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SUGAR PROFICIENCY TESTING SCHEME

Report to Participants

Round: 70
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Summary Information

Round: 70

Contact details for SUPS

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This round was conducted in accordance with the SUPS Scheme description.

- Samples were despatched on: 7 Jan 2008
- Sample analysis start date: 19 May 2008
- Result deadline: 27 May 2008
- Number of potential participants: 60
- Number of participants submitting results: 56

The sample for this round was granulated Beet sugar from Danisco Sugar.

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Advisory Group

Advisory Group

The SUPS Advisory Group is responsible for the overall direction of the scheme.

- The terms of reference of the Advisory Group are given in the scheme description.

Advisory Group Composition

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Results and Z scores

Calculation of Z scores

STATISTICS

Robust Statistics, used in SUPS as it removes the need to eliminate outliers from data sets, are used to generate the assigned value, the Robust Mean (alternatively called Median). The Established Standard Deviation, used in calculating Z-scores, is fixed through discussions at Advisory Group Meetings, based on the Robust Standard Deviation over previous rounds and incorporates fitness for purpose criteria.

The Z-score is a statistically derived performance score which makes a comparison of the measurement result reported by a participant with the Assigned Value of the test material taking account of the acceptable spread of results (Established Standard Deviation) for the particular analyte/method. Participants must always take account of other factors when interpreting the Z-score given, such as the appropriateness of the result reported, how the assigned value and established standard deviation are derived, the total number and distribution of results etc, as well as monitoring trends from round to round. Thus a single Z-score should not be interpreted in isolation.

The Z score for an individual result, x_i is calculated from the equation:

$$\text{Z score} = \frac{x_i - \text{"assigned value"}}{\text{"established standard deviation"}}$$

The assigned value is the robust mean for a particular analyte where only one method has been used. Where more than one method is available, the grand robust mean across all methods will be applied.

The established standard deviation is based on a fixed percentage of the assigned value.

Analyte	Level	ESD
Colour	0 to 20	15% of assigned value*
	21 or greater	10% of assigned value
Turbidity	0 to 20	20% of assigned value
	21 or greater	15% of assigned value
Ash	All levels	10% of assigned value**

*with a minimum value of 1

**with a minimum value of 0.001

The statistical values presented in the report are rounded to a predetermined number of decimal places, usually 2 or 3. Participants' Z-scores are calculated by PTManager using unrounded values. If participants wish to calculate their own Z-score results, please note that the Z-score may be different when using the rounded values.

