Scheme Description

Sugar (SUPS)
Proficiency Testing Scheme

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RECORD OF ISSUE STATUS AND MODIFICATIONS

Issue	Issue Date	Details	Authorised by
16	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'	N. Mason
17	Sept 2015	Inclusion of cadmium and mercury to sample 2. Addition of sulfated ash to sample 5. New sample 10 Moisture in white sugar added to the scheme. Changes to the SDPA for sample 7 Raw sugar. Removed Hard copy report information.	K. Baryla A. McCarthy
18	March 2016	Inclusion of fermentable sugars to sample 5. A new method added to sample 2.	K. Baryla
19	Sept 2016	A new method added to sample 2. Sample 9 Stevia removed.	K. Baryla
20	Sept 2017	Scheme aims and organisation paragraph updated.	K. Baryla
21	Sept 2018	Updated details to 'ALL' for microbiology samples and amended Methods paragraph.	K. Carey
22	Aug 2019	Added HFCS sample, added colour to sample 5	R. Connolly S. Xystouris
23	Sep 2020	Updated UKAS logo and minor amendments	A McCarthy
24	July 2021	Updated email address and UKAS logo Increased volume of sample 11 Added extra method information to sample 7	A Collins R. Connolly
25	Sept 2022	Updated logo Added new analytes in Sample 5	A Collins S. Xystouris
26	Sept 2023	Microbiology ranges updated, units changed to reporting units. Removal of sample 11 (HFCS)	K.Carey R. Connolly
27	July 2024	Update of ICUMSA methods	R. Connolly
28	July 2025	Update SDPA for sample 10 moisture to 0.006 Added "white refined" to name for sample 1, 2, 3, 4, 10	S.Bladowska
29	May 2026	New UKAS logo added	A Collins
30	July 2026	UKAS logo update, remove ILAC	A Collins

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

SCHEME INFORMATION

Scheme Aims and Organisation

The primary aim of the sugar proficiency testing scheme (SUPS) is to enable laboratories performing the analysis of sugar and sugar products to monitor their performance and compare it with that of their peers. SUPS also aims to provide information to participants on technical issues and methodologies relating to testing of these materials.

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

LGC Standards cooperates with the International Commission for Uniform Methods of Sugar Analysis (ICUMSA). The purpose of this organisation is to provide robust, internationally developed methods of analysis to aid the trade in sugar and sugar products. The ICUMSA representatives are involved in the review of progress and performance of the scheme and provide advice on operation and future development of the scheme.

Test Materials

Details of test materials available in SUPS are given in the 'Samples Available' section. 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 SUPS 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 SUPS 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 the 'Samples Available' section.

Methods

For most analytes, unless a specific method is stated, then any appropriate method can be used to perform the testing, Methods are listed in 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.

Results and Reports

SUPS results are returned through our electronic reporting software, PORTAL, full instructions for which are provided by email.

SUPS 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.

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.

SAMPLES AVAILABLE

Sample PT-PC-01 **Chemical analysis of sugar**
Supplied as: 300ml pot of white refined cane or beet sugar

Analyte	Method	Range	AV	SDPA	Units	DP
Colour	GS2-9 (previously GS2 / 3-9)	0 to 20 21 or above	RMean	15% of AV 10% of AV (min value 1)	IU	0
	GS2-10 (previously GS2 / 3-10)				IU	0
	GS9-8 (previously GS9 / 1 / 2 / 3-8)				IU	0
Turbidity	GS2-18 (4cm cell) (previously GS2 / 3-18 4cm)	0 to 20 21 or above	RMean	20% of AV (min value 1) 15% of AV	IU	0
	GS2-18 (5cm cell) (previously GS2 / 3-18 5cm)					
	GS2-18 (10cm cell) (previously GS2 / 3-18 10cm)					
	GS2-18 (flow cell) (previously GS2 / 3-18 flow cell)					
	GS2-18 (other cell) (previously GS2 / 3-18 other)					
Ash	GS2-17 (previously GS2 / 3-17)	All	RMean	10% of AV (min 0.001)	% m/m	3
Reflectance grade	GS2-13	≤1 >1	RMean	25% of AV 10% of AV	-	1

