

Care and Maintenance of Portable Meters

**2011 Meter Technician Training School
Springfield, MO**



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Topics to Cover...

- **Maintenance of Approved Meters**
- **Storage and Transport of Meters**
- **Cleaning and Sanitizing Meters**
- **Proper Sampling and Reading**

Maintenance of Approved Meters

Tru-Test Pull-Out



- ▶ Most popular meter in Northeast and Midwest
- ▶ Easy to maintain
- ▶ Standard Bore (old) or Wide Bore (new) models
- ▶ Inefficient labor-wise
- ▶ Low cost of ownership

Tru-Test Pull-Out - Maintenance



- ▶ Replace VSO at least once per year
- ▶ Replace gasket on cap yearly
- ▶ Do not over-tighten the flask foot
 - Places stress on meter body
 - \$160 repair cost
- ▶ New laser-etched flasks – do not use flask tapes on flasks for WB meters



Tru-Test Ezi-Test



- ▶ Most popular meter in the world
- ▶ Milk, Wash/Mix and Sample positions
- ▶ Standard Bore (old) or Wide Bore (new) models
- ▶ Self-contained (closed system)

Tru-Test Ezi-Test - Maintenance

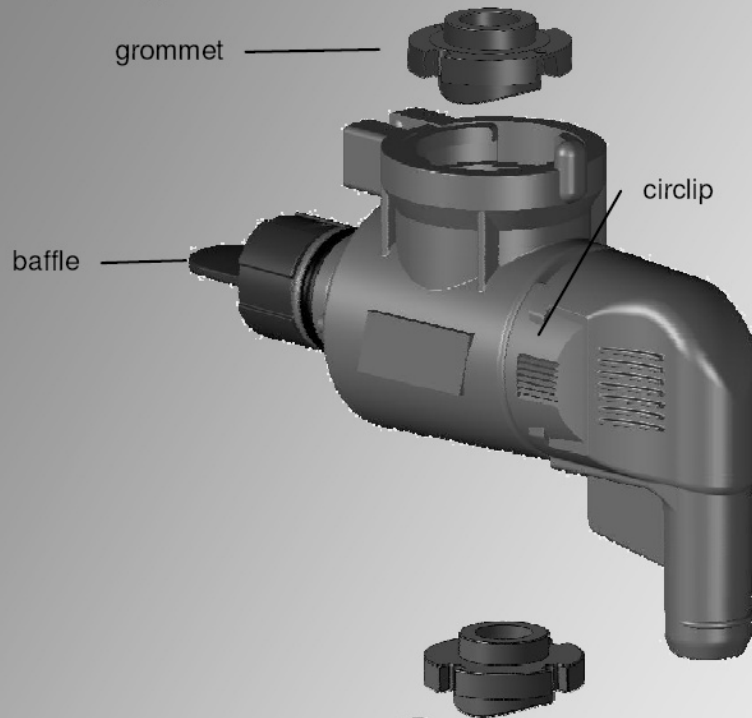


- ▶ **Annual Service Kit**
 - Gaskets
 - Valve Assembly
- ▶ **Broken baffle in valve**
 - Will calibrate
 - Poor mixing and washing
- ▶ **Plastic T-Piece**
 - Easily broken
 - \$18.88 repair
- ▶ **Store with valve in Milk Position**

Tru-Test Ezi-Test - Maintenance

Tru-Test

Improved WB Ezi-Test / Mini-Test Sampling Valve



- ▶ **New Stronger Valves in 2010**
- ▶ **Must replace whole valve**
- ▶ **Dark Charcoal in color**
- ▶ **Should reduce broken wash baffle issue**

Tru-Test Auto-Sampler



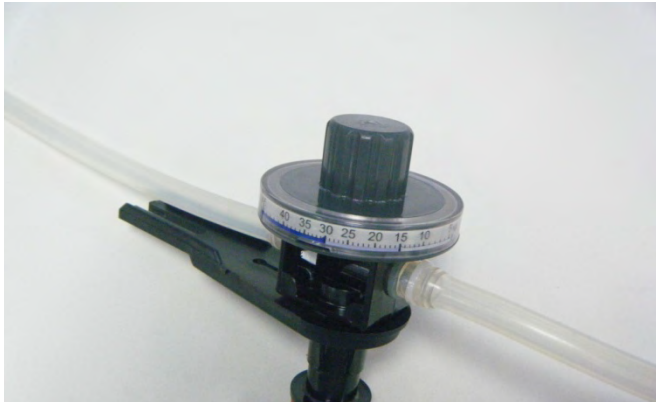
- ▶ Mixing and sampling with push of button
- ▶ Labor-efficient
- ▶ Standard Bore (old) or Wide Bore (new) models
- ▶ High cost of ownership
 - Multiple service kits
 - Cap, sampler, valve and body damage

