

WINE ROUND 14

PROFICIENCY TESTING PROGRAM

MARCH 2006

REPORT NO. 502

ACKNOWLEDGMENTS

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APPENDIX A

Results, Summary Statistics and Z-Score Charts

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1. **FOREWORD**

This report summarises the results of a proficiency testing program on the chemical testing of wine.

NATA's Proficiency Testing Group conducted the exercise in November 2005 as part of its laboratory accreditation activities. Note that from 1 January 2006 the delivery of proficiency testing services was transferred from NATA to a new, wholly owned subsidiary called Proficiency Testing Australia (PTA).

The aim of the program was to assess laboratories' ability to competently perform the tests examined.

2. **FEATURES OF THE PROGRAM**

- 2.1 Results were received from 16 laboratories, with one laboratory (code 2) submitting two sets of results and one laboratory submitting three sets of results (code 5).
- 2.2 The results, as reported by participants, are presented in Appendix A. Summary statistics are calculated from the results reported for each test. These are presented in Table A (page 2). Robust z-scores and z-score charts are presented in Appendix A. A listing of laboratories (by code number) identified as having reported outliers are presented in Table B (page 3).
- 2.3 Appendix B contains the results of the homogeneity testing on the samples used in the program.
- 2.4 Laboratories were requested to perform the tests according to the *Instructions to Participants* and to record their results on the accompanying *Results Sheet*, both of which were distributed to participants with their samples.

Copies of the *Instructions to Participants* and *Results Sheet* are given in Appendix C of this report.

- 2.5 Each laboratory was randomly allocated a code number for the program to allow for the confidential treatment of results. Reference to any laboratory in this report is made by its code number.

3. **DESIGN OF PROGRAM**

- 3.1 For this program each participant was provided with two 750 mL samples, one of white wine (labelled 1) and one of red wine (labelled 2).

The following tests were to be conducted on each sample:

- Total Acidity
- Volatile Acidity
- Actual Alcohol
- Total Sulfur Dioxide
- Reducing Sugars

- 3.2 Robust statistical procedures were used to generate the z-scores and summary statistics for each sample and for each test - number of results, median, normalised interquartile range, minimum, maximum and range.

- 3.3 Robust z-scores were calculated based on the average of results submitted for each test. Where only one result was submitted, this result was used to determine the z-score.

TABLE A: SUMMARY STATISTICS

Analysis	Sample No.	No. of Results	Median (g/L)	Normalised IQR
Total Acidity	1	14	6.60	0.07
	2	14	6.28	0.11
Volatile Acidity	1	15	0.305	0.046
	2	15	0.400	0.024
Actual Alcohol	1	18	13.10	0.16
	2	18	14.68	0.14
Total Sulfur Dioxide	1	16	113.8	3.0
	2	16	65.5	6.6
Reducing Sugars	1	18	3.10	0.69
	2	18	7.13	1.34

4. **OUTLIER RESULTS**

In order to achieve the program's aim of assessing laboratories' testing performance, a robust statistical approach, which uses z-scores to assess participants' performance, has been utilised. The z-score is a measure of how far the results are from the consensus value - a normalised value which gives a "score" to each result relative to the other results in the group. Therefore a z-score close to zero means that the result agrees well with those from other laboratories. An outlier is any result which has an absolute z-score value greater than three and is marked by the symbol §.

Each determination was examined for outliers with all methods pooled. Table B summarises the outliers detected.

TABLE B: OUTLIER RESULTS
(by laboratory code number)

Test	Sample 1	Sample 2
Total Acidity	9, 12, 14	-
Volatile Acidity	2a, 7, 12	2a, 12, 14, 15
Actual Alcohol	-	1
Total Sulfur Dioxide	-	4
Reducing Sugars	2a, 3	-

5. **STATISTICAL FORMAT**

For each test, the following information is given:

- (a) a table of results and calculated z-scores;
- (b) a list of summary statistics; and
- (c) ordered z-score charts;

(a) **Table of Results and Z-Scores**

Each of these tables contains the results returned by each laboratory, including the code number for the method used, and the laboratory z-scores calculated for based on each laboratory's averaged results.

Note that results have been entered exactly as reported by participants. That is, laboratories which did not report results to the precision (i.e. number of significant figures) requested on the Results Sheet have **not** been rounded to the requested precision before being included in the statistical analysis.

Outliers are identified in the table by a marker (**\$**) next to the relevant z-score. Please see reference [1] for details on how these z-scores are calculated.

