What Next? How to Ensure Milk Recording Services are Prepared for the Challenges to Come

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Challenges in Modern Herd Recording

Are We Listening?

Dairy cattle are ideal candidates for repeated measures

- What can I tell you?

Producers have more data on farm today than ever

- How are you going to use my farm/herd data?

Recording organizations are looking for guidance

- What do we do?
Current RSD-SC Goals & Priorities

- Updates to Section 11 & Addition of Sensor Device Guidelines
- Delivery of Device Routine Procedures to Members
- Standardization/Innovation in Testing of AMS/VMS
- Innovation in Testing Sensor Devices/Systems
- Separation of Goats & Sheep with New Standards
- Revisions & Expansion of Test Centre Software
- Universal Coding System for all Recording/Sensor Devices
ICAR Certifications and Routine Procedures

New Resources on Certification, Routine Procedures & User Manuals are Available on ICAR Website

Continuously updated by RSD-SC with manufacturer support
Revisions to Section 11 in Progress

Accuracy & Performance Standards

New or Modified Device Test Application

Desk Review or Test Plan

Recording & Sampling Devices

Installation and Routine Test Evaluation

ICAR Test

AMS

Sensor Devices

Test Report

Annual Member Organization Reporting

RSD-SC Review

Annual Manufacturer Reporting & Labeling

Device Certification

Quality Assurance & Best Practices

THE GLOBAL STANDARD FOR LIVESTOCK DATA

Section 1 - Guidelines for Testing, Approval and Checking of Recording and Sampling Devices
List of Procedures

- [Procedure 1] Procedure for Application for Testing of Recording and Sampling Devices or Sensor Devices and/or Systems
- [Procedure 2] Procedure for Testing of Traditional Milk Recording and Sampling Devices
- [Procedure 3] Procedure for Testing of Automatic Milk Recording and Sampling Systems
- [Procedure 4] Procedure for Testing of Sensor Devices and/or Systems
- [Procedure 6] Procedure for Evaluation of Installation and Routine Calibration Procedures for Sensor Devices and/or Systems
- [Procedure 7] Procedure for Computerized Solutions for Periodic Checking of Recording and Sampling Devices
- [Procedure 8] Procedure for Computerized Solutions for Periodic Checking of Sensor Devices and/or Systems
- [Procedure 9] Procedure for Test-Day Practices Using Recording or Sensor Devices and Electronic Identification Simultaneously
- [Procedure 10] Procedure for Test-Day Practices for Obtaining Milk Samples on Individual Animals from Sampling Devices
- [Procedure 11] Procedure for Labeling of ICAR-Certified Devices
- [Procedure 12] Procedure for Annual Reporting of ICAR-Certified Devices in the Marketplace by Manufacturers
- [Procedure 13] Procedure for Annual Reporting of ICAR-Certified Device Usage and Satisfaction by Member Organizations
- [Procedure 14] Procedure for ICAR Certification of Devices
ICAR Universal Coding Systems for Devices

Development and delivery by Interbull (tentative) on behalf of ICAR

Will include traditional recording devices and sensor devices/systems

Allow for data source characterization by member organizations, data handlers and data users

In addition to device code, system would include:

- Manufacturer
- Software Name
- Data measured
- Device Name
- Software Version
- ICAR Status
- Other Marketplace Names
- Firmware (if applicable)
- ICAR Status Date
Challenges with the Next Generation of Devices

- We are Looking at Systems Instead of Devices
- New Systems Measure More than a Single Parameter
- System Measures One Variable and Reports Data as a Different Trait
- Reliance on Automatic ID Systems and Association with the Correct Cow
- Speed of Commerce is Faster than ICAR Testing
Reviewing Recording & Sampling Devices or Systems

What does the device measure?

What is the accuracy and precision of the measurement?

How is the device calibrated & maintained?

We cannot determine suitability of data until we know and understand the measurement.
Multiple Ways to Classify On-Farm Data

Do We Know What We Want or Need?

- **Management Data**
  - Yield
  - SCC
  - Milking Speed
  - Feed Efficiency

- **Animal Health Data**
  - Locomotion
  - Reproduction
  - Disease
  - BCS/Weight

- **Animal Welfare Data**
  - Activity
  - Mobility
  - Eating, Resting
  - Heat Stress

- **Data Linked to Direct Farm Payments**
  - Yield
  - Fat, Protein
  - SCC

- **Alarm Data**
  - Heat Detection
  - SCC
  - Locomotion
  - Location

- **Yes/No Data**
  - Pregnancy
  - Disease

- **Trend Data**
  - BCS/Weight
  - Milk Flow/Speed
  - Feed Efficiency
  - Eating, Resting

- **Data for Genetic Evaluations & Official Programs**
Sensor Devices Bring More Challenges

- Software Updates – Is Version Control Important?
- Measured vs. Estimated vs. Displayed vs. Usable Data
- Lack of Standard Data Definitions & Practices
- Validation, Maintenance, and Calibration Protocols are Missing
- Data Connectivity, Storage, Source, and Transfer
- Managing Sensor System Bias and Individual Sensor Bias

Animal ID is More Important Than Ever

- The ‘official ID’ of an animal most likely will not be the same as ID associated with sensor measures
- Animals may have multiple IDs over their lifetime
- Animals may have multiple IDs on their body at once
- Databases will need to have protocols for ID cross-referencing and validation
- Need ICAR & MRO protocols for on-farm validation of the automatic ID system and for data transfer/custody
How are values computed for missing data points?

Estimations?

Mean values without missing data?

Component of the quality of data entering the system
### What is the Difference?

<table>
<thead>
<tr>
<th>Raw Data</th>
<th>Measuring one variable &amp; reporting another</th>
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<tbody>
<tr>
<td>Estimated Data</td>
<td>Handling of missing data points</td>
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<tr>
<td>Displayed Data</td>
<td>Outlier handling and exclusion</td>
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<tr>
<td>Usable Data</td>
<td>Data smoothing</td>
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<td></td>
<td>Range of accurate measurement</td>
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<td></td>
<td>Precision of data recording</td>
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<tr>
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<td>Data transfer, custody, accessibility</td>
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The Future of Milk Recording

What is Needed?

- Total System Approach
- Focus on Data for Management Purposes and then Assess Usability for Official Programs
- ICAR Guidelines & Protocols for Automatic Recording – Animal ID, Data Capture & Data Editing
- Innovative System Testing and Certification by ICAR
- Continuous Monitoring of Systems for Quality Assurance
- Flexibility in Data Transfer, Packaging and Delivery by MROs
- Active Device Manufacturer Engagement