QCS

Quality in Chocolate Scheme

Scheme Description

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Record of issue status and modifications

ISSUE	ISSUE DATE	DETAILS	AUTHORISED BY
2	01/09/08	Updated with UKAS logo for single scope (0001) and removed reference to scheme year. Included details for electronic reporting.	T.Noblett
3	07/08/09	Operational issues common to all schemes moved into General Protocol. List of abbreviations added. New PORTAL system added. New parameters added for 2010. Amended range for Salmonella.	T.Noblett
4	20/08/10	Separated Appendix A by sample type to include description of sample format	T.Noblett
5	23/03/11	Change Of Address on Page 1	N.Stephenson
6	16/08/11	Details updated for 2012 scheme year	T.Noblett
7	July 2012	Yeast and mould added as parameters to sample 713	T. Noblett
8	Sep 2012	Updated units and ranges	T.Noblett
9	July 2013	Addition of new sample 717 on Chocolate matrix	S.Frisicaro
10	Sept 2013	Included microbiological method codes. Removed trial status from 717.	T.Noblett
11	Sept 2014	Minor standardisation amendments, e.g. logo and email addresses. Inclusion of traceability information in Appendix A. Inclusion of subcontracting information in 'Test Materials' section.	N. Mason
12	Sept 2015	Updated microbiology methods for all samples. Removed Hard Copy Report information.	A.Cheetham A.McCarthy
13	Oct 2015	Addition of sample 718 (metals in cocoa powder)	W Gaunt S Xystouris
14	Sept 2016	General update of appendices	W.Gaunt

Notes:
Where this document has been translated, the English version shall remain the definitive version

Scheme Aims and Organisation
The primary aim of the Quality in Chocolate Scheme (QCS) is to enable laboratories performing the analysis of chocolate and related products to monitor their performance and compare it with that of their peers. QCS also aims to provide information to participants on technical issues and methodologies relating to testing of chocolate and related products.

The QCS scheme year operates from January to December. Further information about QCS, including test material availability, round despatch dates and reporting deadlines, are available on the current QCS application form.

Test Materials
Details of test materials available in QCS are given in Appendix A. The test parameters are continually reviewed to ensure they meet the needs of current laboratory testing and regulatory requirements.

Test material batches are tested for homogeneity for at least one test parameter where deemed appropriate. Details of homogeneity tests performed and results are given in the QCS Scheme Reports.

Some aspects of the scheme, such as test material production, homogeneity testing and stability assessment, can from time to time be subcontracted. When subcontracting occurs, it is placed with a competent subcontractor and LGC is responsible for this work. The planning of the scheme, the evaluation of performance and the authorisation of the final report will never be subcontracted.

Statistical Analysis
Information on the statistics used in QCS can be found in the General Protocol and in the Scheme Report. Methods for determining assigned values and the values for SDPA used for individual samples are given in Appendix A

Methods
Methods are listed in Appendix A and PORTAL. Please select the most appropriate method from the list. If none of the methods are appropriate, then please report your method as ‘Other’ and record a brief description in the Comments Section in PORTAL.

Abbreviations for microbiological method codes can be found in Appendix A. The time and temperature of incubation does not need to be reported.

Results and Reports
QCS results are returned through our electronic reporting software, PORTAL, full instructions for which are provided by email. However, participants may request result submission forms on which to report and return results if they are unable to report through electronic means. This will incur an additional charge.

QCS reports will be available on the website within 10 working days of round closure. Participants will be emailed a link to the report when it is available.

APPENDIX A - Description of abbreviations used

Assigned Value (AV)

The assigned value may be derived in the following ways:

- From the robust mean (median) of participant results (RMean). This is the median of participant results after the removal of test results that are inappropriate for statistical evaluation, e.g. miscalculations, transpositions and other gross errors. Generally, the assigned value will be set using results from all methods, unless the measurement is considered method-dependant, in which case the assigned value will be set by method and indicated in the report tables.
  For some analytes, where there is a recognised reference method for that type of measurement, this may be used as the assigned value for a particular analyte i.e. it would be applied to results obtained by any method.

  Traceability: Assigned values which are derived from the participant results, or a sub-set of the results are not traceable to an international measurement standard. The uncertainty of assigned values derived in this way is estimated from the participant results, according to ISO 13528.

- From a formulation value (Form). This denotes the use of an assigned value derived from sample preparation details, where known and exact quantities of analyte have been used to prepare the sample.

  Traceability: Assigned values calculated from the formulation of the test sample are traceable, via an unbroken metrological traceability chain, to an international measurement standard. The measurement uncertainty of the assigned value is calculated using the contributions from each calibration in the traceability chain.

- From a qualitative formulation (Qual Form). This applies to qualitative tests where the assigned value is simply based on the presence/absence of the analyte in the test material.

  Traceability: Assigned values calculated from the qualitative formulation of the test sample are traceable to a certified reference standard or a microbiological reference strain.

- From expert labs (Expert). The assigned value for the analyte is provided by an 'expert' laboratory.

  Traceability: Assigned values provided by an 'expert' laboratory may be traceable to an international measurement standard, according to the laboratory and the method used. The uncertainty of measurement for an assigned value produced in this way will be provided by the laboratory undertaking the analysis. Details of traceability and the associated uncertainty will be provided in the report for the scheme/round.

Range

This indicates the concentration range at which the analyte may be present in the test material.