(b) **Summary Statistics**

The list of summary statistics appears at the bottom of the table of results and consists of:

- (i) the number of results for that test/sample (*No. of Results*);
- (ii) the median of laboratory's results - i.e. the middle value (*Median*);
- (iii) the normalised interquartile range of the results (*Normalised IQR*) - the interquartile range times 0.7413;

- (iv) the robust coefficient of variation, expressed as a percentage (*Robust CV*) - i.e. $100 \times \text{Normalised IQR} / \text{Median}$;
- (v) the minimum and maximum laboratory results; and
- (vi) the range (*Maximum - Minimum*).

Please see reference [1] for further details on these robust summary statistics.

(c) Ordered Z-Score Charts

On these charts each laboratory's z-score is shown, in order of magnitude, and is marked with its code number. From these each laboratory can readily compare its performance relative to the other laboratories.

These charts contain solid lines at +3 and -3, so the outliers are clearly identifiable as the laboratories whose "bar" extends beyond these "cutoff" lines. In some cases the y-axis of these charts has been limited, so very large or small (negative) z-scores appear to extend beyond the chart.

6. PTA & TECHNICAL ADVISER'S COMMENTS

Total Acidity

Outliers were reported for sample 1 by lab codes 9, 12 & 14. No outliers were reported for sample 2.

The outliers were all higher than the median for sample 1. This may be due to insufficient degassing of the sample prior to analysis.

Volatile Acidity

Lab codes 2a and 12 reported outliers for both sample 1 and sample 2. Lab code 7 reported an outlier for sample 1, while lab codes 14 & 15 reported outliers for sample 2.

Results for lab codes 2a and 12 are consistently higher than the median and may be due to a combination of standard solution accuracy and end point determination.

This may also apply to Lab code 7.

Lab codes 14 and 15 show random error which may be due to sample preparation.

Actual Alcohol

There were no outliers reported for sample 1, and only one outlier reported for sample 2 by lab code 1.

The random error associated with Lab code 1 may be attributed to sample preparation.

Total Sulfur Dioxide

Lab code 4 reported an outlier for sample 2, while there were no outliers reported for sample 1.

Lab code 3 results were consistently lower than the median typical of a systematic error. This could be due to a combination of sampling and standard solution accuracy.

Lab code 4 results display random error characteristics. This may be due to the condenser temperature being too high during the distillation process allowing carry over of the volatile acids

Reducing Sugars

There were no outliers reported for sample 2. Lab codes 2a and 3 each reported an outlier for sample 1.

The lower results for HPLC and enzymatic analyses are characteristic of these methods which measure the grape sugars glucose and fructose. The Lane Eynon and Rebelein methods measure the total reducing substances. The difference between enzymatic and HPLC results may be attributed to a combination of sample preparation and calibration of equipment.

Conclusion

Overall this round of testing was well performed and compared favourably with previous rounds. The majority of labs reported measurement uncertainty for the tests they conducted.

7. REFERENCES

[1] "Guide to Proficiency Testing" – February 2004 (this document is located on the PTA website at www.pta.asn.au under "Publications").

APPENDIX A

All Results

Summary Results

Z-Score Charts

Section 1 –
Sample 1 (White Wine)

A1

Total Acidity
0.1g/L as Tartaric Acid

Lab Code	Result 1	MU±	Result 2	MU±	Method	Averaged Results	Robust Z-Score
1	6.6	0.12	6.6	0.12		6.60	0.00
2a	6.6	±0.1	6.6	±0.1	Auto-titrator with pH 8.2 set end point	6.60	0.00
2b							
3							
4							
5a	6.5	0.18	6.5	0.18	Autotitrator	6.50	-1.48
5b							
5c							
6	6.67	0.12	6.66	0.12	Autotitrator	6.67	0.96
7	6.6					6.60	0.00
8	6.5	±0.11	6.5	±0.11	Potentiometric/Titration	6.50	-1.48
9	6.9	0.4	6.9		AOAC 947.05	6.90	4.44 §
11	6.7	0.1	6.7	0.1	Autotitrator	6.70	1.48
12	7.4	0.2	7.5	0.2	Based on AOAC 962.12 pH to 8.2	7.45	12.57 §
13	6.6	0.1				6.60	0.00
14	7.0	±0.15	6.9	±0.15	Autotitrator	6.95	5.17 §
15	6.5	±0.13	6.5	±0.13	Titration	6.50	-1.48
17	6.6	±0.14	6.6		Autotitration	6.60	0.00
18	6.6	±0.1			Titration	6.60	0.00

