Auditing Procedures for Meter Centers and Technicians

2018 Meter Technician Training School

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Technical Director, National DHIA
Chair, ICAR Subcommittee for Recording and Sampling Devices

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Quality Certification Services Inc.

Topics to cover today

- Certification and Audit Definitions
- Changes in the Auditing Guidelines
- Meter Center and Meter Technician Auditing Procedures
- Observations from Meter Center Audits

Quality Certification Services is a wholly-owned subsidiary of National DHIA

Your QCS Team

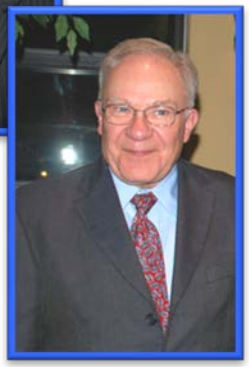
Jay Mattison – CEO

Steven Sievert - Manager, Field & Meter Center Auditor

Leslie Thoman – Accounting

Independent Contractors

Paul Sauvé - Laboratory Auditor



Gerald Steuernagel - DPRC Auditor

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QCS Quality Certification Services Inc.

ROLE OF QUALITY CERTIFICATION IN THE DHI INDUSTRY

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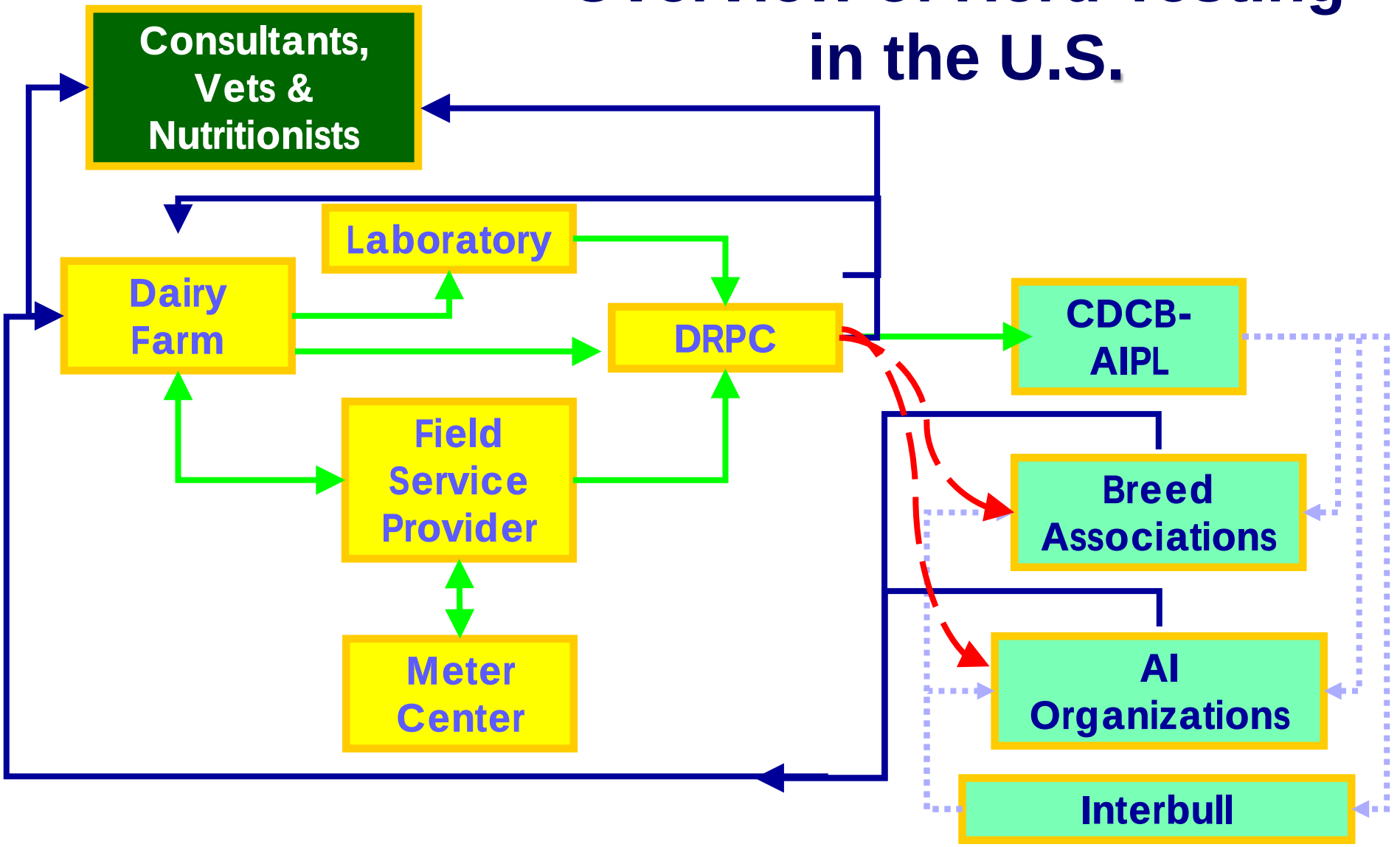
Areas of Work