SDPA

The SDPA represents the 'standard deviation for proficiency assessment' which is used to assess participant performance for the measurement of each analyte. This may be a fixed value (as stated), a percentage (%) of the assigned value or based on the robust standard deviation of the participant measurement results, either across all methods or by method depending on whether the measurement made is method dependent (see assigned value).

Units
This indicates the units used for the assessment of data and in which participants should report their results. For some analytes in some schemes participants may have a choice of which units to report their results, however, the units stipulated in this scheme description are the default units to which any results reported using allowable alternative results will be converted to.

DP
This indicates the number of decimal places to which participants should report their measurement results.

ABBREVIATIONS FOR MICROBIOLOGICAL METHOD CODES

PCR = Polymerase chain reaction
KA = Kanamycin aesculin
SB = Slanetz and Bartley
DG18 = Dichloran 18% glycerol
RB = Rose bengal
VRBA = Violet red bile
VRBGA = Violet red glucose
TBX = Tryptone bile x-glucuronide
YGC = Yeast glucose chloramphenicol
DRBC = Dichloran rose bengal chloramphenicol
OGYE= Oxytetracycline glucose yeast extract

All analytes will also have 'OTHER' as a method choice in case your method is not listed

APPENDIX A

Sample 710/711/712 **Presence/absence of Salmonella in Chocolate**
Supplied as: 25g of grated chocolate

Analyte	Method	AV	Range	SDPA	Units	DP
Detection of *Salmonella* species	Enrichment/culture VIDAS PCR TECRA Rapid test (various) Chromogenic agar ELISA	Qual Form	0 to 1,000	NA	cfu $25g^{-1}$	NA

Sample 713 **Enumeration of Indicator Organisms in Cocoa Powder**
Supplied as: 10g of cocoa powder

Analyte	Method	AV	Range	SDPA	Units	DP
Total aerobic mesophilic count	Plate count agar Milk Plate count agar Petrifilm	RMean	0 to 100,000	log_{10} 0.35	cfu g^{-1}	0
Enumeration of Enterococci	KAA agar SB agar KF agar	RMean	0 to 100,000	log_{10} 0.35	cfu g^{-1}	0
Enumeration of Enterobacteriaceae	VRBGA Petrifilm MPN	RMean	0 to 100,000	log_{10} 0.35	cfu g^{-1}	0
Enumeration of Coliforms	VRBA MPN Petrifilm COLI ID Chromogenic agar	RMean	0 to 100,000	log_{10} 0.35	cfu g^{-1}	0
Enumeration of yeast Enumeration of mould	DG18 DRBC RB agar YGC agar OGYE agar Malt Extract agar Petrifilm	RMean	0 to 100,000	log_{10} 0.35	cfu g^{-1}	0

Sample 714 **Presence/absence of Salmonella in Cocoa Powder**
Supplied as: 25g of cocoa powder

Analyte	Method	AV	Range	SDPA	Units	DP
Detection of *Salmonella* species	Enrichment/culture VIDAS PCR TECRA Rapid test (various) Chromogenic agar ELISA	Qual Form	0 to 1,000	NA	cfu $25g^{-1}$	NA

Sample 715 **Chocolate analysis**
Supplied as: 150g of chocolate

Analyte	Method	AV	Range	SDPA	Units	DP
Fat	All	RMean	All	0.50%	%	2
Total nitrogen	All	RMean	All	Robust SD	%	2
Total sugars	All	RMean	All	Robust SD	%	2
Moisture	All	RMean	All	0.20%	%	2
Butyric acid	All	RMean	All	Robust SD	%	2
Theobromine	All	RMean	All	Robust SD	%	2

Sample 716 **Cocoa Powder analysis**
Supplied as: 150g of cocoa powder

Analyte	Method	AV	Range	SDPA	Units	DP
Fat	All	RMean	All	0.50%	%	2
Ash	All	RMean	All	0.20%	%	2
Moisture	All	RMean	All	0.20%	%	2
Theobromine	All	RMean	All	0.20%	%	2

Sample 717 **Enumeration of Indicator Organisms in Chocolate**
Supplied as: 10g of chocolate

Analyte	Method	AV	Range	SDPA	Units	DP
Total aerobic mesophilic count	PCA Petrifilm	RMean	0 to 100,000	log_{10} 0.35	cfu g^{-1}	0
Enumeration of Enterococci	KAA agar SB agar KF agar	RMean	0 to 100,000	log_{10} 0.35	cfu g^{-1}	0
Enumeration of Enterobacteriaceae	VRBGA Petrifilm MPN	RMean	0 to 100,000	log_{10} 0.35	cfu g^{-1}	0
Enumeration of Coliforms	VRBA MPN Petrifilm Chromogenic agar COLI ID	RMean	0 to 100,000	log_{10} 0.35	cfu g^{-1}	0
Enumeration of yeast Enumeration of mould	DG18 DRBC RB agar YGC agar OGYE agar MEA Petrifilm	RMean	0 to 100,000	log_{10} 0.35	cfu g^{-1}	0

Sample 718* **Elements in cocoa powder**
Supplied as: 10g cocoa powder product

Analyte	Method	Range	AV	SDPA	Units	DP
Total Arsenic	All	All	Median	Robust SD	mg/kg	2
Cadmium	All	All	Median	Robust SD	mg/kg	2
Lead	All	All	Median	Robust SD	mg/kg	2

*Test materials currently not included in LGC's UKAS Scope of Accreditation