Tru-Test Auto-Sampler - Maintenance



- ▶ **Annual Service Kit**
 - Gaskets
 - Valve Assembly
 - Sampler Button
- ▶ **Broken baffle in valve**
 - Will calibrate
 - Poor mixing and washing
- ▶ **Store with valve in Milk Position**

Tru-Test Auto-Sampler – Sampler Dial

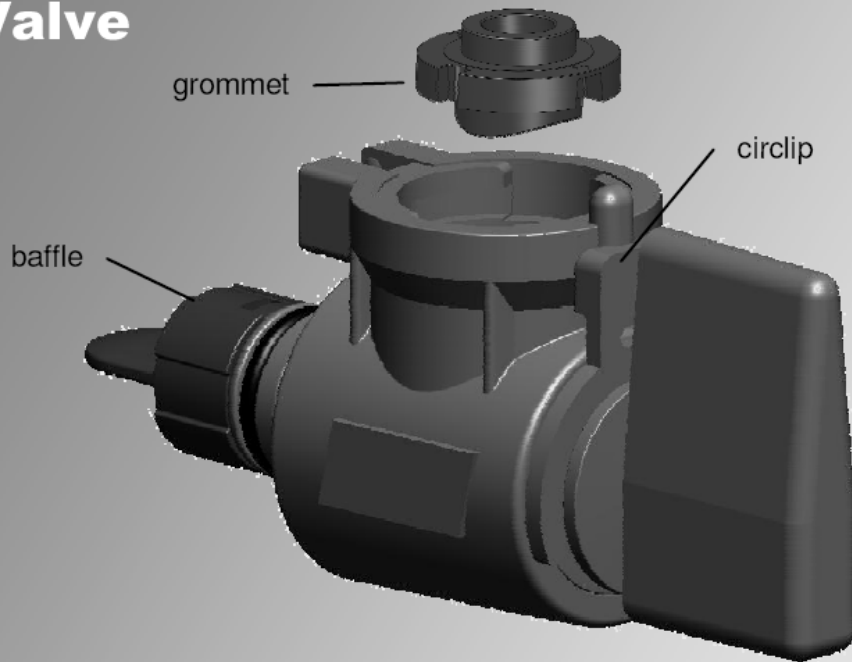


- ▶ **New Calibration Label**
 - Weight Levels
 - Zones – Low/Med/High
- ▶ **New Ring**
 - Snap Fit
- ▶ **Dark Grey in Color**

Tru-Test Auto Sampler - Maintenance

Tru-Test

**Improved WB Auto Sampler
Valve**



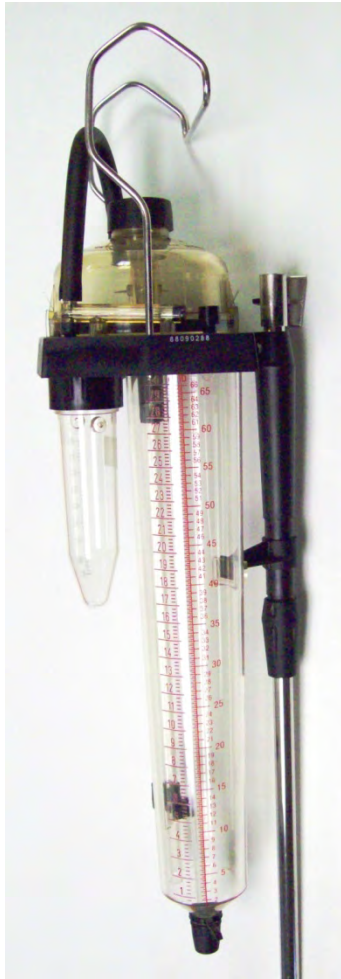
- ▶ **New Stronger Valves in 2010**
- ▶ **Must replace whole valve**
- ▶ **Dark Charcoal in color**
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Tru-Test Farmer and Econo-Valve