Auditing of Providers

Support & Program Development for All Providers

External Industry Liaisons

Overview of Herd Testing in the U.S.



Common Complaints from Dairymen

- Field Technician does not show up on time
- Field Technician does not test regularly (desire monthly testing)
- Field Technician appearance/behavior is not professional
- Field Technician is not mixing samples properly
- Sample ID accuracy
- Meters do not operate properly
- Meters are dirty
- Meters are old (or appear to be old)
- Lab accuracy and turn-around time
- Data entry errors/handling
- Data turn-around time

Quality Certification in the United States

Program is user-driven

- Guidelines developed by service providers for each area
- Review and recommendation by Audit Review Committee (ARC)
- Approval by Council on Dairy Cattle Breeding (CDCB)
  - Records Providers (DRP-DHI)
  - Dairy Records Processing Centers (DRPC)
  - Breed Associations (PDCA)
  - A.I. Organizations (NAAB)

Our Mission

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

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QCS Auditing Program in 2017

- 22 Field Service affiliates working with 1,874 Field Technicians and Technician Assistants (includes full time, part time, and ISPs and their staff)
- 37 Meter Centers and 75 Meter Technicians that calibrated 72,193 certified portable meters in 2017
- Dairy operations using 149,238 certified electronic on-farm meters
- 43 Laboratories analyzing an average of 5.11 million milk samples monthly
- 4 Dairy Records Processing Centers (DRPC) processing cow data
- 17 ELISA Laboratories screening milk samples for Johne's

QCS Support and Program Development

Working with Advisory Committees

Advisory Committees to review guidelines for each sector, to assure program relevance, and incorporate new technology where appropriate

QCS Advisory Committee	Terry Hopper, Dairy Lab Services, Chair
Field Service Advisory Committee	Anita Quesenberry, United DHIA, Chair
Laboratory Advisory Committee	John Rhoads, Eastern Laboratory Services, Chair
DRPC Advisory Committee	Bill VerBoort, Agritech Analytics, Chair
Audit Review Committee	Bruce Dokkebakken, Minnesota DHIA, Chair

CDCB Committee

Pursuing Data Quality (PDQ) Team	Steven Sievert represents National DHIA Angie Coburn represents AgSource Coop DRPC

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Providing Leadership to ICAR

THE GLOBAL STANDARD FOR LIVESTOCK DATA

Network. Guidelines. Certification.