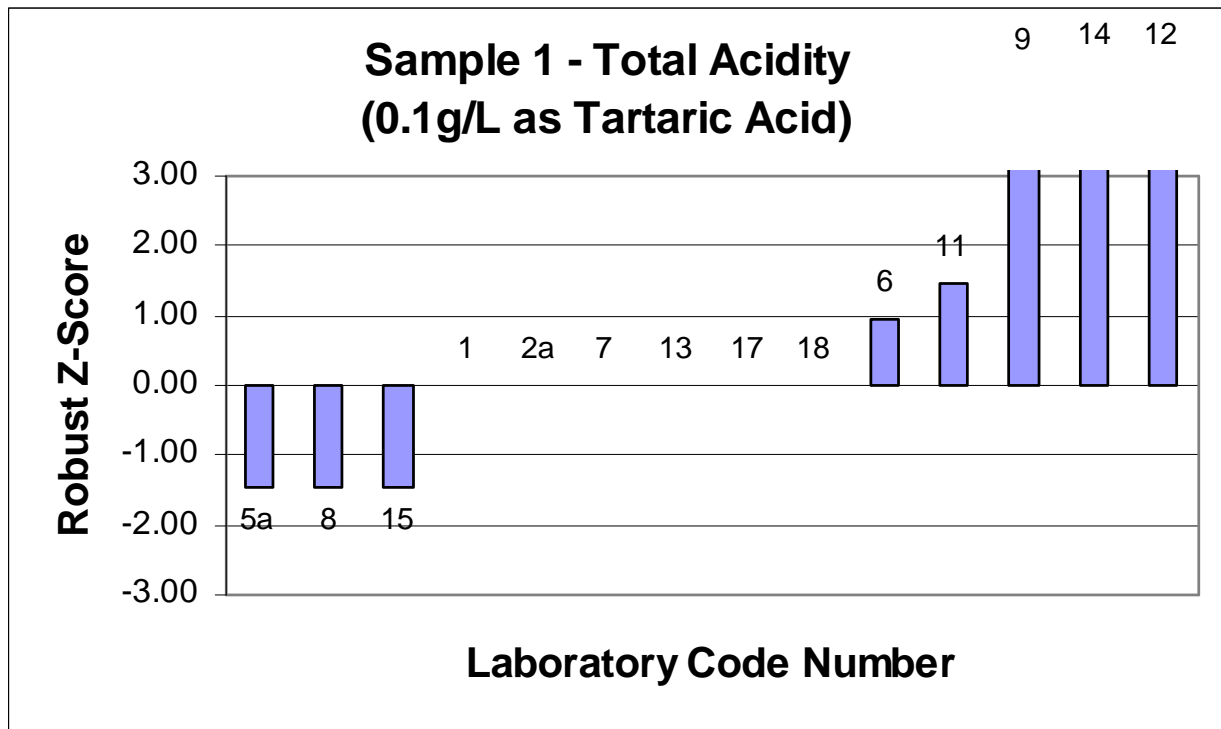
Notes:

MU = Measurement Uncertainty

§ denotes an outlier

Summary Statistics

No. results	14
Median	6.60
NormIQR	0.07
Robust CV	1.02%
Min	6.5
Max	7.45
Range	0.95



Volatile Acidity
0.05g/L as Acetic Acid

Lab Code	Result 1	MU \pm	Result 2	MU \pm	Method	Averaged Results	Robust Z-Score
1	0.35	0.065	0.35	0.065		0.35	0.97
2a	0.46	± 0.05	0.49	± 0.05	Steam distillation using modified cache still	0.48	3.67 §
2b							
3	0.35	± 0.2	0.35		Distillation/Titration	0.35	0.97
4							
5a	0.25	0.12	0.25	0.12	HPLC	0.25	-1.19
5b	0.30	0.06	0.30	0.06	Distillation	0.30	-0.11
5c							
6	0.30	0.03	0.31	0.03	Acetic - platereader	0.31	0.00
7	0.54					0.54	5.07 §
8	0.33	± 0.06	0.34	± 0.06	Steam Distillation/Titration	0.34	0.65
9							
11	0.30	0.1	0.30	0.1	Enzymatic	0.30	-0.11
12	0.50	0.05	0.50	0.05	AOAC 940.19	0.50	4.21 §
13	0.28	0.06			Enzymatic	0.28	-0.54
14	0.35	± 0.05	0.40	± 0.05	Acetic by enzyme	0.38	1.51
15	0.30	± 0.02	0.30	± 0.02	Boehringer Enzyme Kit	0.30	-0.11
17	0.30	± 0.03	0.30		Markham Still	0.30	-0.11
18	0.30	$\pm 10\%$			Enzymatic	0.30	-0.11

