Food and Agriculture Organization of the United Nations

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Centre for Environment, Fisheries & Aquaculture Science

Guidance note

Troubleshooting guide for problematic results in *E. coli* and *Salmonella* Proficiency testing schemes

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Version control history

Version	Author	Date	Comment
1	L. Stockley	01.05.20	1st issue
2	L. Stockley	24.10.25	Updated to MPN table intrepretation

1. **Methods**

   Check that the method used is appropriate for the examination of the sample.

   a. Check that that any dilutions have been calculated correctly.

   b. Check that the dilutions analysed are as specified on the report form.

   c. Check the MPN tables (if used) are interpreted correctly.

2. **Interpretation of MPN tables**

   Record the number of TBX positives for each dilution to give a three or four figure tube combination number. Use the MPN calculator for 100 g test portions referenced in ISO 7218 (Anon, 2024) (ISO Standards Maintenance Portal), one of the MPN calculators available from the Cefas FAO Reference Centre website (Method Guidance and Calculation Spreadsheets - Cefas (Centre for Environment, Fisheries and Aquaculture Science)) or the MPN tables in the FAO Reference Centre *E. coli* generic protocol (Generic Protocols - Cefas (Centre for Environment, Fisheries and Aquaculture Science)) to calculate results expressed as MPN per 100 g.

   Note: In all cases the MPN must be calculated using the number of positive tubes counted at **ALL** tested dilutions, even if lower dilutions are completely negative. For example, if a four-dilution combination of 5,3,0,0 is obtained the result should be reported as 780 (MPN result for a combination of 5,3,0,0) rather than 790 (MPN result for a combination of 5,3,0).

   Note: Only category 1 or 2 tube combinations should be reported – category 3 combinations should be recorded / reported as 'Void'. The MPN tables in the FAO Reference Centre generic *E. coli* protocol only include category 1 or 2 tube combinations: any tube combination that does not appear in these MPN tables are an unacceptable (category 3) combination.

3. **Culture media**

   Check the quality control data for media to ensure that they are within specifications and performing adequately.

4. **Equipment**

   Check that the equipment used for the procedures (incubators, refrigerators, measuring instruments) are calibrated and performing adequately.

5. **Staff training**

   Check that the staff performing the tests are fully trained and familiar with all the procedural steps.

6. **Clerical procedures**

   Check that the sample labeling, laboratory numbering and clerical procedures are adequate and that you have procedures for ensuring that test results are reported accurately and on time.

7. **Accreditation**

   Check that quality procedures are documented and adhered to at all times.

8. **Internal quality controls (IQC)**

   Ensure adequate controls are in place and follow-up procedures are in place to deal with IQC failures.

Further advice can be obtained from the FAO RC on request.

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