**SETTINGS** Select this option to set the system and sample defaults.

**SYSTEM Default Settings:**

SYSTEM DEFAULT SETTINGS		
LOCAL TIME:	08:15:45	HH:MM:SS 24 h
DATE FORMAT:		MM/DD/YY D/MM/YY
DATE SETTING:		04/01/07

- **LOCAL TIME:** enter local time
- **DATE FORMAT:** Select the format **DD/MM/YY** or **MM/DD/YY** using the right/left arrows on the keyboard. Press **ENTER** to confirm.
- **DATE SETTING:** enter current date

**ADD TESTS TO COUNTER: I-button tests**

- Select **SERVICE > SERVICE MENU > ADD TESTS TO COUNTER** and press **ENTER**
- The SQA-Vp screen will instruct the user to: **HOLD NEW I-BUTTON AGAINST PORT AND PRESS ENTER**.
- Make sure the I-Button touches the internal surface and edges of the port. Press the I-button firmly in the port, moving it left and right to make sure it also touches the edges of the port.
- The **#TESTS ADDED** and the cumulative **#TESTS NOW REMAINING** will be displayed on the screen of the SQA-Vp.
- The screen will warn the user if an **EMPTY I-BUTTON** (was) **INSERTED**

**NOTE:** If the I-Button is not properly inserted a message: **I-BUTTON NOT PROPERLY ACTIVATED** will be displayed. Remove the button, press ESC and try again.



## APPENDIX 4: Troubleshooting SQA-V/P-Sperm Warning Screens

### Stabilization Failed:

**STABILIZATION FAILED**  
TURN OFF MAIN SWITCH ON REAR PANEL  
REACTIVATE UNIT  
  
IF PROBLEM PERSISTS,  
CALL FOR TECHNICAL SUPPORT

- Ensure there is no testing capillary in the measurement compartment.
- Remove the SQA-Vp from sources of electronic noise (centrifuge, cell phones, etc.).
- Clean measurement compartment (refer to Appendix).
- Reboot the SQA-Vp without a testing capillary in the chamber:
  - Turn system **OFF** then back **ON** at the main switch on the rear panel.
  - Press the front panel **ON/OFF** key to begin Auto-Calibration/Self-Test
  - Call for technical support if failure recurs.

### Failed Self-Test:

**FAILED SELF-TEST**  
TURN OFF MAIN SWITCH ON REAR PANEL  
CLEAN OPTICAL CHAMBER  
REACTIVATE UNIT  
  
IF PROBLEM PERSISTS,

- Ensure there is no testing capillary in the measurement compartment.
- Remove the SQA-Vp from sources of electronic noise (centrifuge, etc.).
- Clean measurement compartment (refer to Appendix).
- Reboot the SQA-Vp without a testing capillary in the chamber:
  - From the rear panel switch, turn the system **OFF** then back **ON**.
  - Press the front panel **ON/OFF** key to begin Auto-Calibration, Stabilization and Self-Test.
- Call for technical support if this message is displayed again. Prepare for technical support by printing a copy of the SQA-Vp Self-Test/Service Data:
  - Press **SERVICE** key. The **SERVICE MENU** will be displayed.
  - Select **PRINT SELF-TEST AND DEFAULT SETTINGS** option.
  - Select **SELF-TEST DATA** and press **ENTER** to print a copy of the self-test/service data.

### Electronic Noise:

**ELECTRONIC NOISE > 6**  
1. Clean the measurement chamber with a **BLUE DOT CAPILLARY** from the cleaning kit.  
2. Then dry the system with a **SPONGE DRYING CAPILLARY** from the cleaning kit.  
3. Click: **CONTINUE** to begin testing

Close

Continue



- The above message will be seen on the computer. Ensure there is no testing capillary in the SQA-Vp measurement compartment.
- Remove SQA-Vp from sources of electronic noise (centrifuge, etc.).
- Clean measurement compartment as instructed on the screen (or in Appendix section).
  - After cleaning, press: **CONTINUE** and re-run the test.
- If this message is displayed again, clean again.
- If this message is displayed a third time, reboot the SQA-Vp:
  - Turn the system **OFF** then back **ON** at the main switch on the rear panel.
  - Press the front panel **ON/OFF** key to begin Auto-Calibration and Stabilization.
  - From MAIN menu: Select **TEST NEW SAMPLE** and re-run.
  - Call technical support if this message is displayed again. Prepare for technical support by printing a copy of the Self-Test/Service parameters:
  - Press **SERVICE** key. The **SERVICE MENU** will be displayed.
  - Select **PRINT SELF-TEST AND DEFAULT SETTINGS** option.
  - Select **SELF-TEST DATA** and press **ENTER** and the service parameters will be printed.