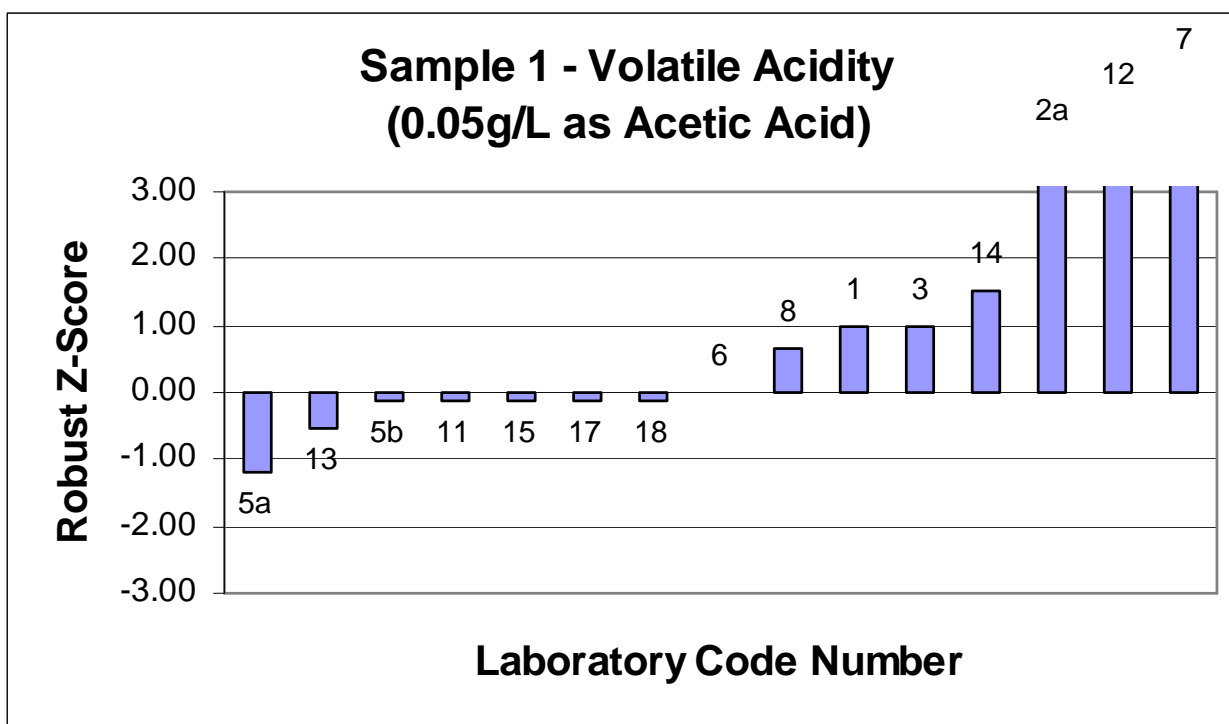
Notes:

MU = Measurement Uncertainty

§ denotes an outlier

Summary Statistics

No. results	15
Median	0.305
NormIQR	0.046
Robust CV	15.19%
Min	0.25
Max	0.54
Range	0.29



