

Update on ISO methods and a lookback on 50 years of food microbiology

Melody Greenwood
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ISO/TC 34/SC9

Microbiology of the Food Chain

- ▶ Committee very active currently
- ▶ Now 35 working groups (WGs), 7 *ad hoc* working groups, 1 subgroup WG2/WG3
- ▶ Considerable focus on validation and organising inter-laboratory studies (ILS)
- ▶ Need to consider food and feed supplements and additives, ingredients such as beeswax and fish oil, insects.....
- ▶ Further development on SC9 website
- ▶ <https://committee.iso.org/home/tc34sc9>

ISO 16140 (validation)

Part 1 Terminology	Revision to start late 2023
Part 2 Validation of alternative (proprietary) methods against a reference method	Amendment 1 draft by March 2023 will include improvements to Annex A and larger portion sizes. Once complete, revision of whole part.
Part 3 Verification of reference and alternative methods in the laboratory	“Frequently Asked Questions” in relation to implementation of part 3 in draft now.
Part 4 In-house (single laboratory method validation	Amendment 1 in preparation to deal with a new Annex H – validation of larger test portion size for qualitative methods; DIS in 2023
Part 5 Factorial inter-laboratory method validation	-
Part 6 Validation of microbiological confirmation methods	-
Part 7 Protocol for the validation of identification methods of microorganisms	Draft document being prepared for DIS vote in 2023
ISO 17468 technical requirements for the establishment/revision of standardised methods	Draft for ISO/DIS completed with vote to be launched shortly

ISO 11133

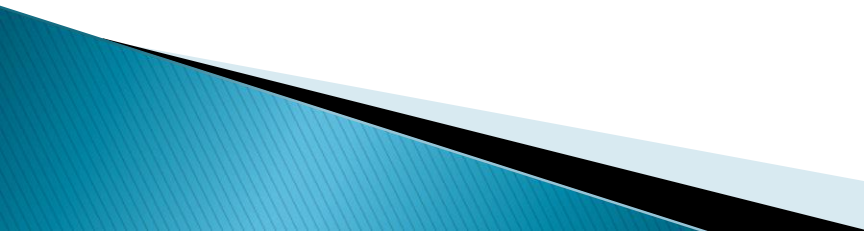
JWG5: Culture media

- ▶ The NP draft of the revised standard is now ready to be circulated for comment. This includes performance testing of contact plate media.
- ▶ Strains in Annexes E and F that have now been included in individual ISO methods have been removed. However a full list of strains for performance testing is available on the ISO 11133 webpage of the SC9 committee and is updated yearly.
- ▶ Refer to <https://committee.iso.org/home/tc34sc9>

Choice of *Listeria* strain in ISO 11290

- ▶ JWG5 is currently undertaking a comparison study to replace *Listeria monocytogenes* WDCM 00109 which gives variable results for haemolysis. The strain chosen for comparison is DSM 112143. This strain has been lodged in NCTC and the Japanese culture collection and will be available from NCTC in early 2023.
- ▶ If the study shows that DSM 112143 is more suitable, amendments to ISO 11290 parts 1 and 2 will be prepared and the information submitted to the World Data Centre for Microorganisms (WDCM).

ISO 7218 revision

- ▶ Recently completed DIS vote and currently considering comments.
 - ▶ FDIS stage end 2022 /early 2023 (editorial comments only), publication late spring 2023
 - ▶ Now includes revised text on spiral plating with a proposed validation /verification protocol
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Detection & enumeration of *Escherichia coli*

- ▶ WG18 now encompasses ISO 11866 and ISO 7251 as well as ISO 16649.
- ▶ Revision of Part 1 of ISO 16649 already published. An inter laboratory study protocol has been prepared to compare the use of spread and pour plating techniques for part 2. The DIS will be launched after the ILS.
- ▶ Validation of part 1 is also needed.
- ▶ Part 1 of ISO 11866 will be harmonised with ISO 16649-3
- ▶ The CD ballot of ISO 7251:2005/DAMD 1 to include performance testing will be launched shortly.

ISO 6887-1 Amendment 1

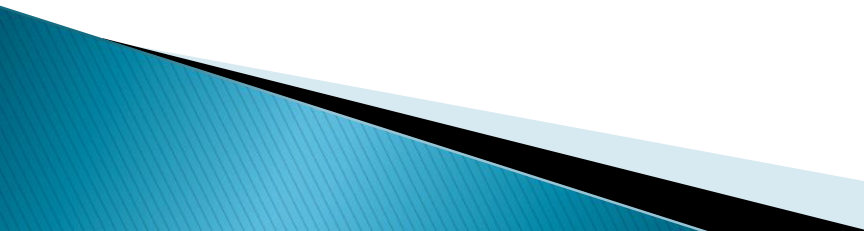
- ▶ This WG is currently working on validation of the use of larger portion sizes in qualitative methods. This will help to limit the burden of validation on individual laboratories. The CD vote is expected early 2023.

