

DIN EN ISO 19036:2020-05 (E)

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

Contents		Page
European foreword		4
Foreword		5
Introduction		6
1	Scope	7
2	Normative references	7
3	Terms, definitions and symbols	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, s _{IR}	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