The magnitude of the Z score can be interpreted by using the following scale

$ Z \leq 2$	Satisfactory
$2 < Z < 3$	Questionable
$3 \leq Z $	Unsatisfactory

Sample: Sugar

Results and Z Scores

Analyte Method	Colour						Turbidity		Ash	
	GS2/3-9		GS2/3-10		GS9/1/2/3-8		GS2/3-18		GS2/3-17	
Unit	ICUMSA Units		ICUMSA Units		ICUMSA Units		ICUMSA Units		% m/m	
Participant ID	Result	Z Score	Result	Z Score	Result	Z Score	Result	Z Score	Result	Z Score
5			30	0.00			82	-0.16	0.015	0.00
6			37	2.33			85	0.08	0.016	0.67
7			28	-0.67			78	-0.48	0.017	1.33
8			31	0.33			84	0.00	0.015	0.00
9	29	-0.33					73	-0.87	0.015	0.00
10			28	-0.67			83	-0.08	0.016	0.67
11			31	0.33			85	0.08	0.015	0.00
13			32	0.67			83	-0.08	0.016	0.67
16			32	0.67			88	0.32	0.015	0.00
17			27	-1.00			84	0.00	0.014	-0.67
18			33	1.00			82	-0.16	0.014	-0.67
20			22	-2.67			81	-0.24	0.015	0.00
21			32	0.67			97	1.03	0.014	-0.67
22			30	0.00			75	-0.71	0.016	0.67
23			28	-0.67			77	-0.56	0.016	0.67
24			24	-2.00			82	-0.16	0.016	0.67
26			28	-0.67			95	0.87	0.015	0.00
27			29	-0.33			87	0.24	0.015	0.00
29	33	1.00	34	1.33			93	0.71	0.147	>4
30			31	0.33			85	0.08	0.016	0.67
31			29	-0.33			83	-0.08	0.016	0.67
32					31	0.33	91	0.56	0.016	0.67
33			32	0.67			85	0.08	0.015	0.00
35			31	0.33			84	0.00	0.015	0.00
36			24	-2.00			85	0.08	0.017	1.33
37	29	-0.33	31	0.33			120	2.86	0.015	0.00
40			34	1.33			86	0.16	0.015	0.00
42			29	-0.33			81	-0.24	0.015	0.00
47			28	-0.67			79	-0.40	0.016	0.67
50	43	>4					82	-0.16	0.014	-0.67
51					30	0.00	72	-0.95	0.017	1.33
52			27	-1.00			84	0.00	0.015	0.00
53			33	1.00			78	-0.48	0.015	0.00
56	27	-1.00					83	-0.08	0.018	2.00
57			32	0.67			82	-0.16	0.015	0.00
58			29	-0.33			88	0.32	0.014	-0.67
63			34	1.33			75	-0.71	0.015	0.00
64	22	-2.67					98	1.11	0.014	-0.67
66			28	-0.67			78	-0.48	0.015	0.00
67			32	0.67			84	0.00	5.6	>4
80			32	0.67			102	1.43	0.015	0.00
81			30	0.00			72	-0.95	0.017	1.33
83	24	-2.00					77	-0.56	0.019	2.67
84			24	-2.00			130	3.65	0.012	-2.00
86			28	-0.67			90	0.48	0.014	-0.67
87			27	-1.00			87	0.24	0.012	-2.00
88			30	0.00			27	<-4	0.011	-2.67
89	30	0.00	31	0.33	32	0.67	84	0.00	0.014	-0.67
90			30	0.00			75	-0.71	0.013	-1.33
97			32	0.67			84	0.00	0.015	0.00
101			38	2.67					0.015	0.00
102			22	-2.67			91	0.56	0.013	-1.33
103			30	0.00			153	>4	0.013	-1.33
104	38	2.67					106	1.75	0.015	0.00
105			37	2.33			97	1.03	0.019	2.67
106			28	-0.67			86	0.16	0.016	0.67
No of Results	9		48		3		55		56	
Robust Mean	29.00		30.00		31.00		84.00		0.015	
Mean	30.56		29.98		31.00		86.15		0.117	
Robust SD	5.932		2.966		1.483		5.932		0.0015	
StDev	6.617		3.467		1.000		16.006		0.7462	

Analyte	Colour						Turbidity		Ash	
Method	GS2/3-9		GS2/3-10		GS9/1/2/3-8		GS2/3-18		GS2/3-17	
Unit	ICUMSA Units		ICUMSA Units		ICUMSA Units		ICUMSA Units		% m/m	
Participant ID	Result	Z Score	Result	Z Score	Result	Z Score	Result	Z Score	Result	Z Score
Assigned Value	30.00		30.00		30.00		84.00		0.015	
Uncertainty of Assigned Value	0.4710		0.4710		0.4710		0.9838		0.0002	
Established SD	3.000		3.000		3.000		12.600		0.002	
Grand Robust Mean	30.00									
Grand Robust SD	2.966									
Grand Total No of Results	60									