#### Remove Capillary:

**REMOVE CAPILLARY  
FOLLOW ON-SCREEN INSTRUCTIONS**

- If the testing capillary has been left in the measurement chamber after testing a sample the message above will be displayed.
- Remove the testing capillary before running a new test.



## APPENDIX 5: Semen Sample Preparation

### EQUIPMENT REQUIRED:

- Extender
- Dispenser
- 10 ml Plastic Container
- Pipette
- SQA-Vp capillary
- Heater – set to 40°C (for 37°C sample heating)

### FRESH SEMEN SAMPLES:

- Place 2 ml aliquots of extender into the 10 ml sample containers provided in the test kit (figure 1)
- Pre-heat the extender to 37°C / 98.6°F for **4 minutes** in the SQA-Vp heater.
- Place SQA-Vp testing capillaries in the heater and pre-warm to 37°C / 98.6°F for at least **4 minutes**.
- Do not pre-heat the fresh sample!

### SAMPLE PREPARATION

1. Mix the entire semen sample thoroughly.
2. Extract exactly the volume of semen specified by the SQA-Vp onscreen instructions using a pipette (Figure 2).
3. Wipe the tip of the pipette to remove any excess semen.
4. Add the semen from the pipette to the pre-warmed extender in the 10 ml plastic container (Figure 3).
5. Close the plastic container and gently but thoroughly mix the sample for 10-20 seconds (Figure 4).
6. The sample is now ready for testing. Fill a pre-heated SQA-Vp testing capillary with the semen sample.

**NOTE:** DO NOT PRE-HEAT the **FRESH** semen sample (pre-heat only the extender and testing capillary) or motility and throughput will be impacted!

**NOTE:** Set the SQA-Vp heating device to 40C to obtain 37C heating of the testing capillary and extender.

**NOTE: PRE-HEAT** the **EXTENDED** semen sample for **ONLY 4 minutes** – do not heat for more or the sample may agglutinate and motility readings will be impacted!

### EXTENDED SEMEN SAMPLES:

1. Mix the extended semen in its original package.
2. Transfer 2 ml of sample into a 10 ml plastic container.
3. Pre-heat the sample to 37°C/98.6°F for **4 minutes**
4. Place SQA-Vp testing capillaries in the heater and pre-warm to 37°C / 98.6°F for at least **4 minutes**
5. Gently and thoroughly mix the sample for 20 to 30 seconds
6. The sample is now ready for testing.
7. Fill a pre-heated SQA-Vp testing capillary with the semen sample and test immediately.



Figure 1: Dispenser



Figure 2: Aspirate the required sample volume



Figure 3: Add semen to the extender

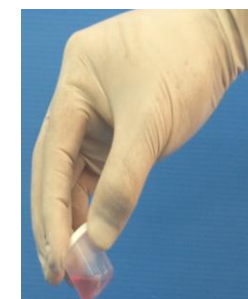
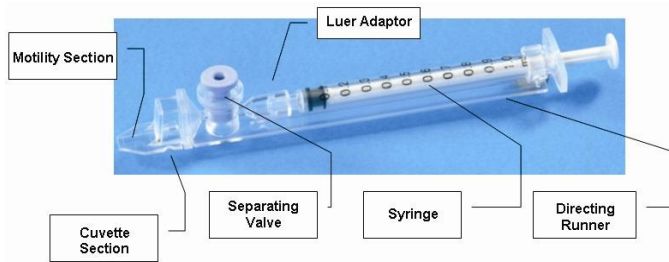


Figure 4: Thoroughly mix the sample.



