

ISO 13496:2021 (E)

Meat and meat products — Detection and determination of colouring agents

Contents

	Foreword
1	Scope
2	Normative references
3	Terms and definitions
4	Principle
4.1	Thin-layer chromatography
4.2	HPLC
5	Sampling
6	Preparation of test sample
7	Test method of thin-layer chromatography
7.1	Reagents
7.2	Apparatus
7.3	Procedure
7.3.1	Test portion
7.3.2	Fatty samples
7.3.3	Non-fatty samples
7.3.4	Transfer of the colours to polyamide powder
7.3.5	Elution and concentration of isolated colours
7.3.6	Thin-layer chromatographic separation
7.3.6.1	Standard reference plates
7.3.6.2	Samples
7.3.7	Confirmation
8	Test method of HPLC
8.1	Reagents
8.2	Apparatus
8.3	Procedure
8.3.1	Test portion
8.3.2	Fatty samples
8.3.3	Non-fatty samples
8.3.4	Transfer of the colours to polyamide powder
8.3.5	Elution and concentration of isolated colours
8.3.6	HPLC analysis
8.3.6.1	Operating conditions
8.3.6.2	Determination
8.3.6.3	Parallel test
8.3.6.4	Blank test
8.4	Calculation
8.5	Precision
8.6	Limit of detection (LOD) and limit of quantification (LOQ)
9	Test report
Annex A	(informative) Synonyms and identity numbers of synthetic, water-soluble colouring agents
Annex B	(informative) Possible interference by colours
B.1	Colours which do not interfere

B.2	Colours which can interfere
Annex C	(informative) Absorbance spectra
Annex D	(informative) Chromatogram and wavelength
D.1	Chromatogram of standard
D.2	Recommended wavelength of UV detector detection
Annex E	(informative) Interlaboratory testing
E.1	Overview
E.2	Statistical analysis of the test results of colouring agents
E.2.1	Tartrazine
E.2.1.1	Original test results
E.2.1.2	Cell means
E.2.1.3	Cell absolute differences
E.2.1.4	Scrutiny of results for consistency and outliers
E.2.1.4.1	Graphical consistency technique by Mandel's h and k statistics
E.2.1.4.2	Cochran's test
E.2.1.4.3	Grubbs' test
E.2.1.5	Calculation of the general mean and standard deviation
E.2.1.6	Dependence of precision on general mean, m
E.2.1.7	Final values of precision
E.2.2	New Red
E.2.2.1	Original test results
E.2.2.2	Cell means
E.2.2.3	Cell absolute differences
E.2.2.4	Scrutiny of results for consistency and outliers
E.2.2.4.1	Graphical consistency technique by Mandel's h and k statistics
E.2.2.4.2	Cochran's test
E.2.2.4.3	Grubbs' test
E.2.2.5	Calculation of the general mean and standard deviation
E.2.2.6	Dependence of precision on general mean, m
E.2.2.7	Final values of precision
E.2.3	Amaranth
E.2.3.1	Original test results
E.2.3.2	Cell means
E.2.3.3	Cell absolute differences
E.2.3.4	Scrutiny of results for consistency and outliers
E.2.3.4.1	Graphical consistency technique by Mandel's h and k statistics
E.2.3.4.2	Cochran's test
E.2.3.4.3	Grubbs' test
E.2.3.5	Calculation of the general mean and standard deviation
E.2.3.6	Dependence of precision on general mean, m
E.2.3.7	Final values of precision
E.2.4	Indigotine
E.2.4.1	Original test results
E.2.4.2	Cell means
E.2.4.3	Cell absolute differences
E.2.4.4	Scrutiny of results for consistency and outliers
E.2.4.4.1	Graphical consistency technique by Mandel's h and k statistics
E.2.4.4.2	Cochran's test
E.2.4.4.3	Grubbs' test
E.2.4.5	Calculation of the general mean and standard deviation
E.2.4.6	Dependence of precision on general mean, m
E.2.4.7	Final values of precision
E.2.5	Ponceau 4R
E.2.5.1	Original test results
E.2.5.2	Cell means
E.2.5.3	Cell absolute differences
E.2.5.4	Scrutiny of results for consistency and outliers
E.2.5.4.1	Graphical consistency technique by Mandel's h and k statistics
E.2.5.4.2	Cochran's test
E.2.5.4.3	Grubbs' test
E.2.5.5	Calculation of the general mean and standard deviation

E.2.5.6	Dependence of precision on general mean, m
E.2.5.7	Final values of precision
E.2.6	Sunset Yellow FCF
E.2.6.1	Original test results
E.2.6.2	Cell means
E.2.6.3	Cell absolute differences
E.2.6.4	Scrutiny of results for consistency and outliers
E.2.6.4.1	Graphical consistency technique by Mandel's h and k statistics
E.2.6.4.2	Cochran's test
E.2.6.4.2.1	General
E.2.6.4.2.2	Grubbs' test
E.2.6.5	Calculation of the general mean and standard deviation
E.2.6.6	Dependence of precision on general mean, m
E.2.6.7	Final values of precision
E.2.7	Allura Red AC
E.2.7.1	Original test results
E.2.7.2	Cell means
E.2.7.3	Cell absolute differences
E.2.7.4	Scrutiny of results for consistency and outliers
E.2.7.4.1	Graphical consistency technique by Mandel's h and k statistics
E.2.7.4.2	Cochran's test
E.2.7.4.3	Grubbs' test
E.2.7.5	Calculation of the general mean and standard deviation
E.2.7.6	Dependence of precision on general mean, m
E.2.7.7	Final values of precision
E.2.8	Brilliant Blue FCF
E.2.8.1	Original test results
E.2.8.2	Cell means
E.2.8.3	Cell absolute differences
E.2.8.4	Scrutiny of results for consistency and outliers
E.2.8.4.1	Graphical consistency technique by Mandel's h and k statistics
E.2.8.4.2	Cochran's test
E.2.8.4.3	Grubbs' test
E.2.8.5	Calculation of the general mean and standard deviation
E.2.8.6	Dependence of precision on general mean, m
E.2.8.7	Final values of precision
E.2.9	Carmoisine
E.2.9.1	Original test results
E.2.9.2	Cell means
E.2.9.3	Cell absolute differences
E.2.9.4	Scrutiny of results for consistency and outliers
E.2.9.4.1	Graphical consistency technique by Mandel's h and k statistics
E.2.9.4.2	Cochran's test
E.2.9.4.3	Grubbs' test
E.2.9.5	Calculation of the general mean and standard deviation
E.2.9.6	Dependence of precision on general mean, m
E.2.9.7	Final values of precision
E.2.10	Erythrosine
E.2.10.1	Original test results
E.2.10.2	Cell means
E.2.10.3	Cell absolute differences
E.2.10.4	Scrutiny of results for consistency and outliers
E.2.10.4.1	Graphical consistency technique by Mandel's h and k statistics
E.2.10.4.2	Cochran's test
E.2.10.4.3	Grubbs' test
E.2.10.5	Calculation of the general mean and standard deviation
E.2.10.6	Dependence of precision on general mean, m
E.2.10.7	Final values of precision
E.3	Conclusion