Sample PT-PC-02 **Metals analysis in sugar**
Supplied as: 200g bag of white refined cane or beet sugar

Analyte	Primary Method	Secondary Method	Range	AV	SDPA	Units	DP
As	GS2-25 (previously GS2 / 3 / 9-25)	AAS	All	RMean	20% of AV	mg/kg	2
	GS2-23 (previously GS2 / 3-23)	ICP-MS					
	GS2-51	ICP-OES					
	GS9-1						
Pb	GS2-27 (previously GS2 / 1 / 3-27)	AAS	All	RMean	20% of AV	mg/kg	2
	GS2-24 (previously GS2 / 3-24)	ICP-MS					
	GS2-51	ICP-OES					
	GS9-1						
Cu	GS2-29 (previously GS2 / 3-29)	AAS	All	RMean	20% of AV	mg/kg	2
	GS2-51	ICP-MS					
	GS9-1	ICP-OES					
	GS9-9						

Analyte	Primary Method	Secondary Method	Range	AV	SDPA	Units	DP
Fe	GS2-31 (previously GS2 / 3 / 7 / 8-31)	AAS	All	RMean	20% of AV	mg/kg	2
	GS2-51	ICP-MS					
	GS9-10	ICP-OES					
Cd*	GS9-1	AAS	All	RMean	20% of AV	mg/kg	2
	GS9-11	ICP-MS					
	GS2-51	ICP-OES					
Hg*	GS9-1	HG-AAS	All	RMean	20% of AV	mg/kg	2
	GS9-12	AAS					
		ICP-MS					
		ICP-OES					

*analytes marked with an asterisk are not included in LGC's UKAS scope of accreditation

Sample PT-PC-03 **Chemical analysis of sugar**
Supplied as: 300ml pot of white refined cane or beet sugar

Analyte	Primary Method	Secondary Method	Range	AV	SDPA	Units	DP
Sulfur dioxide	GS2-33 (previously GS2 / 1 / 7-33)	Spectrophotometer	<1 ≥1	RMean	0.30 25% of AV	mg/kg (as SO_2)	1
	GS2-35	Titration					
Reducing sugars	GS2-5 (previously GS2 / 3 / 9-5)		All	RMean	25% of AV (min 0.001)	% m/m	3
	GS2-6 (previously GS2 / 9-6)						
Polarimetric sucrose content *(previously Polarisation)*	GS2-1 (previously GS2/3-1)	Gravimetric	All	RMean	0.06	˚Z	2
		Volumetric					

Sample PT-PC-04 **Sediment analysis in sugar**
Supplied as: 500ml pot of white refined cane or beet sugar

Analyte	Method	Range	AV	SDPA	Units	DP
Sediment (insoluble)	GS2-19 (previously GS2 / 3 / 9-19)	All	RMean	25% of AV	mg/kg	1