Jay Mattison, National DHIA
President, ICAR Board of Directors

Steven Sievert, National DHIA
Chair, Recording & Sampling Devices Subcommittee

Chair, Sensor Devices Task Force

John Rhoads, Eastern Lab Services
Milk Analysis Subcommittee

Kevin Haase, NorthStar Cooperative
Dairy Cattle Milk Recording Working Group

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Working with Milking Equipment Manufacturers

Multifaceted approach working directly with manufacturers and with local dealers to support needs of our field service affiliates

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Working with Laboratory Vendors & Suppliers

BENTLEY INSTRUMENTS

FOSS

Perten INSTRUMENTS a PerkinElmer company

DeltaInstruments, NORTH AMERICA
An Advanced Instruments, Inc. Company

IDEXX LABORATORIES

DNA DIAGNOSTIC

CPP

Capitol Vial

applied biosystems
by Thermo Fisher Scientific

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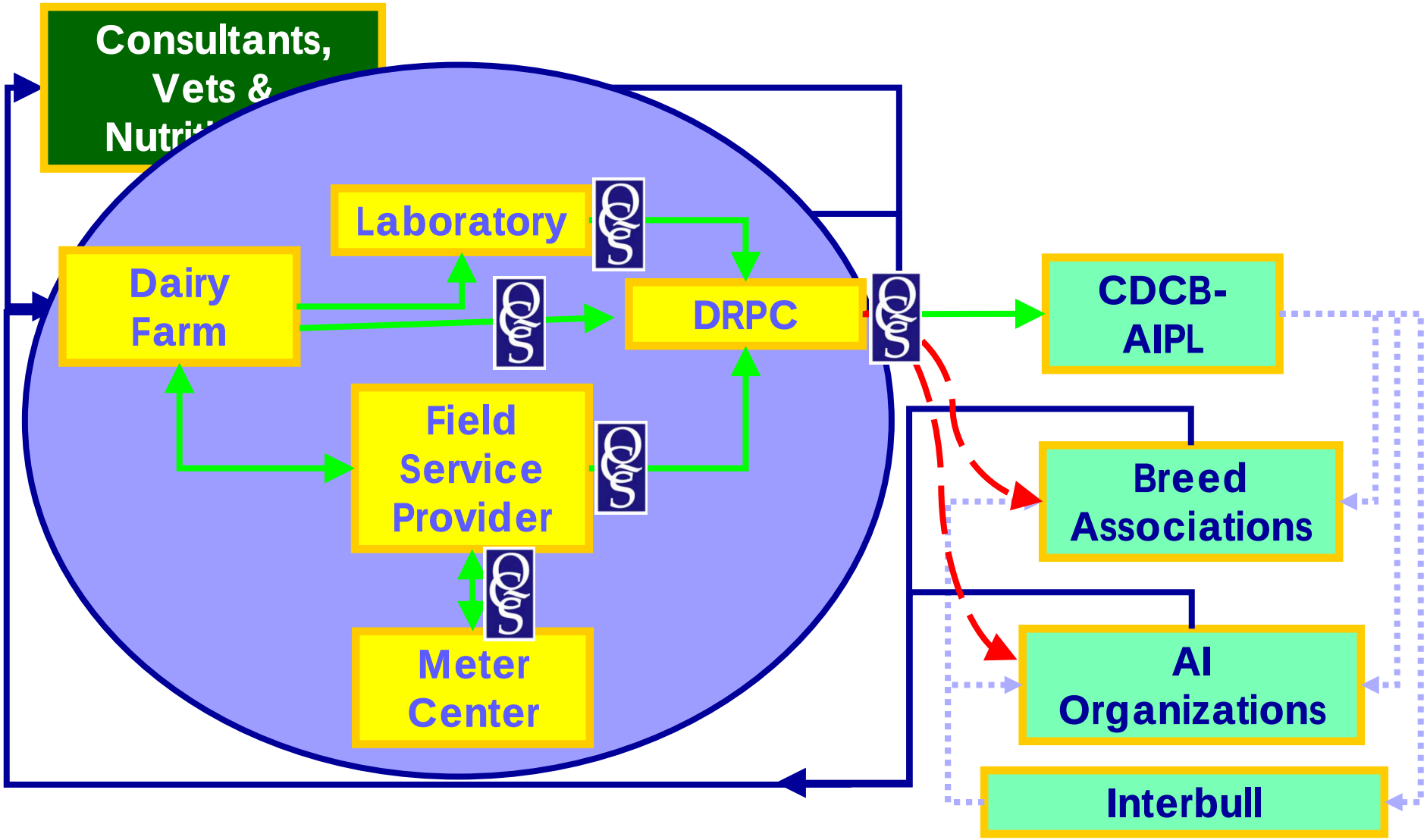
Assuring Data Accuracy is the Role of QCS



What are the Meter Centers?

