

The Reference Standard

Issue 92

August 2025

Special points of interest:

- Somatic Cells:
Featured article!
- EC Elections!
- RM Resources —
Updated!

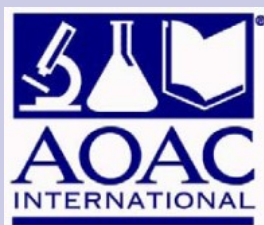
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Did you receive this
newsletter

from a colleague?

Interested in joining
TDRM?

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to learn more.



Executive Committee's Message

The AOAC International community will gather in San Diego, California, USA for AOAC's 139th Annual Meeting & Exposition: A Unique Analytical Science Opportunity at the Town & Country Resort from August 23 to August 28. For first-time visitors, San Diego's top attractions include the San Diego Zoo, Balboa Park, Gaslamp Quarter, and Sunset Cliffs with their stunning ocean views.



TDRM Members circa 1992

In addition to the activities planned at the Annual Meeting, the TDRM Executive Committee election is underway for three Officer positions (Chair-Elect, Secretary, and Treasurer) and three Elected Member positions. The electronic ballot link and candidate biographies are on pages 5-9, with completed ballots due by Thursday, August 21, 2025. Many thanks to the 2025 TDRM EC Nominating Committee for recruiting candidates for this election cycle. As we welcome new leadership, the Executive Committee is grateful for the work and support provided by the departing EC Members during their terms: Derrell Johnson (MilliporeSigma), Katherine Stenerson (MilliporeSigma), Hiroko Suzuki (Japan Food Research Laboratories), and Gretchen Gutierrez (Matrix Sciences).

Meanwhile, on the informational services front, the IS Committee has returned to some work on TDRM services to replace Sharepoint. Sean McClure and Matilde Portnoy have been developing features and completing updates to the Wordpress site as well as updating content and contact information. This will be used for public access to TDRM documents and for promoting interest in TDRM and its activities. Sean will present on some of the changes at the annual meeting in August. Matilde has also been updating content on the archival storage site for TDRM records and organizing the file-sharing site used for committee activities. Additional work on the database has been paused, with meeting to begin again this fall. For any questions or interest, please contact Donna Zink, Information Services Chair, dzink@aimresearchenterprises.com.

In addition to these organizational updates, there is an update to the Reference Materials Resources section on page 11 which includes links to recent topical collection on Reference Materials in the journal Analytical and Bioanalytical Chemistry (ABC).

Furthermore, we are pleased to feature an article on the "Reference System for Somatic Cells in Raw milk - A Success Story to Promote Global Analytical Equivalence" on pages 2-3, that was contributed by the International Dairy Federation (IDF)/International Committee for Animal Recording (ICAR) project's leadership. The article explains the importance of counting somatic cells in raw milk and the need and progress towards a reference system approach.

As the AOAC Annual Meeting approaches, we are looking forward to seeing everyone in San Diego and appreciate all input, and we award our volunteers with gratitude for their contributions in support of TDRM's goals.

Reference System for Somatic Cells in Raw milk - A Success Story to Promote Global Analytical Equivalence

Somatic Cell Counting (SCC) in milk is one of the most performed analysis in the dairy sector, with an estimated 500 million tests conducted annually worldwide. SCC is a key indicator of udder health in lactating animals and plays an important role in food legislation, trade, farm management and breeding programs.

Globally, SCC is carried out using automated instruments in laboratories. In 2010, the joint IDF*/ICAR** project group titled "Reference System for Somatic Cell Counting" (RSSCC) recognized that the dairy sector would greatly benefit from a standardized reference system to ensure global harmonization in SCC results [1]. Since 2024, Pierre Broutin (FR) is the project leader.

* IDF= International Dairy Federation

** ICAR = International Committee for Animal Recording

Why was a Reference System Approach needed?

SCC is predominantly measured using routine fluoro-opto-electronic counters (ISO 13366-2|IDF-148-2) [2] that must be regularly calibrated against the official microscopic reference method (ISO 13366-1 | IDF 148-1) [3]. The RSSCC data revealed that instrument calibrations across the globe often rely on local reference materials, which are typically characterized by only a few laboratories.

