ICAR Subcommittee on Recording Devices

ICAR Roadmap for addressing Carry Over in milk recording

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Carry over and milk recording

- **Carry Over** = fraction or residue of milk from a cow that contaminates the sample being taken from the subsequent cow.

- Variation from **2 % to 20 %** depending on devices and set up (*Løvendhal et al*)

- Sensitive or new applications:
  - Health Diagnosis: SCC, PCR, ELISA
  - MIR spectrum
  - And lots of future applications...

- Currently no criterion for ICAR approval test on new recording devices more sensitive to C-O (AMS)
ICAR SC on Recording Devices: the Carry Over project

• Project objectives
  – What?
    Update the ICAR guidelines to provide standardized method for measuring carry over and define acceptable limits.
  – Why?
    C-O compromises sample integrity/quality and can make the test results of the milk recorded sample invalid (false positives for health test applications / problem for selection on new traits).

• Stakeholders
  Farmers, Dairy Herd Improvement Orgs, Breeding Evaluation Geneticists, Veterinarians, Manufacturers, Diagnostics companies, Dairy Processors, Consumer.
Project team

ICAR Recording Devices SC

- Martin Burke, IRL, ICAR Recording Devices SC (Chair)
- Uffe Lauritsen, DK, President ICAR
- Steven Sievert, USA, DHIA/QSC
- Kees de Koning, Erik Schuiling, NL, Wageningen Research
- Clément Allain, FRA, French Livestock Institute (Idele)

Research/technical experts

- Peter Løvendhal, Martin Bjerring, DK, Aarhus University
- ICAR Milk Analysis SC
Project milestones

1. Define the method for measuring carry-over

2. Define the acceptable limits

3. Recommendations on best practices to reduce Carry-Over
1. Define the method for measuring carry-over

- Each new device (milk meter, autosampler) intended to be used in official milk recording **need an ICAR approval**

- 3 tests centres: NL, GER, FRA

- **Approval test**
  - **Laboratory test**: influence of flow rates, air bleed, vacuum level, tilting, etc. on measurement accuracy and sampling
  
  - **Farm test**: milk measurement accuracy and sample representativeness (fat percentage)

  - **Currently no requirement for carry-over**
1. Define the method for measuring carry-over

- Only basic method for estimating carry-over on the farm tests: **correlation between fat % difference of consecutive cows with bias (fat % of sample – fat % of the ref. milk)**

- Doesn’t work if carry-over in the reference milk
1. Define the method for measuring carry-over

- **Objective**: Standard method to be used in ICAR test centres (NL, FRA and GER) for milk recording devices approvals in addition to current requirements

- **Protocole criteria required**
  - Repeatable/reproducible
  - Cost effective – using inputs affordable and available
  - Scientifically robust in eyes of all stakeholders
  - Non hazardous and environmentally safe
1. Define the method for measuring carry-over

• **How?** Expert advice and proposals from
  – University Research facilities in Denmark (P. Lovendhal and M. Bjerring)
  – Tracer method (fluorescein) / Water method

• **When?**
  – Paper presented in Aarhus 2013 to wide stakeholder community
  – Incorporate into ICAR Section 11 Guidelines Berlin 2014
2. Define acceptable limits by test

- **Objective**: set limits adapted to each application
  - Different applications and different ranges of values
    - Fat (2 to 7%) and Protein content (2 to 4.5%)
    - SCC (ε to 10^6/ml)
    - PCR (0 or 1)
  - Probably don’t need the same limits for fat than for SCC or PCR
2. Define acceptable limits by test

- **How?** Expert advice and proposals from ICAR milk analysis sub committee

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<th>Milk analytical devices</th>
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3. Best practices to reduce C-O on sampling

- Animal Id reliability (visual, automatic)
- Milking systems (milking parlours, AMS)
- Operators on farm (farmer, milk recording agent, mfr technician)
- Recording devices (fixed/portable meters, Auto samplers)
- Lab analysis risks
3. Best practices to reduce C-O on sampling

• Not guidelines but suitable practical guide for MROs and Mfrs
• Possible content

**Best Test Day procedures to reduce C-O**

- Devices installation as specified (levels, height)
- Sampling rules (bottles emptying)
- Equipment cleaning between animals
- AMS: appropriate set up for sampling and trained personnel

**Best well known practices on milking systems and recording devices**

- Minimize surfaces and hidden reservoirs
- Use of slick surfaces
- Best practices on sampling (ex: previous milk surplus draining)
- Compromise no C-O / no FFA (appropriate set up)
Roadmap to Berlin 2014

1. Define the method

2. Define the acceptable limits

3. Recommendations on best practices to reduce Carry-Over and discussion with stakeholders

4. Presentation and sharing in Berlin 2014
Thanks for your attention!