Sample PT-PC-05 **Chemical analysis of molasses**
Supplied as: 200g molasses

Analyte	Method	Range	AV	SDPA	Units	DP
Sucrose	GS4-7* (previously GS4/3-7) GS4-9* (previously GS4/3-9) GS4-1 (previously GS4/7-1) HPLC-IC	All	RMean	0.75	% m/m	2
Reducing Sugars	GS4-3 (previously GS4 / 3-3) GS4-5	All	RMean	10% of AV	% m/m	2
pH	GS1-23 (previously GS1/2/3/4/7/8-23)	All	RMean	0.10	-	2
Total sugar as invert sugar (TSAI)	HPLC	All	RMean	Robust SD	% m/m	2
Total sugar as reducing sugar (TSRS)	GS4-7 (Lane-Eynon) AOAC 968.28 AOAC 923.09 ISO 5377:1981	All	RMean	Robust SD	% m/m	2
Dry Substance	GS4-13 (previously GS4 / 3-13) GS4-11 (previously GS4 / 7-11) GS4-12**	All	RMean	1.5	% m/m	1
Sulfated ash	GS3-11 (previously GS3/4/7/8-11)	All	RMean	Robust SD	% m/m	2
Fermentable sugars***	AOAC	All	RMean	Robust SD	%	2
Colour***	GS1-7 (previously GS1/3-7) GS9-8 (previously GS9/1/2/3-8)	All	RMean	Robust SD	IU	0

*Method requires correction for the amount of invert glucose and fructose present in order to report sucrose and not total sugars.
**Method requires correction before reporting as dry substance as GS4-12 measures moisture.
*** Not included in LGC's UKAS scope of accreditation.

Sample PT-PC-07 **Chemical analysis of raw sugar**
Supplied as: 500g of raw sugar sample

Analyte	Method	Range	AV	SDPA	Units	DP
Ash	GS1-10 (sulphated ash) GS1-13 (conductivity ash) (previously GS1/3/4/7/8-13)	All	RMean	10% of AV	% m/m	3
Colour	GS1-7 (previously GS1/3-7) GS9-8 (previously GS9/1/2/3-8)	All	RMean	10% of AV	IU	0
Dextran	GS1-15 (previously GS1/2/9-15)	All	RMean	Robust SD	mg/kg	0
Moisture *(dry substance/water content)*	GS2-15 (previously GS2/1/3/9-15)	All	RMean	0.03	% m/m	2
Polarimetric sucrose content *(previously Polarisation)*	GS1-1 (previously GS1/2/3/9-1) (choice of clarification agent as secondary method GS1-2 (previously GS1/2/3-2)	All	RMean	0.15	˚Z	2
Reducing sugars	GS1-3 (previously GS1/3/7-3) GS1-4 (previously GS1/2/3-4) GS1-5	All	RMean	15% of AV	% m/m	2
Starch	GS1-16 GS1-17	All	RMean	20% of AV	mg/kg	0

Sample PT-PC-10* **Chemical analysis of sugar**
Supplied as: 75g of white refined cane or beet sugar

Analyte	Method	Range	AV	SDPA	Units	DP
Moisture	GS2-15 (previously GS2/1/3-15) GS4-12 IR drying NIR Other Karl Fischer	All	RMean	0.006	%(m/m)	3

*Not included in LGC's UKAS Scope of Accreditation

Sample PT-SM-06 **Microbiological analysis of sugar**
Supplied as: Lyophilised material

Analyte	Method	Range cfu/100mL	AV	SDPA	Reporting units	DP
Total aerobic mesophilic count	ALL	0 - 1000	RMean	0.35	cfu/100mL	0
Enumeration of Yeast	ALL	0 - 1000	RMean	0.35	cfu/100mL	0
Enumeration of Mould	ALL	0 - 1000	RMean	0.35	cfu/100mL	0
Enumeration of Osmophilic yeast	ALL	0 - 1000	RMean	0.35	cfu/100mL	0
Enumeration of Osmophilic mould	ALL	0 - 1000	RMean	0.35	cfu/100mL	0

Sample PT-SM-08 **Microbiological analysis of sugar**
Supplied as: Lyophilised material

Analyte	Method	Range cfu/100mL	AV	SDPA	Reporting units	DP
Enumeration of thermophilic acidophilic bacteria	MF BAT AGAR	0 - 1000	RMean	0.35	cfu/100mL	0
Detection of guaiacol producing thermophilic acidophilic bacteria	MF BAT AGAR	0 - 1000	Qual form	N/A	Detected/Not detected 100mL	N/A

All the methods listed can be obtained from ICUMSA website at http://www.icumsa.org