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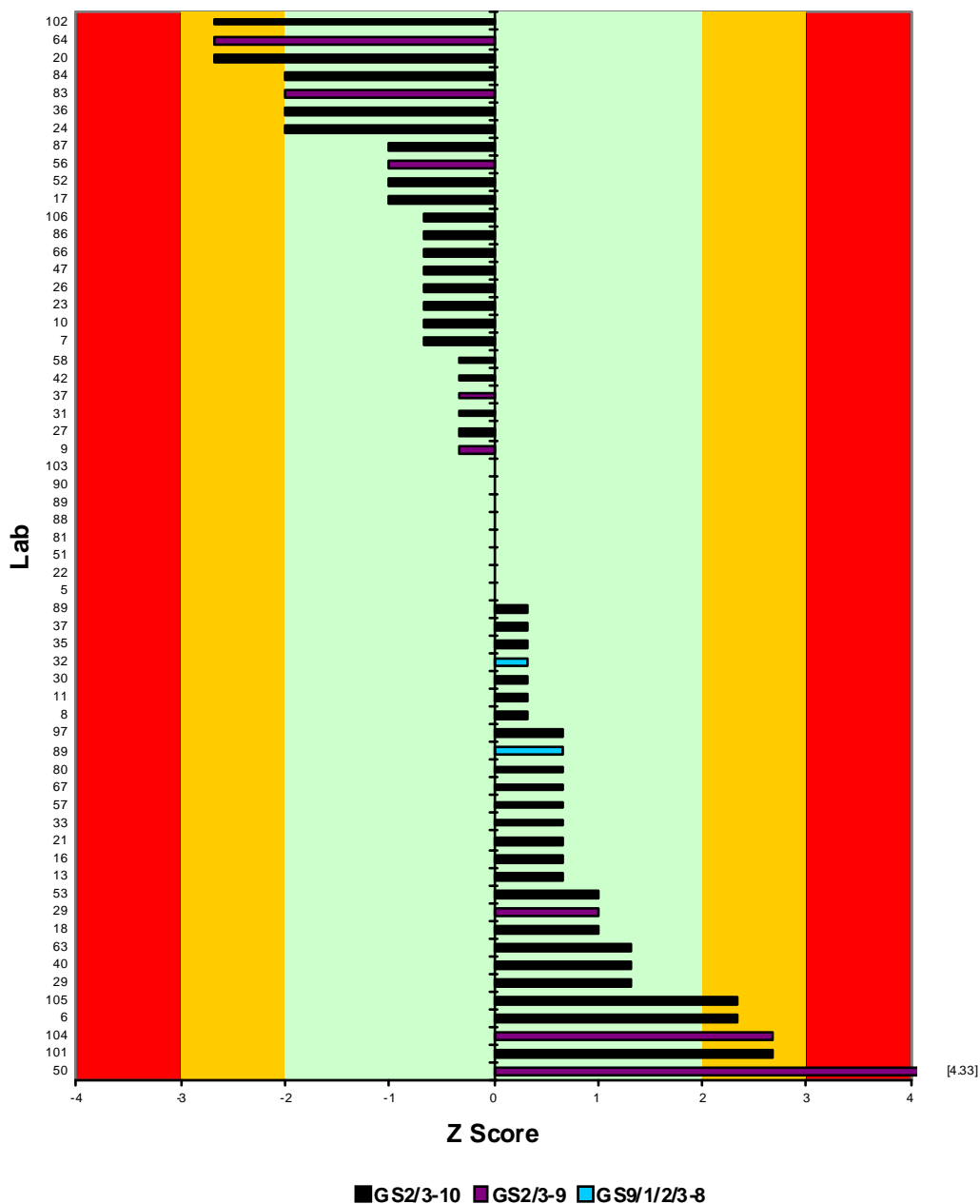
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Z Plots

Sample: Sugar

Analyte: Colour Method: Multiple (see legend)

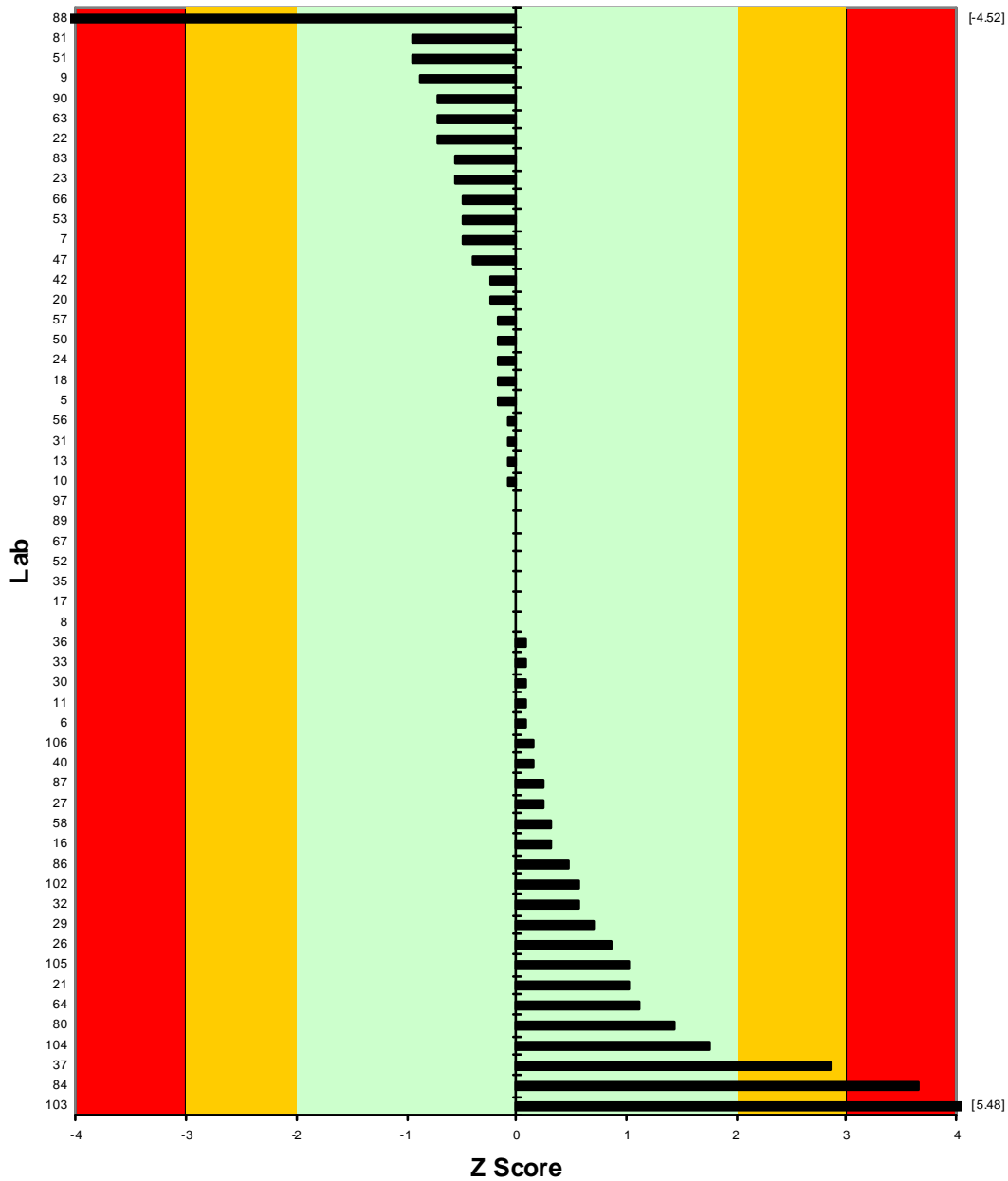
	Total	GS2/3-10	GS2/3-9	GS9/1/2/3-8
No of Results	60	48	9	3
Robust Mean	30.00	30.00	29.00	31.00
Mean	30.18	29.98	30.56	31.00
Robust SD	2.966	2.966	5.932	1.483