NorthStar Cooperative INC.

Select Sires · AntelBio · DHI

Certified Meter Centers

Calibration of Meters a Priority

- 40 certified meter centers in the U.S.A and Mexico
- 80 certified meter technicians
- Meters must be calibrated every 12 months (not 14)
- Uniform calibration and performance guidelines

Meter Center Audits

- Every 2 Years
- Portable & Stationary Calibration Centers

Meter Technician Audits

- Every 2 Years
- Maintenance/Calibration

Meter Technician Training

- Required Every 5 Years
- Manufacturer Supported

QC – Everyone's Responsibility

- Accuracy and reliability of data
- Levels the playing field for all providers
- Independent of size, structure or geographic location
- Dairies, Studs, Breed Associations, etc. all trust us to do the job right
- Quality data at the dairy level to make educated decisions

The Challenge is…

- **You control your image…**
  - Professional appearance
  - Properly operating equipment
  - Proper technique
  - Exceed the minimum QC requirements
  - Communicate your needs with management

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

CERTIFICATION STATUS DEFINITIONS

Reference Documents

Council on Dairy Cattle Breeding

General Auditing Guidelines

Effective January 1, 2010
Version 10.0

The purpose of this manual is to ensure the accuracy and uniform
records included in the national *Genetic Evaluation Progra*

NATIONAL DAIRY HERD IMPROVEMENT PROGRAM
UNIFORM OPERATING PROCEDURES

Effective June 1, 2014

CODE OF ETHICS

PURPOSE
This *Code of Ethics* provides guidelines for appropriate conduct in the production, collection, and distribution of DHI information for all individuals and organizations involved with these data.

UNETHICAL PRACTICES

A. Impairing the reliability of DHI data.
B. Not cooperating or interfering in the use of the *Uniform Data Collection Procedures* to record DHI data.
C. Intentionally providing inaccurate data or withholding necessary data resulting in misrepresentation of DHI information.
D. Engaging in management practices with the intent of misrepresenting the performance of individual animals and/or the herd. Among these practices, but not limited to, are the movement of animals between herds, influencing the relative performance of herd mates, and/or the selective use of management techniques in an effort to bias DHI data. Management practices on test day should be representative of normal practices used on other days.
E. Permitting the collection of supervised data by a technician with a direct financial or family interest in the herd being tested without notification to and consultation with the field service auditor.
F. Any practice defined as fraudulent or unethical by the Board of Directors of National DHIA.

REMEDY
Any person, corporation, or other entity violating this *Code of Ethics* may be subject to action by an injured party.

UNIFORM DATA COLLECTION PROCEDURES

PURPOSE

The purpose of these procedures is to provide the framework for a uniform, accurate system that will enhance data reliability.

The uniform records and data thus provided are used for:

- Making farm management decisions
- Genetic evaluation of cows and sires
- Educational programs and research
- The promotion and sale of animals

AUTHORITY

These *Uniform Data Collection Procedures* have been developed and adopted under the direction of National DHIA.

A Cooperative Agreement exists between the United States Department of Agriculture (USDA), Agricultural Research Service (ARS) and the Council on Dairy Cattle Breeding (CDCB) to ensure the flow of DHI data for industry purposes including genetic evaluation programs.

RESPONSIBILITY

DHI service providers, DHI personnel, and dairy herd owners, as well as persons in their employ, are individually and collectively responsible for adherence to these *Uniform Data Collection Procedures*.