## APPENDIX 6:

### Capillary Filling Instructions



1. Push the syringe piston in fully. Place only the thin part of the capillary into the bottom of the diluted sample (Figure 1).
2. Placing two fingers below the piston head pull the piston back slowly while keeping the tip of the capillary well below the sample level and surface bubbles (Figure 1).
3. Continue to aspirate the sample until it appears in syringe – hold in a vertical position and check to see that the sample has completely filled the thin section and the cuvette section and appears in the syringe (Figure 2).
4. Tap on the syringe to make sure there are no air bubbles in the sample.
5. Quickly and thoroughly wipe both the top and bottom of the outer surface of the capillary with a tissue. (Figure 3). Visually confirm that the capillary chambers are still full after wiping - a meniscus will be visible in the thin section of the capillary if sample has been lost due to wiping. If this is seen, push very slightly on the piston to re-fill the thin capillary section.
6. Slowly and carefully push-in the blue valve until it is level with the plastic. The capillary is now ready for testing (Figure 4).
7. Insert the capillary into the SQA-Vp (Figure 5)



**Figure 1**



**Figure 2**



**Figure 3**



**Figure 4**



**Figure 5**



## APPENDIX 7: SQA-Vp Cleaning Instructions

### When to clean:

Daily or after every 25 tests  
If the system fails **SELF TEST**

### Cleaning kit components:

Blue Dot capillaries (fig 1)  
Sponge-tipped drying capillaries (fig 2)  
Cleaning brush-wooden-handled (fig 4)  
Cleaning fluid

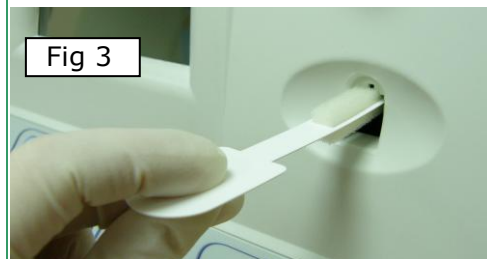
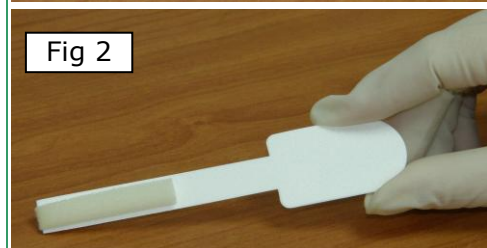
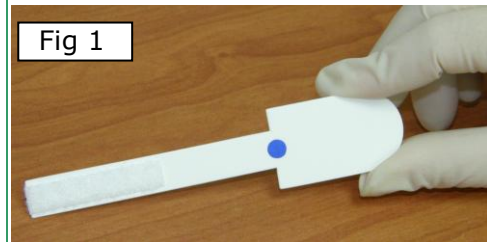
### CLEANING: STEP 1

1. **TURN OFF** the SQA-Vp.
2. Select a **BLUE DOT** fibrous material capillary.
  - Moisten with **ONE** drop of cleaning fluid, shaking off excess fluid.
  - Insert into the measurement compartment - fibrous material facing **DOWN**, and move back and forth a few times.
  - Insert a sponge-tipped drying capillary into the measurement compartment and move back and forth a couple of times to dry the chamber. (fig 3)

### CLEANING: STEP II

#### Use the wooden-handled cleaning brush:

1. Insert the brush (bristle-side down) fully into the upper portion of the measurement chamber. (fig 5)
2. Pull the brush out of the chamber while sweeping or "dusting off" the LED (you will feel a step or shelf at the back and top of the chamber – this is the top of the LED). (fig 6)
3. Switch SQA-Vp unit **ON** and observe self-test results. The SQA-Vp should now **PASS** the self-test. If not, repeat cleaning procedure with the brush.





## Testing Capillary



Reposition the blue valve with the jig



Remove the plunger



Reassemble the capillary

10 ml sample collection cups

## Appendix 8: Capillary Washing Instructions (For animal applications ONLY)

Both testing capillaries and 10ml sample collection cups can be washed and re-used up to 5 times by following this EASY procedure:

### Step 1 After running a test:

- Use the white capillary jig to re-position the blue capillary valve
- Expel semen by pumping the plunger a couple of times
- Soak the testing capillary in tap water until ready to wash

### Step 2 Set-up: Fill with 1 liter/2 quarts of solution as follows:

- Bowl #1: Tap water (marked "TAP WATER")
- Bowl #2: Distilled water (marked "DISTILLED WATER")
- Bowl #3: Isopropyl Alcohol 70% - 100%

### Step 3: Expel all liquid from the testing capillary:

- Pump the syringe plunger a couple of times to expel all remaining liquids.