- ▶ ISO 6888

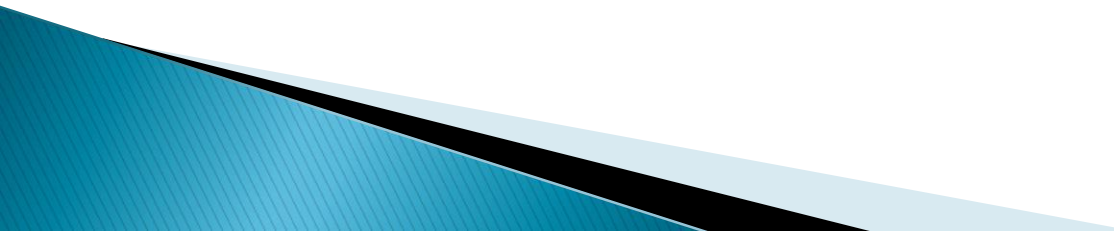
- ▶ The revised parts 1 & 2 for *S.aureus* were published end 2021, however many mistakes were made at the final editorial stage. The corrected version will go to DIS vote by end 2022

ISO 21527 revision

Enumeration of yeasts and moulds

- ▶ Revision combines both parts into one ISO
 - ▶ Method A – routine test using DRBC
 - ▶ Method B – routine test using OGYE or CGYE
 - ▶ Method C – moderate xerophiles using DG18
 - ▶ Method D – extreme xerophiles using MY50G
 - ▶ CD vote to be launched early 2023
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Enumeration of Enterococci

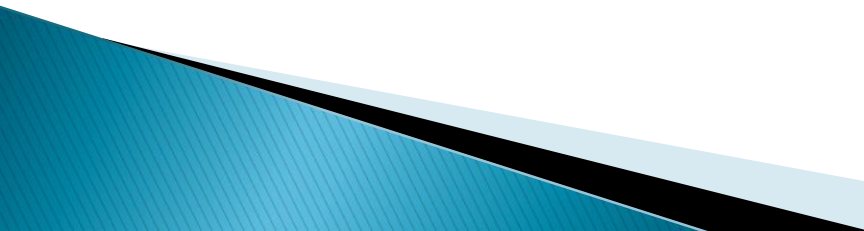
- ▶ WG21 has selected modified Slanetz and Bartley agar as the preferred selective medium.
 - ▶ A draft based on NMKL 68: 2011 will be prepared with some modifications.
 - ▶ The NWIP vote based on this draft will be launched by July 2023.
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Sulphite reducing clostridia & *Clostridium perfringens* ISO 15213 series

- ▶ Part 1 – SRAs by colony count based on original ISO 15213; FDIS launched shortly.
- ▶ Part 2 – enumeration of *C.perfringens* based on ISO 7937; additional ILS has been performed, DIS out this autumn
- ▶ Part 3 – Detection of *C.perfringens*; will remain as a technical specification (TS) as insufficient data sets from ILS for a full standard. Written consultation in early 2023

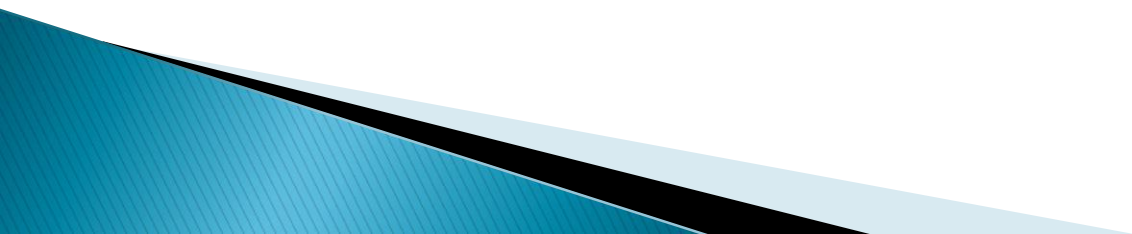
ISO 4833

Colony Counts at 30°C

- ▶ Amendments to both parts to clarify scope published January 2022.
 - ▶ Final report of the statistical evaluation of pour and spread plate results including spiral plating results now under review. A final data set of 760 samples from 7 countries and at least 9 different organisations was evaluated statistically.
 - ▶ Overall outcome – significant difference in t-test at 95% level only between pour and spread with slightly higher spread results; spread results also slightly higher than spiral results.
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Miscellaneous