These basic and minimum standards are to be uniformly followed throughout the DHI program. They serve to ensure that DHI data will provide the accuracy, uniformity, and integrity essential to all segments of the dairy industry.

All DHI service providers - field service providers, laboratories, meter centers, and dairy records processing centers (DRPC) - must maintain certification by Quality Certification Services to verify compliance with these *Uniform Operating Procedures* and the guidelines for their specific service area.

To participate in the DHI program a dairy producer must agree in writing (membership or service agreement as applicable) to conform to these *Uniform Data Collection Procedures* and *Code of Ethics*.

DEFINITIONS

DAIRY COW is defined as any cow from which milk production is intended for use or sale for human consumption, or which is kept for raising replacement dairy heifers and is an integral part of the dairy herd.

DAIRY HERD is defined according to the following principles that are generally appropriate for herds enrolled in the DHI program:

- All cows of one breed, housed or managed under a single management system, regardless of individual cow ownership
- Farms with two or more distinct breeds may calculate and report either a composite herd average or a separate herd average for each breed

In general, herd codes should be assigned in accordance with the principles stated above. However, it is recognized that legitimate exceptions may exist that warrant assignment of separate herd codes. For example:

- A herd owner may operate separate units under separate management systems, with no movement of cows between these management units.
- If two groups of cows are housed together but with different ownership, management goals, and with no movement of cows from one ownership group to the other; one owner may wish to participate in the DHI program and the other owner may not.
- Farms with two or more distinct breeds may enroll one breed in the DHI program and not the other(s).

DHI Field Service Providers shall only assign herd codes from state/county lists allocated by National DHIA in order to prevent duplication among providers. In so far as possible, herds should be assigned herd codes designating the state/county location where the herd resides.

TEST is defined to be the entire process of information collection at the farm, and may include some or all of the following: weighing of milk during the milking process, electronic collection of milk weights, collection of milk samples, and collection of other data. Since the actual testing of milk samples does not occur at the farm, this procedure should be labeled as the laboratory test.

TEST DAY is defined as the 24-hour period during which data is recorded and milk sampled. Herds recording daily milk yield on the dairy are permitted to use longer intervals (most commonly 5, 7, or 10 days) to estimate 24-hour test-day production if accurately labeled.

DHI TECHNICIAN This and equivalent terms such as supervisor, tester, independent service provider, etc. defines persons approved by the DHI Field Service Provider responsible for data collection that meets the standards described in the Uniform Operating Procedures.

DHI SAMPLE TAKER – This and equivalent terms such as assistants, technicians, helpers, etc. defines persons supervised by and responsible to the DHI Technician, and ultimately to the DHI Field Service Provider, that assist in data collections on farms. DHI Sample Takers should be trained by the DHI Field Service Provider in a

Council on Dairy Cattle Breeding

Auditing Procedures for Meter Centers and Technicians

Effective July 29, 2014
Version 14.0

ose of this manual is to ensure the accuracy and uniformity of all
ords included in the national *Genetic Evaluation Program.*

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Quality Certification Services Inc.

Certification Status Definitions

- ***Certified***

  A “certified” provider is one that in compliance with the Council on Dairy Cattle Breeding (CDCB) guidelines and the Uniform Operating Procedures (UOP) for its service area.

- **Provisional**
- **Conditional**
- **Decertified**
- **In Review**

Certification Status Definitions

- Certified
- ***Provisional***

  A provider is not in compliance with one or more aspects of the CDCB guidelines and/or the UOP will be deemed as "provisional." Upon coming into compliance and review by the auditor, the provider may be:
  - **restored to full certification,**
  - **designated conditional until an audit is conducted,**
  - **designated provisional for an additional period of review, or**
  - **decertified.**
- Conditional
- Decertified
- In Review

Certification Status Definitions

- Certified
- Provisional
- ***Conditional***

  A “conditional” certification status may be assigned to both new and existing service providers. A new service provider may be assigned conditional status if the auditor believes that the provider has demonstrated competency to perform necessary procedures meeting CDCB guidelines and/or the UOP, but has not undergone a full on-site audit. An existing provisional provider may be assigned conditional status if the auditor believes that the provider has met all conditions or deficiencies outlined as part of a previous audit.