### Step 4: Capillary Washing:

- **Bowl #1 Tap Water:** Completely fill each capillary with tap water. Expel the solution into a hazardous waste container. **Repeat 2 times** then go to Bowl 2.
- **Bowl #2 Distilled Water:** Completely fill each capillary with distilled water. Expel the solution into a hazardous waste container. **Repeat 2 times** then go to Bowl 3.
- **Bowl #3 Isopropyl Alcohol:** Completely fill each capillary with isopropyl alcohol and expel the solution into a hazardous waste container. **Repeat 2 times.**
- Remove the plunger from the syringe after isopropyl washing.

### Step 5: Drying the Capillaries:

- Place the capillaries on a flat surface and dry overnight or place in a low heat oven for a few hours until they are completely dry.

### Step 6: Final Preparation/Inspection:

- Replace the plunger into the syringe.
- Inspect the capillary for cracks (throw away) or semen (re-wash).
- Note the number of washings by making a dot on the capillary with a water proof marker after each washing cycle.

**Washing – Please refer to Step 4 Capillary Washing and follow the same process for washing in the solutions in bowls #1; #2 and #3. Turn upside down on absorbent paper to dry overnight.**



## Appendix 9:

# The Visualization System and Sperm Immobilization

The SQA-Vp Visualization System is for analyzing and viewing semen samples. Both the SQA-Vp testing capillary and a standard slide can be read in the visualization system. Pictures and videos of samples viewed in the visualization system can be captured and stored in P-Sperm. The system:

- Operates via control knobs to set focus, brightness, contrast and color, and via the keypad zoom, illumination, and monitor on/off functions.
- Has a magnification range: x300 to x500.

### Operating Instructions:

#### Slide Preparation For QwikClick Morphology Assessment (QCA)

The sperm cells must be immobilized but not overheated or droplets may burst. Follow the instructions below to ensure a quality reading:

- Place slides in the slide heater set to 55°C. Leave slides on the heater a minimum of 4 minutes.
- Place 10 µl of semen in the center but close to the edge of the slide.
- Do not leave on the heater more than 4 seconds.
- Use only a standard slide with a 22mm x 22mm cover-slip.
- Load the prepared slide into the SQA-Vp slide adaptor and insert into the visualization compartment of the SQA-Vp.

#### Testing Capillary Preparation:

- Insert a testing capillary filled with semen into the visualization compartment of the SQA-Vp.

#### Focusing the Visualization System:

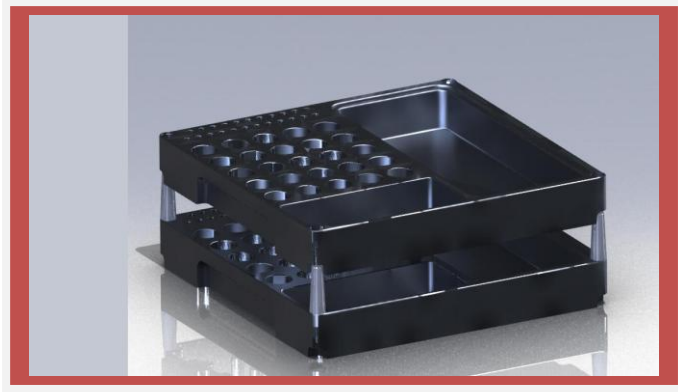
1. The video display illuminates when the SQA-Vp is turned on.
2. To ensure that the visualization system is working properly prior to use:
  - a. Press the **HIGH ILLUMINATION** key multiple times to achieve the maximum level setting.
  - b. Turn **BRIGHTNESS**, **CONTRAST** and **COLOR** buttons all the way counterclockwise.
  - c. Turn **FOCUS** knob fully clockwise.
3. Use **ZOOM IN** for maximum magnification (x500) or **ZOOM OUT** for minimum magnification (x300).
4. Insert the semen sample into the visualization chamber.
5. Turn the **BRIGHTNESS** knob clockwise until the video screen just begins to lighten-up.
6. Turn the **FOCUS** knob counter-clockwise until the image is in focus.
7. Adjust **CONTRAST**, **COLOR**, **BRIGHTNESS**, **FOCUS** and object **ILLUMINATION** controls for optimal image quality.

