ICUMSA

International Commission
for Uniform Methods
of Sugar Analysis

Historical and Contemporary Aspects of ICUMSA

A British National Committee Perspective

Nick Bourne & Karen Pardoe

Your presenters

* Dr Nick Bourne
  * Former president, secretary and member of BNC
  * 20+ years in the sugar industry, working for Tate and Lyle
    * Retired but providing consultancy services
  * ICUMSA Associate Referee for GS3, Specialty Sugars
* Karen Pardoe
  * Current president, former secretary and member of BNC
  * 20+ years in the sugar industry, working for British Sugar
  * ICUMSA Referee for GS2, White sugar
    * Associate Referee for S5 (Chemical Methods) and S7 (Indirect methods and new technologies

What is ICUMSA?

International **C**ommission for **U**niform **M**ethods of **S**ugar **A**nalysis

* The only organisation solely concerned with the production of methods of analysis to aid sugar manufacture and the trade in sugar
* International organisation with members from over 20 countries from all around the world (both beet and cane sugar)
* Conference (Session) every two years
* 100+ methods in the ICUMSA Methods Book
* Methods adopted in specifications by EU, Codex Alimentarius, European Pharmacopoeia, US Food Chemicals Codex, OIML, ISBT, SAL/RSA

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Trading Sugar – The Pol Problem

"The exact determination of the value of goods is essential to the promotion of their international exchange."

Sugar sold by appearance (colour)

* 1839: Use of reference sugars (later, colour tables)
* 1847: Eilhard Mitscherlich developed the first usable polarimeter
* 1871: "It is now scarcely any longer possible to buy sugar without polarisation."
* 1897: Herzfeld founds ICUMSA (for authentication of quartz plates)

ICUMSA

The Birth of ICUMSA

"took place without special formalities, without statute, and official registration."

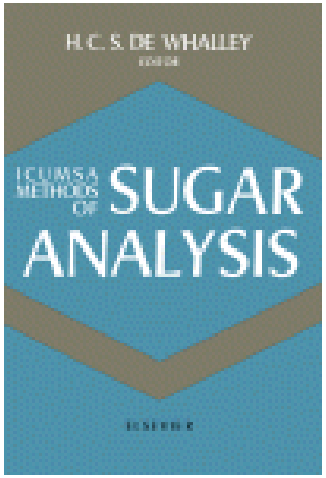
* Assumed to be short lived, however Pol is the never ending story.
* First meeting in Hamburg 1897.
* 9 Germans + 1 Austrian at the meeting. The "International" in ICUMSA came from
* pledges of support from America, Belgium, France, Holland, and Italy.

“Fog in Channel. Continent Isolated”

UK late to the party, finally joins ICUMSA in 1903 (6 years after founding)

* 1909: Meeting in London. One reporter optimistic that “as it had raised hopes that the English chemists, who until now had not taken a great part in international decisions, would cooperate in larger numbers and vote for the important resolutions.”
* 1932: Formation of National Committees.
* 1936: Meeting in London. Held at Institute of Chemistry. 80 members from 20 countries.

The de Whalley Presidency 1954 - 1962



- Promoted use of ICUMSA as a handy acronym
- 5 Methods for invert determination adopted
- Concept of total water
- MA/CV for particle size

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The Carruthers Presidency 1970 - 1978

"Somebody talked of tea!"

Albert "Ace" Carruthers created and led the Research Dept for British Sugar Corporation

- First "Official" method for polarisation of raw sugar
- Drive for ICUMSA to adopt more contemporary analytical methods
- New format for publishing the Proceedings of the international meetings
- Work with Codex Committee and European Community on methods for sugar analysis

The Parkin Presidency 2007 - Present

Geoff Parkin has worked for British Sugar and Sudzucker

- Strategic planning committee
- Growth of proficiency testing scheme
- 2012 Cambridge meeting
- Changes to subject groupings
- 2014 ICUMSA registered as “Company Limited by Guarantee”, just 110 years after establishment

ICUMSA International Commission for Uniform Methods of Sugar Analysis

ICUMSA Methods - Basics

General **S**ubject, **SP**ecifications & **S**tandards

* 9 GS – organised on product lines
  * Raw Sugar to Plantation White Sugar
* 5 SPS – applicable over the whole range of sugar industry analysis
* Method numbering unique to each method
  * Sequencing under product heading from Pol to microbiological methods
  * Unique to each method; first number is product of primary importance
  * E.g. GS2/1/3/9-15