- Decertified
- In Review

Certification Status Definitions

- Certified
- Provisional
- Conditional

- ***Decertified***

  A provider that is out of compliance with the CDCB guidelines and/or the UOP, even after a period of provisional certification and review, will be "decertified" by the auditor. A decertified provider will not be allowed to submit data to the Genetic Evaluation Program. Further, data for management purposes will be designated as 'non-certified.'

- In Review

Certification Status Definitions

- Certified
- Provisional
- Conditional
- Decertified

In Review

A provider may be listed as 'in review' on the website. This is not an official certification status, but simply a temporary designation used while the audit is being conducted and data evaluated. During this review period, the auditor may request additional documentation from the provider. The length of the review process is not an indicator of certification status and should not be construed as such.

DEFINITION OF AUDIT TYPES

Audit Definitions

- **Off-Site (applies to Field Service and DRPCs only)**
- **On-Site**

Mandatory

- **Regularly scheduled audit conducted during the centering month**

Discretionary

- **Deemed necessary by either the auditor or provider when:**
  - **Changes in facilities, equipment, or staffing have occurred,**
  - **Certain aspects of the provider's performance are out of compliance with CDCB guidelines and/or the UOP,**
  - **Provider wishes to attain full certification from a conditional status,**
  - **Provider wishes to regain full certification from a provisional status, or**
  - **Provider wishes to regain provisional certification from a decertified status**

CHANGES IN THE AUDITING GUIDELINES

Changes in the Guidelines

- **All changes originate with Field Service Advisory Committee (FSAC)**
  - ***Anita Quesenberry (United DHIA) is chair***
- **Sent to Audit Review Committee (ARC) for review and approval**
  - ***Bruce Dokkebakken (Minnesota DHIA) is chair***
- **Final approval by CDCB Board of Directors**

Changes in Auditing Guidelines

- No proposed changes in guidelines from the field.
- There is one ICAR-certified portable meters to add to list of approved models for cows.
  - Lactocorder LC-S (also sold by Tru-Test as Lactocorder T-T)
  - Will need additional development time before actively sold in USA
  - Calibration will require a new wand with new flow reducer
- Guidelines for Meter Centers and Technicians need to be refreshed and restructured – propose review in 2018 and present at 2019 FSAC.
- Still significant number of older Tru-Test standard bore (yellow) & FOSS Milko-Scope meters in service – need to have a business plan to retire these meters.

Calibration Wand Requirements

Required Use of Manufacturer's Approved Wand – January 1, 2012

- **Standard Flow and Dual Meter Procedures - new wand available from Waikato USA**
- **Fast Flow Procedure – wand available from Tru-Test.**
- **No PVC wands – breakage, air leaks, etc**
- **Closed jar-to-jar systems for are okay with auditor's approval**

Standard Flow Calibration Wand

- Waikato and QCS met in August 2010 on development of stainless steel ‘standard-flow’ calibration wand
- Works with Tru-Test pail and existing mounting brackets
- Includes restrictor, air admission orifice
- For all standard flow and dual-meter calibration procedures
- May be used for Tru-Test, FOSS & Waikato meters
- Required by January 1, 2012
- Available from Waikato Milking Systems USA

Meter Technician Training

Meter Technician Training Requirement

- **In order to retain certification, each meter technician is required to attend a meter technician training school approved by the auditor at least once every five years.**

- **Ensures that all meter technicians are current with respect to meter repair and maintenance along with providing a venue for exchange of ideas/tips/experiences between meter technicians.**

Service Provider Responsibilities

Service Provider Responsibilities

- To notify the auditor of changes in ownership, location address, billing address, list of customers and/or affiliates, equipment or meter technicians **within 30 days.**

- To pay the fees charged by the auditing organization prior to issuance of certification. For those providers certified biennially, but billed in annual installments, certification will be issued on an annual basis with a renewal on receipt of the second installment payment.