**NOTE:** Use caution when turning the focus knob. If resistance is felt it is at the maximum (or minimum) position. Forcing this knob beyond the stopping point may damage the focus system.



## Appendix 10: Heating Devices for Sample Testing

### For A-TECH Sperm Quality Analyzers with Heating Requirements



#### Safety:

- Do not pre-fill the SQA testing capillaries with semen prior to heating.
- Wipe any spilled material with a damp cloth after cooling the stages. Do not use chemical cleaning agents.
- Do not stack more than four plates at a time.

#### Instructions:

- Place 25, **empty** pipette tips in the small holes.
- Place 25 **empty** testing capillaries into the large well.
- Place 25, 10ml plastic cups with caps into the larger holes.
  - FRESH TESTING: Pre-fill each 10ml cup with **2 ml extender**. Close the cup with cap provided. Allow extender to reach 37°C (this takes about 10 minutes on a WARMED stage – this is why 2 stages are provided – one for testing, one for back-up to be rotated so that warmed supplies are always ready for testing)
  - EXTENDED TESTING: Pre-heat the cups – fill with EXTENDED semen just prior to testing. Do not leave the EXTENDED sample in the heater for more than 4 minutes or it will begin to agglutinate.
  - Cap the cups to prevent any evaporation prior to testing.
- Free well – place samples awaiting testing or optional supplies in the free well.

#### Heating:

- Place un-stacked individual heating stages **WITH SUPPLIES and EXTENDER** on a standard laboratory heating plate set to maintain 37°C for both samples and testing capillaries (this must be calibrated as the heating plate must be set HIGHER to maintain the appropriate sample temperature).
- Allow a one-time initial warm-up of up to 45 minutes for the stages. They will take longer to heat up initially than during the testing period. During the initial heating phase, do not place ANY semen in the wells.
- Once the stages are up to temperature, testing can begin.
- Rotate between the stages - #1 stage for testing; #2 stage for next round so that there is always an operating stage that is warm and back-up stage that is being warmed.



## Appendix 11: Glossary of Terms

	Terms	Definition
<b>Menu</b>	SN	Serial Number of the SQA-Vp
	DATE/TIME	The date and time the test was performed
	SAMPLE #	The number assigned to the semen sample
	BOAR ID	The identifying number of the boar being tested
<b>Test Results</b>	CONC.	Total sperm concentration expressed in millions/ml
	MSC	Motile sperm concentration expressed in millions/ml
	MOTILITY %	Percentage of motile spermatozoa: Motile Sperm Concentration divided by Total Sperm Concentration expressed as a %.
	GRADING MOTILITY	Motility Grade score (0-5) is related to progressiveness of motile sperm. Score 0 corresponds to absence of progressive motility whereas score 5 corresponds to the maximum progressive motility.
	MORPHOLOGY	Percentage of morphologically normal spermatozoa.
	SPERM #	The total number of sperm cells per ejaculate volume (Fresh samples) or per semen volume (Extended samples).
	MOT. SPERM	The total number of motile sperm cells per ejaculate volume (Fresh samples) or per semen volume (Extended samples).
<b>Dosing Calculations</b>	EXTENDER VOLUME	The amount (ml) of extender to add to the semen in order to produce the desired number of doses.
	TOTAL VOLUME	Semen volume (neat ejaculate + primary extender volume) + extender volume (ml)
	NUMBER OF DOSES	The total number of doses that will be produced based upon the users set-up parameters
<b>Dosing Set-up</b>	DOSING METHOD	Options to dose by: Total Sperm #; Motile Sperm #; or Morphologically Normal Sperm # in an A.I. dose
	DOSE VOLUME	The desired A.I. dose volume (ml): 80/100/other
	TARGET # SPERM	The number of spermatozoa according to the dosing method desired in an A.I. dose (Billion/Dose)
	MOTILITY CUTOFF	The lowest acceptable level of Motility
	MOTILITY GRADE CUTOFF	The lowest acceptable level of Motility Grade



## **Appendix 12: SQA-Vp System Specifications**

Dimensions: 40 x 30 x 15 cm

Weight: 4 kg

AC power supply: 100 to 250 VAC, 50/60 Hz, 10 VA

### **Measurement Compartment**

- **Sources of radiant energy** - two 880 nm LEDs for motility and spectrophotometry channels
- **Detector system** - 2 photo detectors - Motility and Optical Density