A5

Actual Alcohol
0.1%v/v

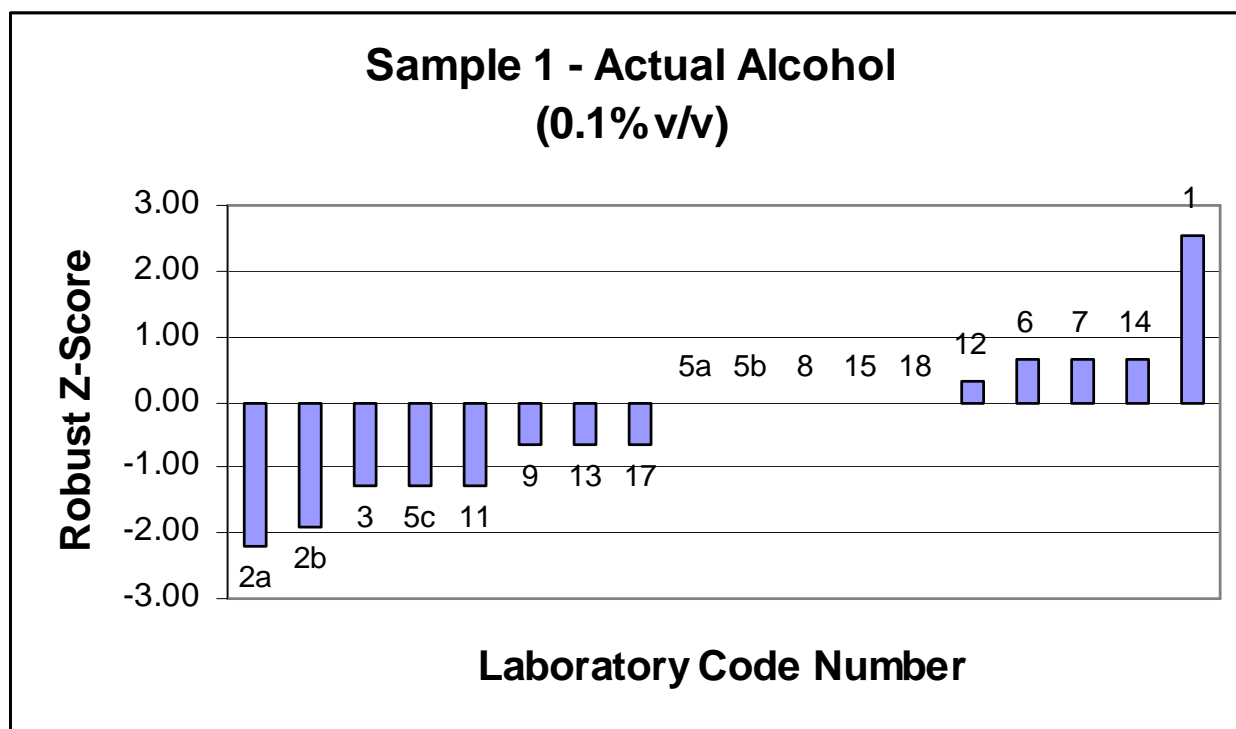
Lab Code	Result 1	MU±	Result 2	MU±	Method	Averaged Results	Robust Z-Score
1	13.5	0.046	13.5	0.046		13.50	2.54
2a	12.7	±0.20	12.8	±0.20	Distillation & hydrometry	12.75	-2.22
2b	12.8	±0.30	12.8	±0.30	NIR - Infralyser	12.80	-1.90
3	13.0	±0.4	12.8		Distillation/Pycometry	12.90	-1.27
4							
5a	13.1	0.12	13.1	0.12	NIR	13.10	0.00
5b	13.1	0.16	13.1	0.16	HPLC	13.10	0.00
5c	12.9	0.18	12.9	0.18	Distillation Picnometry	12.90	-1.27
6	13.2	0.1	13.2	0.1	Alcolyzer NIR	13.20	0.63
7	13.2					13.20	0.63
8	13.1	±0.03	13.1	±0.03	Distillation/Hydrometry	13.10	0.00
9	12.9	0.1	13.1		Inhouse method by GC	13.00	-0.63
11	12.9	0.1	12.9	0.1	NIR	12.90	-1.27
12	13.1	0.35	13.2	0.35	AOAC 983.13	13.15	0.32
13	13.0	0.2			Near Infra Red	13.00	-0.63
14	13.2	±0.1	13.2	±0.1	NIR	13.20	0.63
15	13.2	±0.5	13.0	±0.5	G.C.	13.10	0.00
17	13.0	±0.2	13.0		NIR - Alcolyser	13.00	-0.63
18	13.1	±0.1	13.1	±0.1	NIR	13.10	0.00

Notes:

MU = Measurement Uncertainty

Summary Results

No. results	18
Median	13.10
NormIQR	0.16
Robust CV	1.20%
Min	12.75
Max	13.5
Range	0.75



Total Sulfur Dioxide
1mg/L

Lab Code	Result 1	MU \pm	Result 2	MU \pm	Method	Averaged Results	Robust Z-Score
1	109	6.8	109	6.8		109.0	-1.60
2a	123	± 6	125	± 6	Rankine aspiration method	124.0	3.46 §
2b							
3	99	± 15	99		Monier-Williams Distillation/Titration	99.0	-4.97 §
4	121	25%	111	25%	Modified Monier-Williams	116.0	0.76
5a	105	9.0	105	9.0	Aspiration oxidation	105.0	-2.95
5b							
5c							
6	112	4	113	4	Aspiration	112.5	-0.42
7	118					118.0	1.43
8	114	± 6	112	± 6	Aspiration/Titration	113.0	-0.25
9	120	7	119		AOAC 990.28	119.5	1.94
11	116	5	116	5	Aspiration	116.0	0.76
12	114	10	124	10	Monier-Williams	119.0	1.77
13	113	2			Rankine Aspiration	113.0	-0.25
14	113	± 3	116	± 3	Rankine	114.5	0.25
15	112	± 11.2	113	± 11.3	Aspiration	112.5	-0.42
17	114	± 3	112		Aspiration	113.0	-0.25
18	115	± 6			Aspiration	115.0	0.42