AUDITING PROCEDURES

General Audit Information

- **Biennial, on-site mandatory audits for all meter centers**
  - **Stationary**
  - **Portable**
- **Designated centering months**
  - **26-month certification period**
  - **Annual fees must be paid to receive certification for the 2nd year**
- **Discretionary audits for:**
  - **New meter centers and technicians**
  - **New calibration equipment or new calibration procedures**
  - **Provisional or conditional providers in order to regain certification**

Basic Meter Center Equipment

- Current meter manuals
-
- Parts supply for meter repair/maintenance
- Clean, solid, well-built and in good repair
- Initial volume verification
  - Volumetric flask or digital scale
- Ongoing volume confirmation
  - Working & accurate scale, properly working float pail
- Stable vacuum source @ 15” Hg with short recovery time (<10 seconds ideal)

Standard Flow Water Test Equipment

- Restrictor orifice at the inlet of wand
  - Fixed diameter, ahead of air admission orifice
- Air admission orifice in the calibration wand
  - 24-36” from meter inlet
  - #60 drill bit size hole in wand
- Level and secure hanging bracket
- No set meter height (standard flow test only)
  - New wand uses same height at Fast Flow Procedure
- Flow rate
  - 8 lbs./minute or about 4:34 for 36.4 lbs

Dual Meter Water Test Equipment

- Same equipment as Standard Flow Equipment
- Requires adequate vacuum reserve capacity
- Air admission orifice in the calibration wand
  - 24-36” from meter inlet
  - #60 drill bit size hole in wand
- Level and secure hanging bracket for both meters
- Second hose connecting first and second meters
  - 24-36” from outlet of meter #1 to inlet of meter #2
  - No air admission orifice in the second hose
- Flow rate
  - 8 lbs./minute or about 4:34 for 36.4 lbs

Fast-Flow Water Test Equipment

- Tru-Test and FOSS meters only
- Approved Fast Flow rig
- Pail with anti-vortex baffle
- Level and secure hanging bracket
- Straight inlet tube w/ castellated orifice
  - 63” from inlet opening to top of meter flask
- Flow rate for 16.0 liters
  - 58-63 seconds for wide bore meters
  - 68 seconds for standard bore meters

Weight Test Method Equipment

- Weights accurate to 2%
- Weights capable of checking:
  - 10 – 20 – 30 – 40 – 50 pound checkpoints
- Approved scale models only
  - American Weigh-Scales, Chatillon, Detecto, Hansen, Pelouze, Salter-Brucknell, Stewart-Oster, Taylor-Wharton
- If calibrating scales for goats…
  - need to also have 1, 2, and 5 pound weight checkpoints

Meter Technician Audits

- **Verification of training**
  - **Attendance at QCS Meter Technician Training School once every five years**
  - **Attendance at local affiliate and/or manufacturer sponsored workshops**

- **Must demonstrate all test methods used in meter center**
  - **Standard Flow**
  - **Dual Meter (not every meter center can run this)**
  - **Fast Flow**
  - **Weight Test (if hand scales are in use)**

Meter Technician Audits

- Demonstration of proper number of calibration checks
  - 1 time if within 2%
  - 2 times if within 2-3%
- Demonstration of meter repair/maintenance
- Demonstration of meter identification, record keeping and data recording

Meter Technician Certification

- Certification is meter model specific
  - *TeSa Milk-o-Meter – expired December 31, 2010*
  - Foss Milk-O-Scope
  - Tru-Test Auto Sampler models
  - Tru-Test Economy models
  - Tru-Test Electronic milk meters
  - Tru-Test Ezi-Test models
  - Tru-Test Farmer models
  - Tru-Test Pull-Out models
  - Waikato Mark 5
  - Waikato SpeedSampler