### **Visualization Compartment**

- Green LED illumination system
- CCD, 350 TV lines
- Objective lens: Standard, x20
- Signal Output: PAL standard
- Zoom system for smooth magnification transition from x300 to x500
- Focus regulator

### **Display(s)**

- Operational backlight LCD (16 lines x 40 characters)
- Video backlight LCD (8 x 10 cm)

### **Printer**

- Built-in, Dot Matrix
- Non-thermostatic narrow paper with 20 characters per line (Citizen)
- Ribbon cassette (Citizen)

### **Keypad**

- **Operational keys:** ON/OFF, TEST, PRINT, SERVICE, ARCHIVE, DELETE, ENTER, four cursor buttons, ESC, numeric buttons (0-9)
- **Video control keys:** ON/OFF, ZOOM IN/OUT, ILLUMINATION HIGH/LOW, and MONITOR ON/OFF

### **Front Panel**

- Built-in printer
- Visualization compartment
- LCD video display and controls
- Focus knob
- LCD operational display
- Measurement compartment
- Multi-button keypad



### Rear/Side Panel

- Power connector with fuse-holder (fuse 250V, 1A)
- Video connector
- RS232 cable outlet
- I-Button port (side panel)

### Specimen Testing Supplies

- **Measurement capillary:** Disposable, multi-use plastic, positive displacement testing capillary (purchase from manufacturer).
- **Standard lab slide:** 76 x 25.6 mm, 22 x 22 mm cover-slip.
- **I-Button:** Required to run tests (purchase from manufacturer)

### Archive Capacity

- 500 test records in each (Test Results and Control) archive

### Operating System

- **Control:** Keypad
- **Analysis Time:** 45 seconds for a Normal Test
- **Software:** Resides on flash memory and drives all man-machine interface functions, runs algorithms for test measurements and operational screens. System can be upgraded from a PC CD-ROM.
- **Sample Testing Temperature:** 37°C (98.6°F).
- **Motility channel input signal:** Analog, up to 5V.
- **Spectrophotometer channel input signal:** Modulated (1 kHz) analog, up to 5V.

### Quality Control

- **Internal:** Electronic Self-Test and Auto-Calibration.
- **External:** QwikCheck-beads control media.

### PC Compatibility

Minimum requirements for P-Sperm™ software

- **PC:** 1 GHz processor, Pentium 3
- **RAM:** 256 MB
- **AGP-video display card** with at least 16 MB of RAM memory
- **Video color:** At least 16 bit (65,535)
- **CD ROM drive**
- **40 GB free hard disk space** for image capturing and storage
- **Video resolution:** Minimum 640 x 480

**Operating system compatibility:** Windows 2000, Windows XP, DirectX, DivX

- **Ports:** One serial; two USB ports
- **Monitor:** 15" color

### Additional Software (supplied with system)

- **P-Sperm software:** Real time visualization interface between PC and SQA-Vp visualization system, data transfer, video/picture capture and archive.



### **Operational Temperature and Humidity**

- System is operational at 15-38°C.
- *NOTE:* SQA-Vp operates in a wide range of ambient temperatures however the system is calibrated to measure semen samples at 37°C (98.6°F).
- System is fully operational at up to 80% humidity and 31°C.

### **Maintenance Schedule**

- Cleaning daily and after every 50 tests (refer to User Guide – "Cleaning Instructions").

### **Manufacturer Recommendations**

- Operate the SQA-Vp away from devices that may cause electronic noise (cell phones) or other devices causing vibrations such as centrifuges.
- Turn system **OFF** at the rear-panel when not in use for extended period of time.
- Semen is considered a biologically hazardous material and is subject to individual laboratory protocols for handling such materials.

### **Factory Default Settings:**

**Date format:** DD/MM/YY

**Time/Date:** Manufacturer's local time/date

**Sample Type:** FRESH

**Automatically print:** YES

**Display test results:** YES

**Automatically send to PC:** YES

**Extender transparent:** YES



## Appendix 13: Product Performance Data

### Abbreviations:

CONC: Sperm Concentration  
CV: Coefficient of Variation  
M/ml: Million per milliliter

### Performance Data Summary:

The performance of the SQA-Vp system for boar semen analysis is summarized in the text, tables and graphs below. Sperm concentration measurements are expressed as  $10^6$  sperm cells per milliliter (M/ml). Motility is expressed as a percent (%). Unless otherwise noted all testing was performed using fresh and extended boar semen samples.