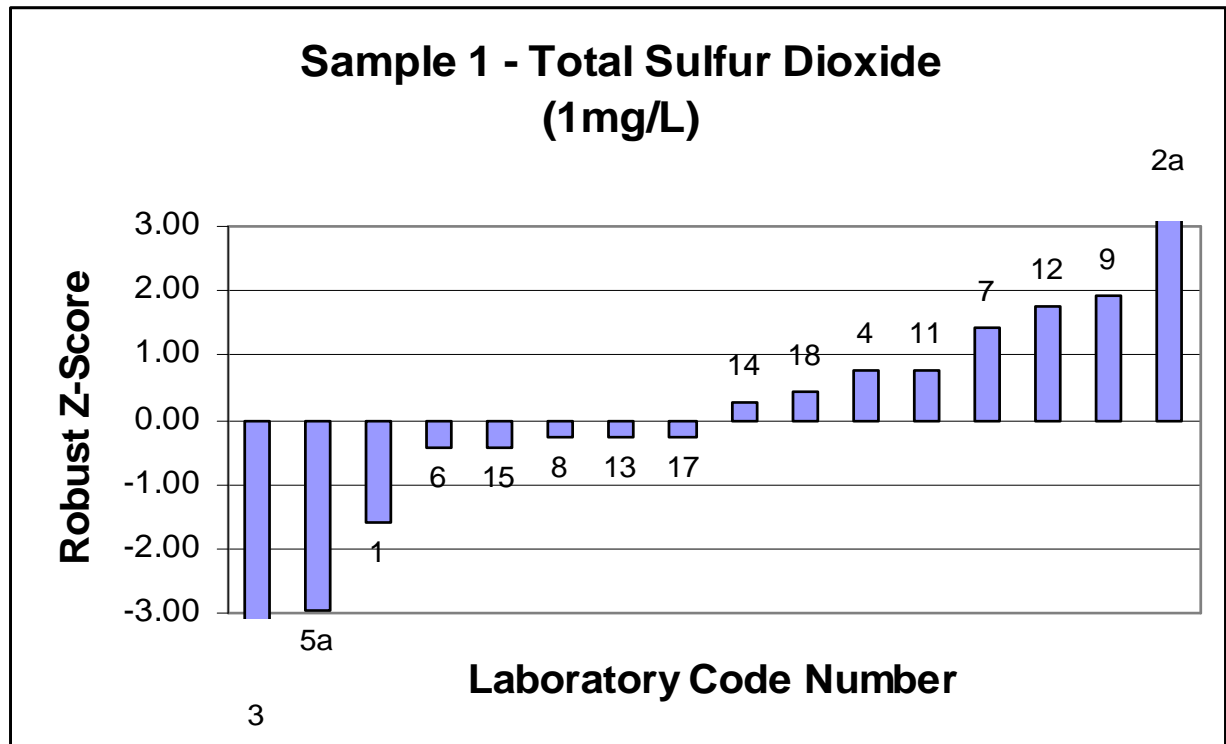
Notes:

MU = Measurement Uncertainty

§ denotes an outlier

Summary Statistics

No. results	16
Median	113.8
NormIQR	3.0
Robust CV	2.6%
Min	99
Max	124
Range	25



Reducing Sugars
0.1g/L

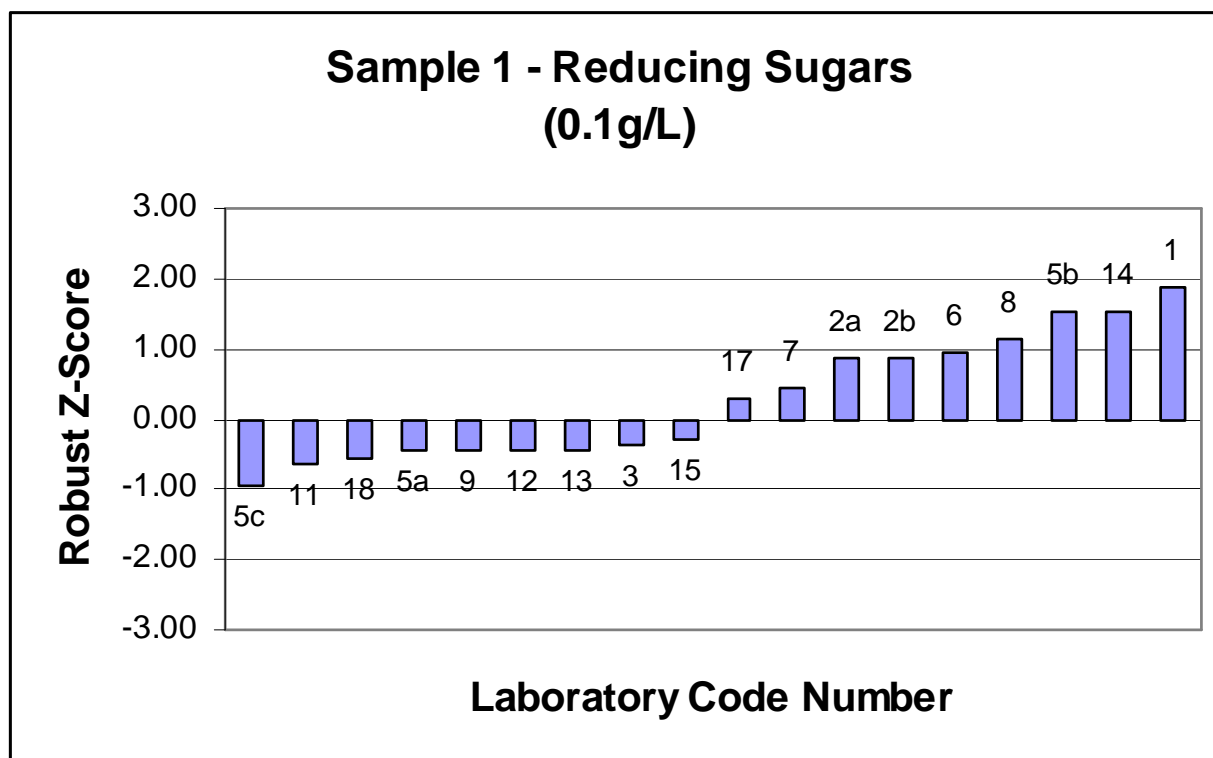
Lab Code	Result 1	MU \pm	Result 2	MU \pm	Method	Averaged Results	Robust Z-Score
1	4.4	0.15	4.4	0.15		4.4	1.87
2a	3.7	± 0.2	3.7	± 0.2	HPLC - Glucose & Fructose	3.7	0.86
2b	3.6	$\pm 3.0\%$	3.8	$\pm 3.0\%$	Rebeline	3.7	0.86
3	2.8	± 0.6	2.9		Aqueous Extraction Dilute with acetonitrile 25:75 Run HPLC/NH2 column/RI	2.9	-0.36
4							
5a	2.8	0.13	2.8	0.13	HPLC	2.8	-0.43
5b	4.1	0.6	4.2	0.6	Rebeline	4.2	1.51
5c	2.5	0.38	2.4	0.37	Enzymatic	2.5	-0.94
6	3.7	0.4	3.8	0.4	Lane/Enyon	3.8	0.94
7	3.4					3.4	0.43
8	3.9	± 0.3	3.9	± 0.3	Rebelein Method	3.9	1.15
9	2.8	0.3	2.8		Inhouse method by HPLC	2.8	-0.43
11	2.6	0.1	2.7	0.1	Enzymatic	2.7	-0.65
12	2.8	0.1	2.8	0.1	HPLC; glucose & fructose	2.8	-0.43
13	2.8	0.1			Enzymatic	2.8	-0.43
14	4.1	± 1.5	4.2	± 1.5	Lane & Eynon	4.2	1.51
15	2.9	± 0.26	2.9	± 0.26	Boehringer Enzyme Kit	2.9	-0.29
17	3.2	± 0.25	3.4		Lane & Eynon	3.3	0.29
18	2.7	$\pm 5\%$			Enzymatic	2.7	-0.58

Notes:

MU = Measurement Uncertainty

Summary Statistics

No. results	18
Median	3.10
NormIQR	0.69
Robust CV	22.42%
Min	2.45
Max	4.4
Range	1.95



Section 2 –
Sample 2 (Red Wine)