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ICUMSA Methods - Development

* Methods developed by Referees and Associate Referees
* Validation by international collaborative study
  * Follow IUPAC protocol
* Study results determine whether Referee recommends method adoption
  * Through reporting of work at ICUMSA Plenary Session
* Three classes of method status
  * Official
    * Official (Reference) – defined in 2010
  * Accepted
  * Tentative

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ICUMSA Method - Standardisation

* Different methods may give different results for the same sample
  * Codex type 1 methods
* It is important to understand how well each method performs (accuracy and precision)
  * Codex criteria approach
* The most appropriate methods can then be selected and adopted within sugar specifications
* Where more than one Official Method exists for the same sample type and scope, there is a sub-category of Official (Reference)
  * Recommended to use methods with this status in case of any disputes

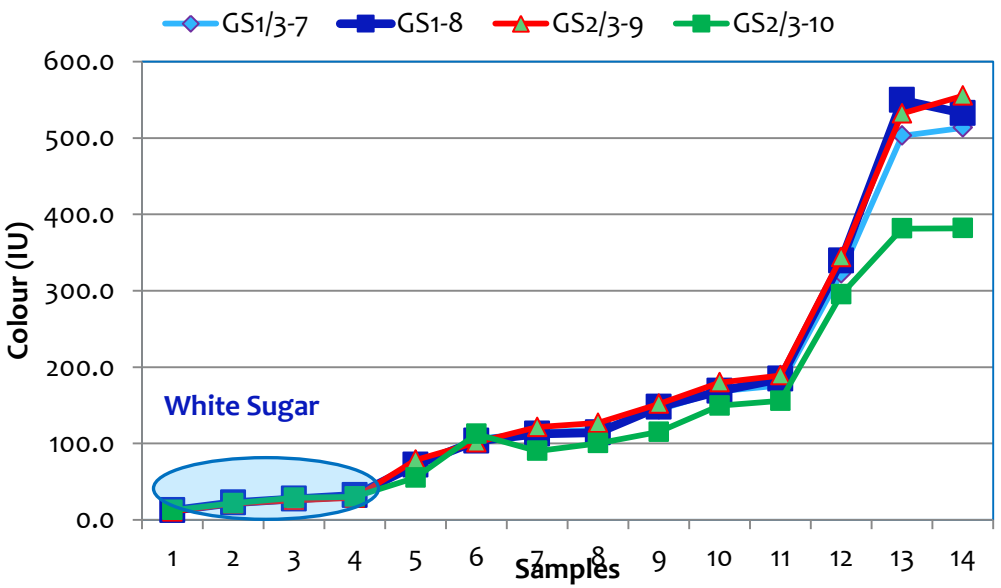
ICUMSA Method - Colour

To many people, ICUMSA = Sugar Colour

* 4 ICUMSA methods for Sugar Colour
  * GS1/3-7, GS2/3-9, GS2/3-10, GS9/1/2/3-8
* Various collaborative tests
  * Sample types from white to raw cane sugar
  * Samples and participants from across the globe
  * Concern about effect pH has on the measurement

ICUMSA Method - Colour

* 2002 collaborative test showed clear relationship between pH and colour
* Conclusion of work reported at 2012 session
  * Solution colour measured at 'natural' pH of sugar provides no better precision than for that determined at pH 7.0



Proficiency Testing Scheme

SUgar analytes **P**roficiency **S**cheme

* Managed and operated by LGC (Standards PT)
* Technical advice provided by SUPS Advisory Group
  * Includes ICUMSA representatives
* Scheme operated Jan-Dec each year
  * White sugar - 15 chemical/physical analytes and 8 microbiological tests
  * Raw sugar – 7 chemical/physical analytes
  * Molasses – 5 chemical/physical analytes

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ICUMSA Methods - Change

* Work on re-numbering of the methods
  * The ICUMSA system of numbering is confusing to
* Work on complete standardisation of nomenclature and format of methods
  * Terminology will be harmonised and set for future methods
* Alternative formats for the Methods Book
  * Option for on-line access
* Further harmonisation with global standards
  * Link to Codex/ISO standards

ICUMSA Future

Invest in the future!

* ICUMSA work underlies much that is done in the international sugar trade and related areas
* ICUMSA work done by members is done on a voluntary basis
  * Need support for this work from employers
* Continued support by sugar companies, traders, etc. is an absolute requirement for the future of ICUMSA
  * Even in challenging commercial times