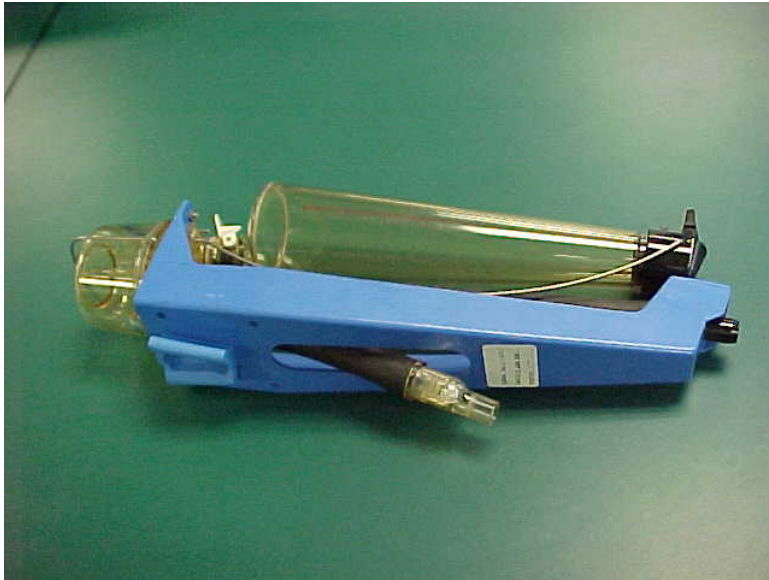
- ▶ Only Standard Bore models
- ▶ Over 20 years old
- ▶ No parts available
- ▶ Poor image of DHI
- ▶ Still approved but should be removed from service!

Foss Milko-Scope



- ▶ **Volumetric Meter**
- ▶ **No longer manufactured but DeLaval owns patent**
- ▶ **Reliable and accurate**
- ▶ **Durable except for bracket**
- ▶ **Larger vacuum drop**
 - **Larger dome**
 - **Small inlet (similar to SB)**

Waikato MK V



- ▶ Same mode of operation as Ezi-Test
- ▶ Annual Service Kit
- ▶ Don't forget to replace inlet hoses
- ▶ Durable
- ▶ Larger vacuum drop
 - Larger dome
 - More prevalent in large parlors

Waikato SpeedSampler



- ▶ Annual Service Kit
- ▶ Sampler Service Kit
- ▶ Don't forget to replace inlet hoses
- ▶ Check all hoses for cracks or leaks
- ▶ Check bungs for wear and ensure lifter arm is properly positioned

Unapproved DHI Meters – Mini-Test



- ▶ **Not ICAR Approved**
- ▶ **Weighing and sampling accuracy does not meet tolerances**
- ▶ **Farmer Use only**
 - **SCC checks between test days**
 - **Does not matter what test plan – cannot use for DHI**

Unapproved DHI Meters - TeSa



- ▶ Never ICAR Approved
- ▶ Weight principle vs. volumetric principle
- ▶ Limited parts available
- ▶ **National DHIA/QCS acceptance expires on December 31, 2010**

Unapproved DHI Meters - Bodmin



- ▶ **Never ICAR Approved**
- ▶ **Significantly sampling issues**
 - **Milk fat variance as high as 52%**
 - **SCC variance as high as 34%**

Unapproved DHI Meters - Flaco



**PROPORTIONAL
MILK-METER**

- ▶ Imitation Waikato meter manufactured in China
- ▶ Not ICAR approved
- ▶ Accuracy and parts quality questionable