Unfortunately, the official reference method is subject to individual analyst interpretation leading to poor reproducibility between laboratories [4]. Additionally, differences in cell types and matrix composition further complicate standardization. These inconsistencies can result in significant biases in international interlaboratory Proficiency Test (PT) [5], highlighting the urgent need for a global harmonized system.

The SCC case illustrates the broader challenge of maintaining consistency in routine methods that depend on poorly defined or subjective parameters.

Development of a Certified Reference Material for Somatic Cell Counters

The program to develop a CRM began in 2014, when the EU JRC-IRMM confirmed technical feasibility based on input from SRMPs. The [ERM-BD001 Milk Powder CRM](#) was officially released in 2020 after multiple production trials [6].

To promote the CRM, IDF and ICAR conducted a webinar in December 2020 available [here](#) and published guidance in the Bulletin of the IDF N° 508/2021 [7]. The latest data were presented at the ICAR Annual Conference & IDF/ISO Analytical Week 2025 in Anand, India ([4. Ppt_Symposium_Pierre Broutin_02.04.25.pdf](#))

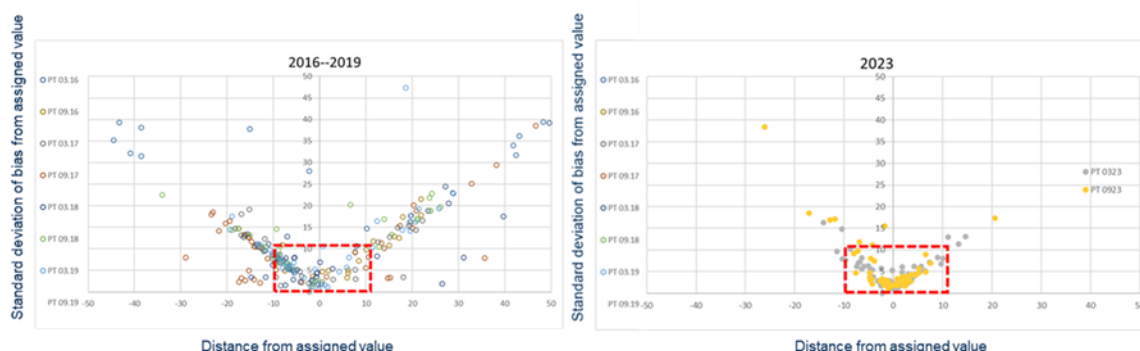
Safeguarding The Reference System for Somatic Cell Counting

The RSSCC group continues to support the global use of ERM-BD001. ICAR organizes two PT rounds each year, involving 42 laboratories from 25 countries across 5 continents. Since ERM-BD001's introduction, variability in PT results has significantly decreased as illustrated on page 3, with most laboratories now reporting values within $\pm 10\%$ of the assigned value.

Continued on page 3

Reference System for Somatic Cells in Raw milk - Continued

RSSCC also currently oversees also the traceability of SRM to ERM-BD001 and supports new advancements to improve the reference and routine methods through initiatives such as the MIAMI and Antoinette projects.



A brief overview of these initiatives can be found in **IDF Newsletter No. 8**: https://fil-idf.org/wp-content/uploads/2021/06/Newsletter-8_.pdf

Follow the story and the advancement of IDF/ICAR RSSCC here: <https://fil-idf.org/our-work/methods-of-analysis-and-sampling/reference-system-for-somatic-cell-counting/>