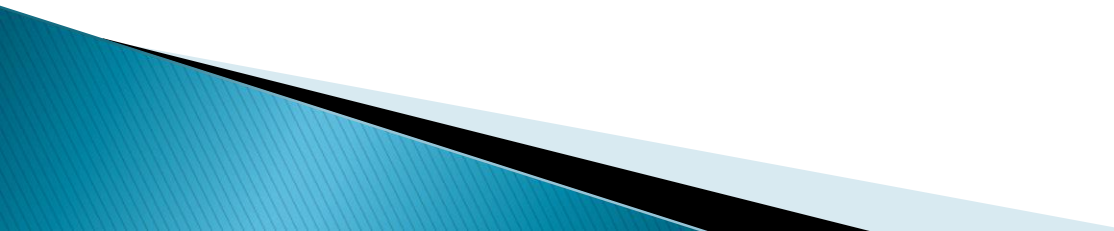
- ▶ WG29 working on final version of the risk profiling of spores. Will include spore definition and corresponding methodology
- ▶ ISO 23418:2022 – whole genome sequencing for typing and genomic characterization of bacteria – general requirements and guidance has been published
- ▶ ISO 11290– Recent enquiry on options to improve ½ Fraser pre-enrichment step (proprietary and non-proprietary)



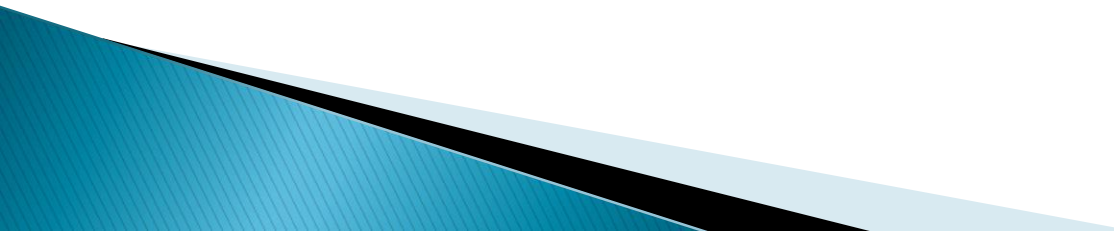
FOOD MICROBIOLOGY

A review of 50 years

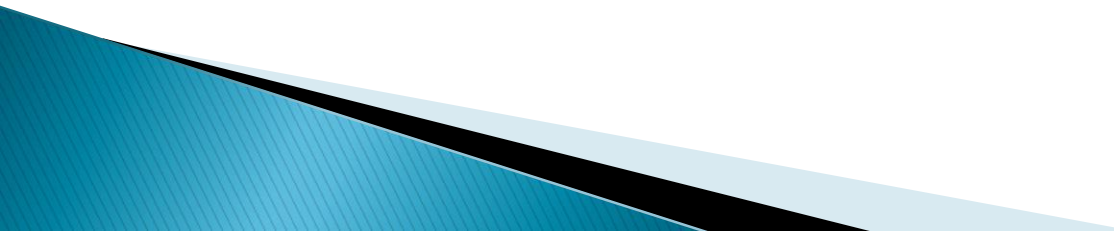
1970s

- ▶ Glass equipment everywhere
 - ▶ Food culture media
 - ▶ Testing methods
 - ▶ Equipment
 - ▶ Technical
 - ▶ Pathogen isolation
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1980s

- ▶ Progress
 - ▶ *Listeria* in food
 - ▶ *Salmonella* in eggs
 - ▶ *Escherichia coli* O157
 - ▶ Equipment for food microbiology testing
 - ▶ Method standardisation
 - ▶ Quality control
 - ▶ Proficiency testing
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1990s

- ▶ Quality management systems
 - ▶ Method standardisation
 - ▶ Accreditation
 - ▶ Detection of alkaline phosphatase
 - ▶ WWW
 - ▶ PCR + IMS
 - ▶ Chromogens
 - ▶ Centralisation
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2000 onwards

- ▶ Uncertainty of Measurement
 - ▶ Increased automation including systems to automate enumeration methods
 - ▶ Commission Regulation (EC) No. 2073/2005
 - ▶ Novel foods, probiotics and food supplements, insects.....
 - ▶ Increased numbers of internationally standardized test methods
 - ▶ Whole genome sequencing
 - ▶ Mass spectrometry
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2022

Key aspects

Quality control

Accreditation to ISO 17025

More machines (fewer skilled people)

Faster detection and enumeration methods

Replacement of traditional methods

Zoom/Teams meetings

Validation, validation, validation!