OBSERVATIONS FROM METER CENTER AUDITS

Certified DHI Portable Meters – 2017

Model	Model	2013	2014	2015	2016	2017
FOSS	Milko-Scope	96	31	31	33	32
Tru-Test	Auto Sampler (SB & WB Models)	18,518	17,558	16,884	16,903	15,784
Tru-Test	Economy (SB)	1,881	1,742	1,313	1,097	643
Tru-Test	Electronic Milk Meter	426	405	450	550	542
Tru-Test	Ezi-Test (SB & WB Models)	8,418	8,624	8,917	8,648	7,748
Tru-Test	Farmer (SB)	3,918	3,278	2,993	2,793	1,835
Tru-Test	Pullout (SB & WB Models)	41,902	39,873	39,105	39,174	36,784
Waikato	MK V (includes farmer-owned)	8,916	8,745	8,846	8,817	8,716
Waikato	SpeedSampler	186	179	168	132	109
Total		84,261	80,435	78,707	78,147	72,193

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Note – Two (2) Field Services completed substantial meter inventory reduction and reallocation in 2017

Portable Meter Calibration Performance in 2017

** Meters are required to be calibrated at least once every 365 days*

** There were 2 field service providers with 100% of meters with calibration intervals <365d in 2017*

	Best Service Provider	Poorest Service Provider	2016 Weighted Mean	2017 Weighted Mean
Not Calibrated	0%	38.1%	0.8%	1.1%
% <365 days	100%*	0%	52.7%	54.1%
% between 365-425 days	0%	0%	35.0%	36.7%
>425 days	0%	100%	12.3%	8.1%

Portable Meters and Scales

- **Inventories are either excellent or poor**
  - **Accuracy in reading serial numbers**
  - **Recording model types**
  - **Status – In? Out? Storage?**
  - **QCS can handle multiple calibration dates**

- **Record weights from <u>all</u> calibration runs**

- **12 month interval is requirement!**
  - **Audit guidelines allow 14 months 'in certain cases'**
  - **More prevalent problem with ISP technicians**

Usage of Meters

Field Service Affiliate	No. Meters	Cows/Meter/Year	Times Calibrated/Year
A	3,131	896	4x to 12x
B	4,965	2,429	1x
C	5,708	1,301	1x to 2x
D	10,511	882	1x
E	1,307	1,068	1x
F	2,076	694	2x
G	364	4,185	1x
H	184	6,916	2x

Availability of Meters and Parts

- **Meter centers with different meter models need to have at least one functioning meter of each model available during the audit**

- **Parts need to be available for both routine maintenance and repairs – especially if needed during the audit**

Eight (8) meter center audits in the last three years had to be rescheduled due to lack of parts or failure to have meters models in use available at the audit

If we cannot calibrate it or fix it – how can we certify it?

Use of Float Pails

- Float pails are used to verify water volume between calibration runs
- Many of the floats are broken or cannot be adjusted
- An affordable alternative is the use of a digital scale to verify both initial and intermediate water volume
- Improves accuracy and potentially reduces repair costs

Condition of Equipment

- Aging meter centers and equipment
- Check hoses for wear, air leaks, cracks
- Maintenance of vacuum pumps a concern in some meter centers
- Take care of your wands
  - Damaged wands
  - Worn castellated orifices
  - Worn shut-off valves that leak air

Post-Calibration Meter Procedures

- An important part of meter calibration includes what happens after the run
  - 2nd runs if needed (<35.5 lbs. or >37.1 lbs.)
  - Recording data – all calibration results
  - Identifying with certification tag/sticker

- Lost calibration worksheets, no backup files – this delayed/affected 4 field service audits in 2015 and 2 field service audits in 2016

Record Your Observations

- **Parts replacements**
  - **Annual Service Kits**
  - **Other parts (caps, nozzles, T-Pieces, etc.)**
- **Verify the model of meter and record any corrections**
- **Meter condition and cleanliness**