Bibliography

1. Baumgartner, C. Architecture of reference systems, status quo of somatic cell counting and concept for the implementation of a reference system for somatic cell counting. . Bull. Int. Dairy Fed. 427: 15-21 (2008) [Bulletin of the IDF N° 427/2008: Towards A Reference System For Somatic Cell Counting In Milk](#)
2. ISO 13366-2 | IDF 148-2: 2006 - Milk - Enumeration of somatic cells - Part 2: Guidance on the operation of fluoro-opto-electronic counters
3. ISO 13366-1 | IDF 148-1: 2008 / COR 1: 2009 - Milk - Enumeration of somatic cells - Part 1: Microscopic method (Reference method) / Technical Corrigendum 1
4. Orlandini, S., Lattanzi, L., Toscano, A.M. & Paggi, U. Interlaboratory collaborative study on the reference method for somatic cell counting in cows milk ISO 13366-1|IDF 148-1. Bull. Int. Dairy Fed. 427: 2-14 (2008). [Bulletin of the IDF N° 427/2008: Towards A Reference System For Somatic Cell Counting In Milk](#)
5. Ubben, E.H. & Knappstein, K. 10 years of inter-comparisons on counting of somatic cells in raw milk. Mastitis Newsl. 26: 26-28 (2005)
6. CERTIFICATION REPORT The certification of the concentration of somatic cells (somatic cell count, SCC) in cow's milk: ERM®-BD001 ERM-BD001_report.pdf
7. Bulletin of the IDF N° 508/2021: Guidance on application of EC JRC Certified Reference Material for somatic cell counting in milk. https://shop.fil-idf.org/products/bulletin-of-the-idf-n-508-2021-guidance-on-application-of-ec-jrc-certified-reference-material-for-somatic-cell-counting-in-milk?_pos=1&_sid=b4f94aaod&_ss=r

Contributed by: ICAR/IDF project leadership team

Inés Cereijo Student Award

TDRM sponsors a Student Award raising awareness of the need for method performance evaluation at an early point in a chemist's career. Because not all colleagues have research facilities or may only be involved in a short-term summer internship, nominees are evaluated based on a report describing either the use of a reference material for method performance evaluation or the development of a new reference material.

- Undergraduate and graduate students are eligible; award based on a report that evaluates the use of a reference material for a specific application; winner will receive in USD a \$1,000 prize; \$1,000 towards lodging; \$500 towards transportation; \$400 food, and a TDRM membership.
- Please visit the [AOAC Awards Program for TDRM](#).



TDRM Achievement Award

- Award recognizes an outstanding contribution to the use of reference materials in a unique or unusual manner or to the development of reference materials for laboratory use; nominations are based on a short statement describing the unique or significant contribution of the scientist or group of scientists using 150 words or less.
- Statements and up to 2 letters of support should be sent to sdbhandari1@gmail.com by **May 1, 2026**.



Balloting for 2025 TDRM Executive Committee Election

For 2025, ballots were distributed to all members via email on **Thursday, July 24**. Ballots can be accessed at <https://form.jotform.com/251965140368158> and voting will remain open until **Thursday, August 21 at 23:59 (11:59pm) EST**.

This year's ballot also includes updates to the TDRM Executive Committee bylaws aimed to align more closely with current AOAC and TDRM workstreams. Key changes include improved clarity and consistency of terms, better coordination of timelines, provisions for extenuating circumstances, and clearer definitions of procedures and officer responsibilities.

If you elect to opt out of participating in electronic balloting, please send a request for a paper ballot to sdbhandari1@gmail.com as soon as possible. PDF ballots will be sent via email. The PDF ballot can be returned to AOAC via email or hard copy, but must be received by **Thursday, August 21** to be counted. Please contact TDRM at sdbhandari1@gmail.com with any questions.

Contributed by Sarah Aijaz, Ph.D.,
Nominating Committee Chair &
Sean McClure, Elected Member

"Voting will remain open until Thursday, August 21 at 23:59 (11:59pm) EST."

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Candidate for Chair Elect: Susan Audino, Ph.D.; Consultant



Dr. Susan Audino is an analytical chemist/chemometrician independent consultant to chemical and biological laboratories. Her graduate research areas included experimental chemical kinetics and thermodynamics as well as MALDI TOF/MS application for polymer characterization. As a contractor for multiple accreditation bodies, she has been assessing contract and government laboratories for more than 14 years and has been teaching ISO/IEC 17025 and other technical subject matter for more than 10 years. She is currently on the Board of Directors of the Center for Research on Environmental Medicine, Hood College Board of Trustees, and Faculty and Advisor at Seed to Health/Teachable Medicine. Susan's commitment to professional service includes chairing multiple technical working groups, advising the AOAC Cannabis Analytical Science Program, and participating on various other advisory panels such as Emerald Scientific, Analytical Cannabis, expert review panels, and was among the founding members of the ASTM D37 committee. She has been an invited speaker and participant at many domestic and international scientific conferences, was a contributing author of Cannabis Laboratory Fundamentals published by Springer-Nature in 2021, Purity IQ Standard, NCIA Guide for Laboratory Testing and has published multiple journal articles, webinars and podcasts. Susan has striven to make significant contributions to the field of analytical chemistry in the cannabis industry to ensure science is transparent and valid. She is currently principal of multiple businesses, has been awarded patents and has additional patents pending.