### Calibration:

Each SQA-Vp is biologically calibrated against two reference systems at Medical Electronic System's laboratory using boar semen.

### Dynamic Range:

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	-

### Precision and accuracy established against a known target (Latex beads)

**Background:** The precision and accuracy of the SQA-V were compared to a known target value using commercially available latex beads of two concentrations. Latex beads are used commercially to validate automated sperm counting systems. The beads were run on the SQA-V in the same manner semen samples are run on the system.

### Limitations of method:

Latex beads cannot:

- Measure sperm motility or morphology
- Correct for inaccurate chamber depths or technician errors

### Methodology:

A total of 320 latex bead samples were tested on ten SQA-V systems. The precision of the SQA-V is demonstrated in Table 1. SQA-V concentration readings were compared to the established target values +/- the acceptable range for the latex beads (Fig. 1 & 2).

### Accu-beads® published ranges (Hemocytometer):

- Vial #1: 47 +/- 7.0 M/ml
- Vial #2: 24 +/- 3.4 M/ml

Table 1: Precision

SQA-V	Latex-beads	CV %
Intra-device Variability	High 47± 7.0 M/ml	≤ 0.01
	Low 24 ± 3.4 M/ml	≤ 0.01
Inter-device Variability	High 47± 7.0 M/ml	≤ 2.00
	Low 24 ± 3.4 M/ml	≤ 2.50

Fig. 1. Accuracy: High Level Control

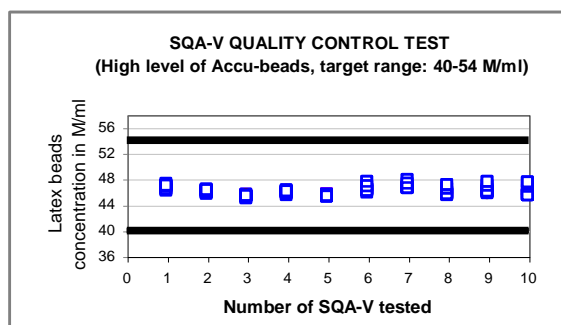
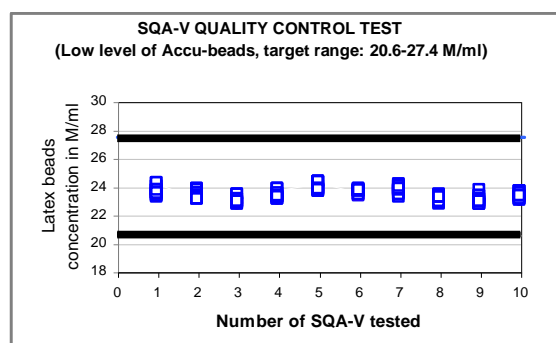


Fig. 2. Accuracy: Low Level Control





### Conclusions:

The **CONTROL** mode software of the SQA-Vp (pig) device is exactly the same as the SQA-V (human) system. Both systems also have the same hardware platform. Therefore, the accuracy and precision results obtained on the CONTROL mode of the SQA-V will be the same as that of the CONTROL mode of the SQA-Vp.

### Sensitivity, specificity, precision and correlation to manual methods established in MES laboratories and field clinical trials using boar semen samples

#### Clinical claims:

#### Sensitivity

- Concentration: 90%
- Motility: 75%
- Grading Motility: 60%
- Morphology: 60%

#### Specificity

- Concentration: 90%
- Motility: 75%
- Grading Motility: 80%
- Morphology: 80%

#### Precision (CVs)

- Conc.: 3%
- Motility: 5%
- Morphology: 5%

#### Correlation to Manual Method:

- Concentration: 0.9
- Motility: 0.8
- Morphology: 0.7

#### Notes:

- Sensitivity and specificity **claims** are lower than actual values noted (Table 2).
- Precision CV **claims** are higher (lower precision) than actual values noted (Table 3).
- Correlation to Manual Method **claims** are less than actual correlations noted (Table 4).

