IDF/ICAR Project on Reference System
for Somatic Cell Counting in Milk

NEWSLETTER 6 - JULY, 2015

# Somatic cell counting, it keeps you busy...


When reading this title, your perception will probably be dictated by the way you are involved with somatic cell counting. Routine laboratory workers will think of the millions of herd bulk samples and individual cow samples that pass through their laboratories every month. Reference material providers, proficiency test organizers and the actors in method standardization are doing their best to provide the proper tools for anchoring and to help in safeguarding traceability for all these counts. Method developers are committed to use the best available technologies for differential somatic cell counting and in this way to gain even more precise information on the udder health status of lactating animals. In some parts of the world, governmental and non-governmental stakeholders give attention to the adequacy of stated limits.

All these various aspects of somatic cell counting were tabled in a well-attended meeting during the IDF/ISO Analytical Week in Namur, Belgium, in mid-April. Close to 50 attendees witnessed the overview given by the EU JRC Institute for Reference Materials and Methods on their encouraging progress with the preparation of a certified reference material. Suggestions for improvement of the reference method were made and initiatives to exploit flow cytometry for differential somatic cell counting were highlighted.

The ICAR community was updated during the ICAR Technical Workshop, which was held in Krakow during the second week of June.

In and around these recent meetings the Project Group received valuable feedback on how to shape the further trajectory for the implementation of a reference system for somatic cell counting. We will gratefully make use of that. Creating a common and solid anchoring system is crucial for improving comparability of results and achieving global equivalence in somatic cell counting.

I wish you a good read on how we are progressing with that. Somatic cell counting, it's still buzzing business!

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# Progress towards a primary reference material

In summer 2014, JRC-IRMM informed the IDF/ICAR project group on SCC in milk, ANSES in its function as EU Reference Laboratory for Milk and Milk Products, and DG SANTE (formerly SANCO) that a certified reference material for SCC in milk seems to be technically feasible based on the state of knowledge at that time. JRC-IRMM planned respective activities within the JRC work programme for 2015 - 2016 and started collaborative work already in 2014. That first work comprised of bi- and multi-lateral information exchanges with several project partners such as AIA-LSL, Qlip, QSE, and ANSES as concerns access to suitable raw material, processing issues, measurement needs and capacities, material commutability, etc. End of 2014, S. Orlandini (AIA-LSL at that time) visited JRC-IRMM to demonstrate the processing procedure developed at AIA-LSL for obtaining milks with low count and high count in somatic cells (procedure based on gravity separation, centrifugation, re-suspension of the cell pellet and dilution of cells in skimmed milk to the desired target levels). Two Belgian laboratories were contacted to perform measurements needed in the frame of the feasibility study experiments, one lab for direct microscopy SCC measurements according to ISO 13366-1|IDF 148-1, one lab for flow cytometry SCC measurements according to ISO 13366-2|IDF 148-2. In spring 2015, the practical work at JRC-IRMM focussed on the production of milks with high and low cell count (AIA-LSL procedure) with subsequent freeze-drying, with emphasis on developing a freeze-drying programme with minimal material alteration during this pro-cess (experiments on-going). Moreover, a dedicated commutability study is currently planned. In addition, a considerable effort was made to assess the capabilities of external laboratories applying either the direct microscopy and/or the flow cytometry methods. This represents a necessary step for the external quality assessment of those laboratories in view of a laboratory intercomparison envisaged for characterising the pilot reference material batch once the feasibility study would be successfully completed.

Reinhard Zeleny
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# Reference values for SCC testing for SCC fluoro-opto electronic milk analyzers

*Looknauth Ramsahoi (CA) manages the Dairy Analysis Laboratory of the University of Guelph. He started in the milk testing field in 1992 at the then Central Milk Testing Laboratory, the first centralized milk testing facility in the world, established in 1965, Guelph, Ontario, Canada. Since then the capabilities of the milk testing laboratory has been amalgamated and expanded within the Agri-food and sister laboratories, the Animal Health Laboratories, to include all products and/or materials associated with the agri-food industry from farm to table.*
*The Dairy Analysis Laboratory provides analytical results, including composition, somatic cells, freezing point and total bacteria for payment and regulatory purposes as part of the Ontario Raw Milk Testing Program requirements.*

*In this article he shares his practical experience with the assignment of reference values to SCC standards.*

"Our lab uses DMSCC cow milk standards purchased from a supplier. These standards are preserved with bronopol , shipped and stored refrigerated and are used within the prescribed shelf life of 4-5 weeks. Three levels of SCC in the ranges (approximately) low (100,000 cells/ml), medium (500,000 cells/ml) and high (900,000 cells/ml) comprises a set of standards.