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Candidate Profile for Secretary: Sean Giza; Eurofins Food Testing

Sean Giza is a Quality Control Specialist with Eurofins Food Chemistry Testing in Des Moines, IA. He graduated Magna Cum Laude with a dual degree in Biology and Biochemistry from Grand View University (IA) in 2015 and was also inducted into that Alpha Lambda National Honor Society for his excellence in education as a non-traditional student. In 2015 Sean was recognized as providing Grand View's most outstanding research for his contributions to the beta-glucosidase enzyme kinetics protocol development used in a collaborative grant project with UC Davis and he also was an NSF REU in the College of Chemical Engineering at Iowa State University. In 2017 Sean began his Eurofins career as a client service representative working with clients in the Feed & Grain sector before transitioning to the Quality Team in Fall 2021. As a Quality Control Specialist, Sean works with all internal departments and uses SQC to oversee, develop and troubleshoot QC plans that monitor over 400+ parameters on over 175 methods conducted within the laboratory, with over 60 of those methods maintaining ISO17025 accreditation. In addition to his primary role, Sean also serves as the on-site subject matter expert in USDA APHIS Import/Export Regulations, in-house weights and measures calibrations, and continuously works to ensure laboratory compliance to ISO17025 and AOAC regulations.



Candidate Profile for Treasurer: Sarah Aijaz, Ph.D.; MilliporeSigma



Sarah M. Aijaz, Ph.D., is the R&D manager for Cerilliant™ reference materials at MilliporeSigma in Round Rock, Texas. Her primary focus is the design and development of certified reference materials (CRM) for use in pharmaceutical, clinical, and forensic quantitative applications. She has presented CRM development work at multiple conferences with a focus on certification methodology. Aijaz received a B.S. in Chemistry from Texas A&M University, College Station, and a Ph.D. in Analytical Chemistry from the University of Texas at Austin. She joined Cerilliant in 2012 in the Quality Control group and moved to Research & Development in 2015.

Candidate Profile for Elected Member (1 Year Term): Patrick Low; Eurofins Food Testing

Mr Patrick Low graduated from the National University of Singapore in 2000 with a BSc (Hons) majoring in chemistry. He is currently serving both as the Business Unit Manager and Technical Director of Eurofins Food Testing Singapore leading a team of sixty staff. The laboratory is involved in food nutritional and contaminant testing. He had worked in various laboratories in the past twenty-five years that specialized in areas ranging from environment testing to food, agricultural and specialty product testing.

Patrick regularly provides technical consultation services to both the food industry and to the local government regulatory bodies. He was appointed by the Singapore Accreditation Council (SAC) as a technical assessor for accreditation of laboratories under ISO 17025 since 2015. He was also appointed in August 2024 as part of the National Mirror Committee (NMC) for ISO TC 34 SC 6 Meat, Poultry, Fish, Eggs and their Products.



Candidate Profile for Elected Member (3 Year Term): Sean McClure; Abbott Laboratories'



Sean McClure is a Quality Manager at Abbott Laboratories' for the Laboratory Operations group within the Global Food Safety team in Columbus, Ohio, USA. His current responsibilities include laboratory control charting and control material qualifications, laboratory investigations, TPL/supplier/vendor management, audit support, and other global laboratory operations support. Previous technical responsibilities include developing, validating, transferring and improving analytical test methods for nutrients in infant and adult nutritional products

Sean is an author and the study director for AOAC 2015.14/ISO 21470/ CODEX II method for b vitamins in infant formula and adult nutritional products, participated in the AOAC Proficiency Task Force, and is a current elected member of the TDRM Executive Committee where he works on various subcommittees and currently leads the Bylaws Subcommittee.