Sample: Sugar

Analyte: Turbidity Method: GS2/3-18

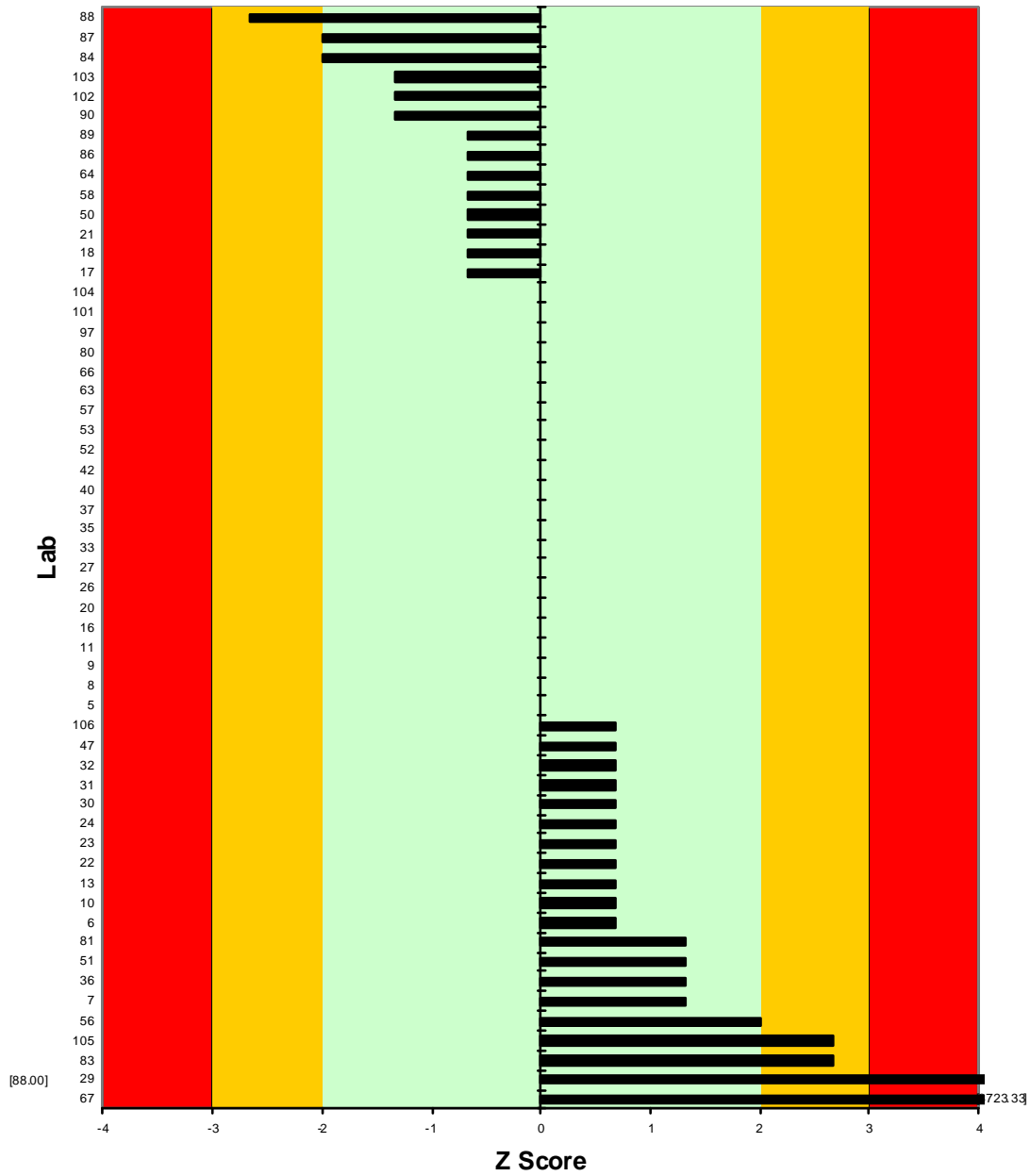
	GS2/3-18
No of Results	55
Robust Mean	84.00
Mean	86.15
Robust SD	5.932