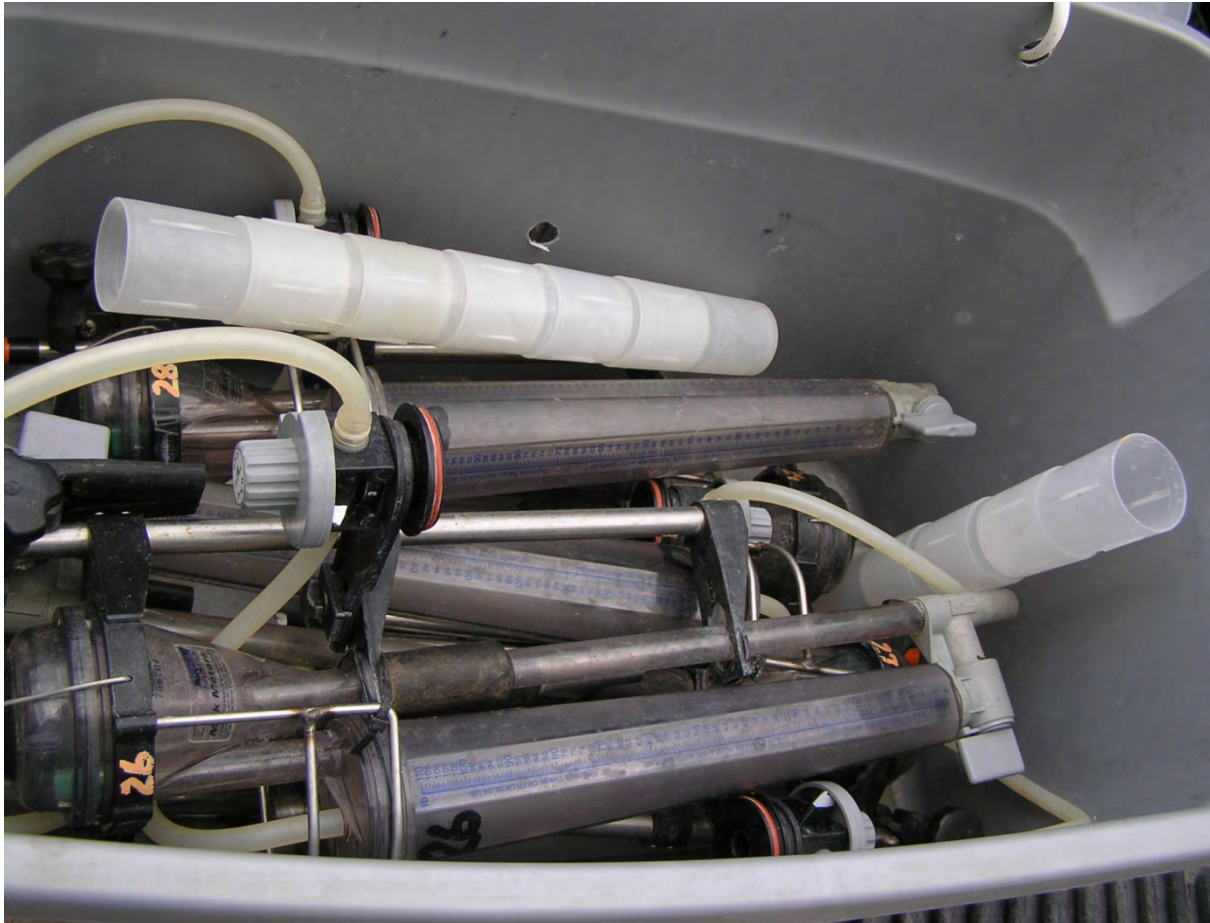
Meter Repair Tags

- ▶ Space for Tester Name, Date & Problem
- ▶ Quick ID of the problem
- ▶ Reduces down time
- ▶ Trace back



Meter Storage and Transport

Meter Storage



Plastic totes provide convenient storage of up to 10 meters

Meter Storage & Transportation



Totes are easily carried into milk barn for setup

Totes cost approximately \$8

One replacement meter costs approximately \$350

CARE AND MAINTENANCE OF PORTABLE METERS – SIEVERT 2011

Meter Storage & Transportation



Truck bed cover keeps everything secure

Truck cover=\$900

30 stolen meters=\$10,500



Trailer transport for large herds

Meter Storage & Transportation



PVC pipe racks

Holds 8 meters with Super Clamps

Easy transport and upright storage

Plans in Meter Technician Manual

Meter Storage & Transportation



PVC pipe racks

Holds 10 meters with Dovetail Brackets

Easy transport and minimal damage (if any)

Meter Mask



Protects against meter body damage from teat cups and premature meter draining

Meter Mask= \$20.00

Meter Body=\$180.00

Heavy Duty Meter Cleaning



Cleaning and Sanitizing of Portable Meters

How clean are your meters?



Initial Testing

- ▶ The first tests were done in the field by three technicians.
- ▶ Meters were “swabbed” prior to sanitizing, after sanitizing, and after usage and being washed.
- ▶ All meters appeared to be clean.

We wanted to see what would grow if we swabbed and cultured various parts of TruTest Meters that appeared to be clean

Dairy One Cooperative Trial

- ▶ An additional trial was done in Ithaca to gauge the effectiveness of sanitizing in relation to time
- ▶ We did “time trials” to gauge the optimum amount of contact time for sanitizing



Dairy One

Meter Swabs



Valve Swabs as well...



Raw Data Recording

Pull Out Meter	Cover O Ring	VSO (Top)	Body
30 seconds	8	7	9
60 seconds	10	11	12
90 seconds	13	14	15
120 seconds	16	17	18
0 seconds	4	5	6
Valve Meter (EZI Test)	Inner Valve	Inner O Ring	Air Admisson
30 seconds	20	21	19
60 seconds	25	24	22
90 seconds	26	27	25
120 seconds	29	30	28
0 seconds	2	3	1
"Cruddy O Ring"			
New O Ring	✓	✓	✓
X Meter 026	31	32	33
X Meter 202	34	35	34