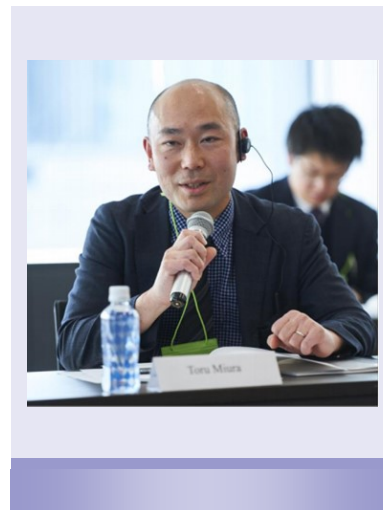
Sean earned a BA degree in chemistry from Miami University with a focus in mathematics and has completed work towards a data science master's degree at the University of Wisconsin.

Candidate Profile for Elected Member (3 Year Term): Toru Miura; FUJIFILM Wako Pure Chemical Corporation

Toru Miura is a laboratory manager and the head of the Reference Material Group within FUJIFILM Wako Pure Chemical Corporation. He has been with FUJIFILM Wako since 2011. Prior to joining FUJIFILM Wako, he worked as a research chemist in the National Metrology Institute of Japan (NMIJ), focusing on development of Certified Reference Materials using quantitative NMR (qNMR).

Currently, he is a working group member of the Japanese Pharmacopeia herbal medicine and chemical pharmaceutical related to qNMR, a committee member of the Japanese Industrial Standard (JIS) K 0138 and Japanese Agricultural Standard (JAS) related to qNMR, and an invited expert of ISO/TC34 (Food products) and ISO/TC334 (Reference Materials). Since 2020, he has served as a member of the United States Pharmacopeia Expert Panel for qNMR to revise USP NMR General Chapters <761> and <1761>.

Toru has a Master of Science, Bioresource Sciences from Nihon University in Kanagawa and a Bachelor of Law from the School of Law at Meiji University in Tokyo.

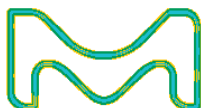


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FREE ONLINE TRAINING COURSE



Estimation of uncertainties and the use of reference materials

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The European Commission's Joint Research Centre launches a free interactive course on reference materials.

The Joint Research Centre is one of the leading global producers of reference materials in the fields of food and feed analysis, environmental analysis, engineering and health applications.

Quality of measurements is key in our daily life. Reference materials ensure useful, reliable and comparable results from different methods and laboratories.

Our new online training sessions will teach you how to use reference materials and how to estimate measurement uncertainties.

In this course, you will learn the basics why measurement uncertainties are important and how you can estimate them.

You will learn the role and importance of reference materials and how you can best select and use them.

Our interactive course will be complemented by practical exercises where you can apply and test your newly acquired knowledge.

You will be able to follow 8 modules:

Estimation of measurement uncertainty

This module explains what measurements uncertainty is and why is needed. You will learn how to estimate measurements uncertainty and will be get more details on the quantification procedure and whether it is a combination of uncertainty sources. At the end we show two options: the so-called bottom-up approach and the so-called top-down approach (use of validation data).

Use of CRMs to prove laboratory and method performance – This module provides the tools to understand how to make use of the added value of certified reference materials (CRMs) to prove laboratory and/or method performance.

Making the best use of RMs – This module presents how to get the best use out of reference materials and you will learn what sources of

information are available.

Use of CRMs in method validation – In this module, will be explained how to validate a new method and how to estimate the measurement uncertainty of its results.

Commutability of reference materials – After being acquainted with the validation of a new method and how to estimate the uncertainty of its measurements, in this module focus will be on the commutability of reference materials.

Selection of reference materials – In this module will be presented all the steps to consider when selecting a reference material.

Traceability of measurement results – In this module, will be explained the metrological traceability and its role for the comparability of measurement results. Furthermore will be described how certified reference materials or CRMs can be used to help you to make your results traceable.

The wrap-up – This last module provides an example of how this course can guide you through the processes in your laboratory practice.

This course is intended for practitioners working in laboratories that need to apply reference materials for statistical quality control, method validation and calibration and who need to assess measurement uncertainties on customer's demand or as requirement of the ISO/IEC 17025 standard. It can also be useful for ISO/IEC 17025 auditors who need to assess the estimation of measurement uncertainties and the correct application of certified reference materials.