Sample: Sugar

Analyte: Ash Method: GS2/3-17

	GS2/3-17
No of Results	56
Robust Mean	0.015
Mean	0.117
Robust SD	0.0015



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Efficacy Measures

Calculation of Efficacy Measures

Efficacy 1

Efficacy 1 is the percentage of Z scores that fall into the categories of satisfactory, questionable and unsatisfactory. If the set of participant results for a particular analyte conforms to a well behaved system these efficacy values should be approximately:

- Satisfactory: 90%
- Questionable: 5%
- Unsatisfactory: 5%

Efficacy 9

Efficacy 9 is the ratio of the sample standard deviation to the robust standard deviation. If the set of participant results for a particular analyte conforms to a well behaved system the value should be approximately between 0.5 and 2 (the fewer the number of outliers and the more normal the distribution the closer the value is to 1).

Individual Method Efficacy Table

Round 70 Test Sample Sugar		Analyte/Method							
Analyte	Method	# Results	Efficacy 1						Efficacy 9
			Satisfactory		Questionable		Unsatisfactory		
Colour	GS2/3-9	9	6	66.7%	2	22.2%	1	11.1%	1.12
Colour	GS2/3-10	48	43	89.6%	5	10.4%	0	0.0%	1.17
Colour	GS9/1/2/3-8	3	3	100.0%	0	0.0%	0	0.0%	0.67
Turbidity	GS2/3-18	55	51	92.7%	1	1.8%	3	5.5%	2.70
Ash	GS2/3-17	56	51	91.1%	3	5.4%	2	3.6%	503.17
Total		171	154	90.06%	11	6.43%	6	3.51%	

Combined Method Efficacy Table

Test Sample Sugar								
Analyte	# Results	Efficacy 1						Efficacy 9
		Satisfactory		Questionable		Unsatisfactory		
Colour	60	52	86.67%	7	11.67%	1	1.67%	1.33

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Homogeneity Data

Homogeneity Data: Bulk Beet Sugar

Analyte	Method	Units	TSD	Mean	Sv	C _v
Colour	GS 2/3-10	ICUMSA units (IU)	3.14	31.4000	0.0000	2.5772
Turbidity	GS 2/3-18	ICUMSA units (IU)	1.43	7.1500	0.0000	0.6995
Ash	GS 2/3-17	% m/m	0.001	0.0300	0.0000	0.0000

All analyses were performed by Danisco Sugar, in duplicate on 10 randomly selected samples following aliquoting.

TSD represents target standard deviation

S_v represents the sampling variance

C_v represents the critical value for the allowable sampling variance

If the sampling variance is less than the critical value for the allowable sampling variance, it indicates that the material is sufficiently homogeneous for use in this Proficiency Testing scheme.

For any analyte which is not proved to be homogeneous, the fixed value for the established standard deviation may be suspended in order to take account of any potential inhomogeneity. The actual value used for the established standard deviation is shown at the foot of the results and z score tables in this report.

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