DIN EN ISO 19036:2020-05 (E)

Microbiology of the food chain - Estimation of measurement uncertainty for quantitive determinations (ISO 19036:2019)

Contents

Page

European foreword 4

Foreword 5

Introduction 6

1 Scope 7

2 Normative references 7

3 Terms,definitionsandsymbols 7
3.1 Terms and definitions 7
3.2 Symbols 10

4 General considerations 11

5 Technical uncertainty 12
5.1 Identification of main sources of uncertainty 12
5.1.1 General aspects 12
5.1.2 Sampling uncertainty 13
5.1.3 Bias 13
5.1.4 Critical factors 13
5.2 Estimation of technical uncertainty 14
5.2.1 General aspects 14
5.2.2 Reproducibility standard deviation derived from intralaboratory experiments, sIR 14
5.2.3 Reproducibility standard deviation derived from interlaboratory studies 19

6 Matrix uncertainty 20
6.1 General aspects 20
6.2 Case of homogeneous laboratory (or test) sample 21
6.3 Multiple test portions from laboratory samples 21
6.4 Known characteristic of the matrix 22

7 Distributional uncertainties 23
7.1 General aspects 23
7.2 Colony-count technique -- Poisson uncertainty 23
7.3 Colony-count technique -- Confirmation uncertainty 23
7.4 Most probable number uncertainty 24

8 Combined and expanded uncertainty 25
8.1 Combined standard uncertainty 25
8.1.1 General considerations 25
8.1.2 Combined standard uncertainty based on separate technical, matrix, and distributional standard uncertainties 25
8.1.3 Combined standard uncertainty based on reproducibility standard deviation alone 26
8.2 Expanded uncertainty 26
8.3 Worked examples 26
8.3.1 Example 1 -- Technical, matrix and Poisson components of uncertainty 26
8.3.2 Example 2 -- Poisson component negligible 26
8.3.3 Example 3 -- Poisson, matrix and confirmation components 27
8.3.4 Example 4 -- Technical, matrix and most probable number components 27

9 Expression of measurement uncertainty in the test reports 28
9.1 General aspects 28
9.2 Results below the limit of quantification 29
9.2.1 General aspects 29
9.2.2 Example 29

Annex A (informative) Calculation of standard deviations with two or more than two test portions (intralaboratory reproducibility standard deviation and matrix uncertainty standard deviation) 31

Annex B (informative) Matrix effect and matrix uncertainty 36

Annex C (informative) Intrinsic variability (standard uncertainty) of most probable number estimates 38

Annex D (informative) Correction of experimental standard deviations for unwanted uncertainty components 40

Bibliography 43