Join EC-JRS's online course and boost your knowledge in reference materials and measurements!

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Register [here](#).

Enjoy the journey in the exciting world of measurement science!

Join the free interactive course on reference materials and measurement uncertainty!

Member Corner

Congratulations on your TDRM membership! Whether you are a new member or a returning member, we are happy to welcome you. As a member, you may be wondering how you can become more involved in the group. There are a number of ways to become involved with varying time commitments, please feel free to email any member of the board to discuss the opportunities (contact information on pages 12–13). A few examples include:

Attend our member meeting at the AOAC INTERNATIONAL Annual Meeting in San Diego, California, USA., in August 2025. We will discuss our work from 2025 and our directions for 2026. This is a great opportunity to meet the TDRM leadership and make suggestions.

Donna Zink is looking for volunteers to help with the reference material database (<http://tdrmdb.aoac.org/>).

Propose a session for a national meeting or a local section meeting.

Run for office. Please contact Sarah Aijaz, Nominating Committee Chair, at sarah.ajaz@milliporesigma.com, if you would like to be considered for a future election, or to suggest a nominee.

To learn more about TDRM and their [mission](#), please send an email to volunteer your ideas and skills or just to ask how you can be more involved.



Join TDRM on LinkedIn!
[Request Membership Here](#)

Reference Material Resources

Do you ever find yourself looking for basic information about reference materials? Look no further!

Ever wonder [how to compare a measurement result with a certified value](#) to determine if your method is appropriate? [What about how to use a reference material for calibration \(including examples\)?](#) Ever tried to figure out [how to use a reference material to establish traceability](#)? Wait, there's [more!](#) There is a discussion of using reference materials to quantify GMOs in [food and feed](#), and in [DNA copy number ratio](#). European Reference Materials (ERM) even provides a guide on [use of their certificates and materials](#), and the National Institute of Standards and Technology (NIST) has an excellent [Frequently Asked Questions](#) section where you can find a plethora of additional information. NIST also released [The ABCs of Using Standard Reference Materials in the Analysis of Foods and Dietary Supplements: A Practical Guide](#) in June 2014.

Additional RM Resources! The *Cooperation in publicly funded reference material production*, is a free, open access article available to download at <https://link.springer.com>. TDRM guidelines: Applications and Resources for Use of Reference Materials: [TDRM Guidelines](#).

Reference Materials in Analytical Chemistry

A recent topical collection on Reference Materials in Analytical Chemistry was published in May 2025 in the journal *Analytical and Bioanalytical Chemistry* (ABC), guest-edited by Kate Rimmer at National Institute of Standards and Technology (NIST), Gaithersburg, USA, and Håkan Emteborg at European Commission, Joint Research Centre, Geel, Belgium JRC. This comprehensive collection offers valuable insights for anyone interested in reference materials, with the editorial written by Emteborg providing an excellent summary of the contributing articles. The collection features numerous open access articles with graphical abstracts, making a wealth of information readily accessible to readers.

The [complete collection](#) and the [specific issue](#) provide comprehensive overviews of current developments in reference materials research and applications.

2024-2025 Executive Committee



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Ancillary Appointed Positions**Information Services Chair**

Donna Zink, AIM Research Enterprises

ISO-REMCO Liaison

Pearse McCarron, NRC Canada

Advisor

Wayne Wolf, USDA (retired)

Newsletter Editor

Charles Barber, FDA

Membership Chair

Vacant

AOAC Support Positions

Deborah McKenzie

Email**sdbhandari@gmail.com*****if you are interested in becoming more
involved in the TDRM through the
Executive Committee.***



AOAC INTERNATIONAL expanded its mission statement "To promote quality measurements and method validation in the analytical sciences." Focus has increased on accuracy of analytical measurements generated by AOAC methods and the role of reference materials in verification of accuracy.



The Technical Division on Reference Materials (TDRM) further develops and maintains AOAC INTERNATIONAL's status as a recognized worldwide authority on methods validation and quality analytical measurements through facilitating the use of reference materials in collaborative validation, implementation, and routine use of AOAC methods.

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*Improving the Quality of Laboratory Measurements
through the use of Reference Materials*