The standards are used as controls during daily runs and results within the 10% range at each level, are acceptable.

We have found that often with using the DMSCC values from the supplier, the linearity of the three levels was off and as a result one level of SCC would fail the 10% criteria. A residual plot would indicate a curve or a "belly" versus a straight line.

The supplier has been collecting instrumental values at the beginning of every new batch of standards from a number of labs, pooling the results and reporting the maximum, minimum and average for each SCC level. Using the pooled instrumental means as "reference" has provided better linearity and accuracy measurements than using the DMSCC values as "reference".

I would say that the DMSCC values are still useful.

As an additional QC protocol, for each batch of SCC standards, each level would be tested in 25 replicates on two automated somatic cell counters. The results are used to calculate instrument repeatability, reproducibility between instruments and accuracy against the DMSCC and the pooled instrumental means. For the most part, the accuracies are within the 10% both DMSCC and instrumental means. However, the accuracy of the instruments is usually better.

Monitoring interlaboratory proficiency trials also serves to provide confidence in the use of this method of "calibration" for the automated somatic cell counters."

# Feedback from the ISO/IDF Analytical Week (April 2015) and the ICAR Technical Workshop (June 2015)

The ISO/IDF Analytical Week in Namur (BE) and ICAR Technical Workshop in Krakow (PL) provided excellent opportunities to update attendees from the wider IDF and ICAR communities with the latest information on the progress with the project and to jointly discuss the required next steps.

The progress with the development of a primary reference material is highlighted in a separate article in this newsletter. When assigning reference values to such a reference material, both reference method results and routine method results are planned to contribute. For a balanced and objectified assignment of reference values, the plan is to work with quality indexes for the performance of contributing laboratories and the proficiency tests in which they participate. The statistical approach around these quality indexes has been worked out and tested by Werner Luginbühl (Chemstat, CH) and Thomas Berger (Agroscope, CH), see Newsletter 5. The concerned scientific paper will be submitted for publication soon.

In the slipstream of work on differential somatic cell counting, new work on the use of flow cytometry for reference purposes was brought to the IDF/ISO forum for consideration. It was decided to further explore the applicability of these techniques before possibly launching a new separate work item on this.

*Operation needs a structure…*
To safeguard a proper future functioning of the reference system, the need for an accompanying organizational structure is obvious. Solid involvement of the various stakeholders will be key for its success. First discussions during the meetings in Namur and Krakow have made clear that the concerned entity should be neutral and non-commercial. Resources are required for important tasks such as the implementation and the operational coordination of the reference system, its further development and the provision of guidance to and communication with stakeholders. A draft proposal on these tasks, the position and the structure of the concerned entity will be detailed in the coming months.

For a more complete overview of the background of the project and the achievements thus far, we refer you to our website. From there also the former newsletters are available for download.

In case you want to get more closely involved with this project, please contact Silvia Orlandini (sil.orlandini@outlook.it) or Harrie van den Bijgaart (bijgaart@qlip.nl)

# Visit the website

The Project Group makes gratefully use of webspace provided by IDF. All information on the project including an up to date list of all presentations and publications can be reached through www.fil-idf.org/RSSCC.

CLICK HERE FOR MORE INFORMATION AND PREVIOUS NEWSLETTERS

## IDF (International Dairy Federation)

The mission of IDF is to represent the dairy sector worldwide by providing the best global source of scientific expertise and knowledge in support of the development and promotion of quality milk and dairy products to deliver consumers with nutrition, health and well-being.

1200 experts appointed by IDF members work on the areas of dairy farming, food standards, analytical methods, nutrition, hygiene and safety, science and technology and economics and marketing. IDF places great emphasis and importance on ensuring that the works it promotes are of the highest scientific integrity and are relevant and applicable to the dairy sector and industry as well as to international organizations, governments and legislators.

www.fil-idf.org

## ICAR (International Committee for Animal Recording)

ICAR is an international non-profit body that promotes the development and improvement of the activities of performance recording and the evaluation of farm livestock.

This is achieved through:

- Establishing rules, standards and specific guidelines for the purpose of identifying animals, the registration of their parentage, recording their performance and their evaluation and publication of the findings;
- Providing incentives for concertation and collaboration in animal performance recording and evaluation within and among international organisations, public authorities and industry.

www.icar.org

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