#### Method comparison:

SQA-Vp was compared to the microscope based on WHO'99 manual guidelines. The SQA-Vp automated readings of the sperm concentration, motility and morphology were compared to microscopic results. A Makler chamber was used according to manufacturer's instructions for manual sperm concentration measurements. A standard slide and P-Sperm software were used to assess manual motility. The stained slides were used for the manual morphology examination. The protocols were based on WHO'99 manual and MES guidelines. The alpha-site clinical trials were conducted at the Lahav farm. A total of 58 fresh and extended semen samples were analyzed.

**Table 2: Sensitivity/Specificity**

SQA-Vp vs. Microscope	Sensitivity, %	Specificity, %
Sperm Concentration	<b>91.7</b>	<b>95.2</b>
Motility	<b>80.0</b>	<b>79.0</b>
Grading Motility	<b>66.7</b>	<b>89.1</b>
Morphology	<b>66.7</b>	<b>84.0</b>

**Table 3: Precision: SQA-Vp intra-device variability (CV, %)**

Semen Variable	CV, %
Sperm Concentration M/ml	<b>2.1</b>
Motility, %	<b>4.0</b>
Morphology, %	<b>3.6</b>

**Table 4: Correlation to manual method**

Parameters	Correlation coefficients
Sperm Concentration, M/ml	<b>0.99</b>
Motility, %	<b>0.83</b>
Morphology, %	<b>0.71</b>



### Analytical Specificity:

- To achieve analytical specificity a specific wave length of light which is maximally absorbed by sperm cells and minimally absorbed by other cells and seminal plasma is used.
- Low noise and high electronic resolution hardware components and compensation circuits ensure that analytical specificity is optimized.

### Limitations of method:

Samples were assessed in duplicate on the automated SQA-Vp system and manually using a microscope. Statistical counting errors and intra-operator variability (subjectivity) may have affected the results of the study.

### Performance parameters:

- Sensitivity and specificity were calculated using ROC analysis formulas. The cutoffs normally used for the sperm concentration, motility and morphology were used for calculation of sensitivity and specificity (Table 2).
- Precision of the SQA-Vp device was estimated by calculation of the intra-device coefficients of variation (CV) of the duplicate measurements (Table 3). CV is calculated according to the formula:

$$CV = SD / MEAN \times 100$$

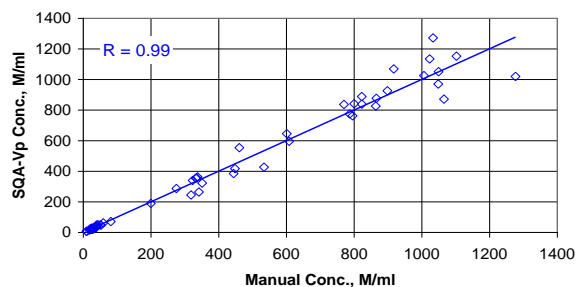
The lower CV, the higher precision of the method.

- Correlation to manual method was established by calculation of correlation coefficients (Table 4, Fig. 3-5).

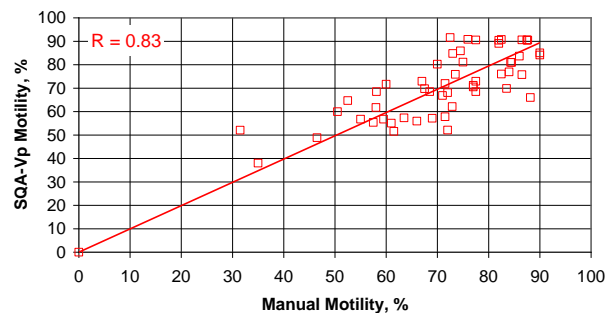
### Conclusions:

- The sensitivity, specificity and correlation of the SQA-Vp to the manual method are very high. Therefore the instrument can replace the manual method for assessing, dosing and extending pig semen.
- The SQA-Vp is precise and reports accurate results with low coefficients of variation for the semen variables assessed (<6%).

**Fig. 3: Method comparison: Regression plot of SQA-Vp Sperm Concentration in boar semen vs. manual results**



**Fig. 4: Method comparison: Regression plot of SQA-Vp Motility in boar semen vs. manual results**



**Fig. 5: Method comparison: Regression plot of SQA-Vp Morphology in fresh boar semen vs. manual results**