Initial Findings

- ▶ **We were able to culture and grow many organisms from meters that had been washed immediately after use and appeared to be clean. The field trial and the Ithaca Center trial yielded similar results.**
- ▶ **Meters that were cultured after being sanitized according to product specifications* were significantly less likely to be contaminated.**
- ▶ *** Two minutes contact time, 1 oz sanitizer/12 gallons lukewarm water**

Conclusion:

- ▶ **Sanitizing for two minutes just prior to the start of milking is necessary to insure our meters are clean, unless the meters will be connected and run through the dairy's regular sanitizing cycle.**

Additional Findings

- ▶ **The VSO must be removed after each use.**
- ▶ **The nozzle and cap o-ring must be removed regularly.**
- ▶ **The o-rings on valve meters need to be cleaned regularly.**
- ▶ **The rubber parts of the meters should be replaced on a planned schedule, suggest at meter test anniversary.**

Findings on Residual Milk from Flask

- ▶ Several trials were conducted on the extra flask milk.
- ▶ In every case the culture results were TNTC- too numerous to count. Extra flask milk must not be added to the tank by Dairy One technicians*, and dairies should be discouraged from doing it as well.

* Dairy One Milk Handling Policy

The long Handled Hose brush can be used to remove the nozzle



The “bent” brush will fit into the meter body for cleaning.



Don't forget the hoses...



Cleaning Meters in Place (CIP)

- ▶ **Add 1 gallon water and proper detergent for each meter in the line**
- ▶ **Physical cleaning of outside**
- ▶ **Clean the super clamp to ensure proper function**
 - **Air hose to remove debris**
 - **Immersion in hot water and detergent**
 - **Lubricant on metal only – not on polysulfone!**

Care of meters

■ Avoid contact with:

- ✓ Direct Sunlight
- ✓ Petrochemicals & Hydrocarbons such as:
 - Fly spray
 - Brake or hydraulic fluid
 - WD40
 - Lubricants
 - super glue
 - Alcohols
 - Fuels

Proper Sampling and Reading

Sample Mixing Research

- ▶ Minnesota DHIA Trial
- ▶ Used Tru-Test Pull-Out meters with 68# & 102# meters
- ▶ Removed flasks during milking, mixing thirds before sampling
- ▶ Simply poured milk without mixing



58# milk in 102# Meter

poured without mixing

	<u>Fat %</u>	<u>MUN</u>	<u>Prot %</u>
Top	7.1	14	2.6
Middle	2.9	18	2.7
Bottom	2.6	19	2.7

51# of milk in 68# meter

	<u>Fat%</u>	<u>MUN</u>	<u>Prot %</u>
Last 8#	9.9	16	3.0
Middle 22#	4.0	18	3.5
First 21#	2.4	22	3.6

65# of milk in 102# meter

	<u>Fat %</u>	<u>MUN</u>	<u>SCC</u>
Last 11#	6.03	14	722,000
Middle 19#	3.63	15	252,000
First 15#	1.65	21	188,000

37# of milk in 68# meter

<u>Poured 2x</u>	<u>Fat %</u>	<u>MUN</u>	<u>SCC</u>	<u>Prot %</u>
Top	3.76	15.3	62,000	3.19
Middle	3.75	15.5	63,000	3.19
Bottom	3.76	15.1	57,000	3.18

Findings on Sample Mixing

- ▶ **Employ proper mixing of flask milk for every cow**
 - **Pull-Out Flasks – minimum of 2x**
 - **Ezi-Test Meters – 10 seconds if flask is more than ½ full**
 - **Ezi-Test Meters – 5 second if flask is less than ½ full**
 - **Waikato Meters – 10 seconds**
 - **May need to be twice as long in cold weather/cold parlors**

- ▶ **Fill sample vials immediately and shake to disperse preservative**

- ▶ **DHIA labs have protocols in place for sample handling and mixing before analysis**

Reading the Flask Volume



- ▶ Read the **BOTTOM** of the meniscus
- ▶ **Foam does NOT count**
- ▶ Read between the lines
 - 1 lb marks – read to ½ lb
 - ½ lb marks – read to ¼ lb
- ▶ **Consistent reading from start to finish**
- ▶ **Replace worn flasks**

Your Challenge is...

▶ You control your image...

- *Professional appearance*
- *Properly operating equipment*
- *Proper technique*
- *Exceed the minimum requirements*
- *Communicate your needs with management*

▶ Resulting in...

- *Accurate and consistent results*
- *Fewer concerns and/or complaints from dairymen*
- *Customer retention and satisfaction*

Quality Certification Services Inc.

- Performance & Quality Standards
- Compliance Auditing of Providers
- Education, Training, & Development

A simple, yet vital mission....

Providing a reliable source of information to people interested in the U.S. dairy records industry.