Total Acidity
0.1g/L as Tartaric Acid

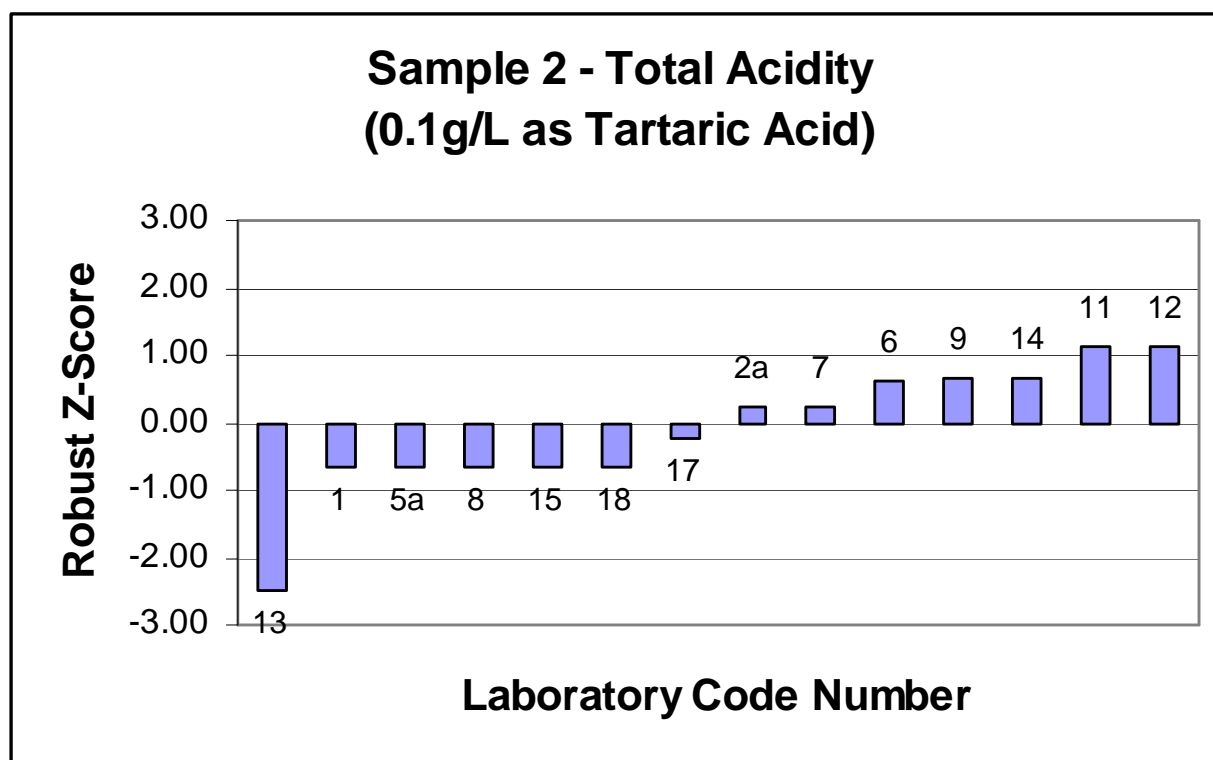
Lab Code	Result 1	MU±	Result 2	MU±	Method	Averaged Results	Robust Z-Score
1	6.2	0.12	6.2	0.12	Auto-titrator with pH 8.2 set end point	6.20	-0.68
2a	6.3	±0.1	6.3	±0.1		6.30	0.23
2b							
3							
4					Autotitrator		
5a	6.2	0.18	6.2	0.18		6.20	-0.68
5b							
5c							
6	6.35	0.12	6.34	0.12	Autotitrator	6.35	0.63
7	6.3					6.30	0.23
8	6.2	±0.11	6.2	±0.11	Potentiometric/Titration	6.20	-0.68
9	6.4		6.3		AOAC 947.05	6.35	0.68
11	6.4	0.1	6.4	0.1	Autotitrator	6.40	1.13
12	6.3	0.2	6.5	0.2	Based on AOAC 962.12	6.40	1.13
13	6.0	0.1			pH to 8.2	6.00	-2.49
14	6.3	±0.15	6.4	±0.15	Autotitrator	6.35	0.68
15	6.2	±0.12	6.2	±0.12	Titration	6.20	-0.68
17	6.2	±0.14	6.3		Autotitration	6.25	-0.23
18	6.2	±0.1			Titration	6.20	-0.68

Notes:

MU = Measurement Uncertainty

Summary Statistics

No. results	14
Median	6.28
NormIQR	0.11
Robust CV	1.76%
Min	6
Max	6.4
Range	0.4



Volatile Acidity
0.05g/L as Acetic Acid

Lab Code	Result 1	MU±	Result 2	MU±	Method	Averaged Results	Robust Z-Score
1	0.33	0.065	0.34	0.065		0.34	-2.70
2a	0.49	±0.05	0.50	±0.10	Steam distillation using modified cache	0.50	3.94 §
2b							
3	0.40	±0.2	0.40		Distillation/Titration	0.40	0.00
4							
5a	0.40	0.12	0.40	0.12	HPLC	0.40	0.00
5b	0.40	0.06	0.40	0.06	Distillation	0.40	0.00
5c							
6	0.41	0.03	0.43	0.03	Acetic - platereader	0.42	0.83
7	0.46					0.46	2.49
8	0.42	±0.06	0.42	±0.06	Steam Distillation/Titration	0.42	0.83
9							
11	0.40	0.1	0.40	0.1	Enzymatic	0.40	0.00
12	0.50	0.05	0.50	0.05	AOAC 940.19	0.50	4.15 §
13	0.41	0.06			Enzymatic	0.41	0.42
14	0.20	±0.05	0.25	±0.05	Acetic by enzyme	0.23	-7.26 §
15	0.30	±0.02	0.30	±0.02	Boehringer Enzyme Kit	0.30	-4.15 §
17	0.35	±0.03	0.40		Markham Still	0.38	-1.04
18	0.40	±10%			Enzymatic	0.40	0.00

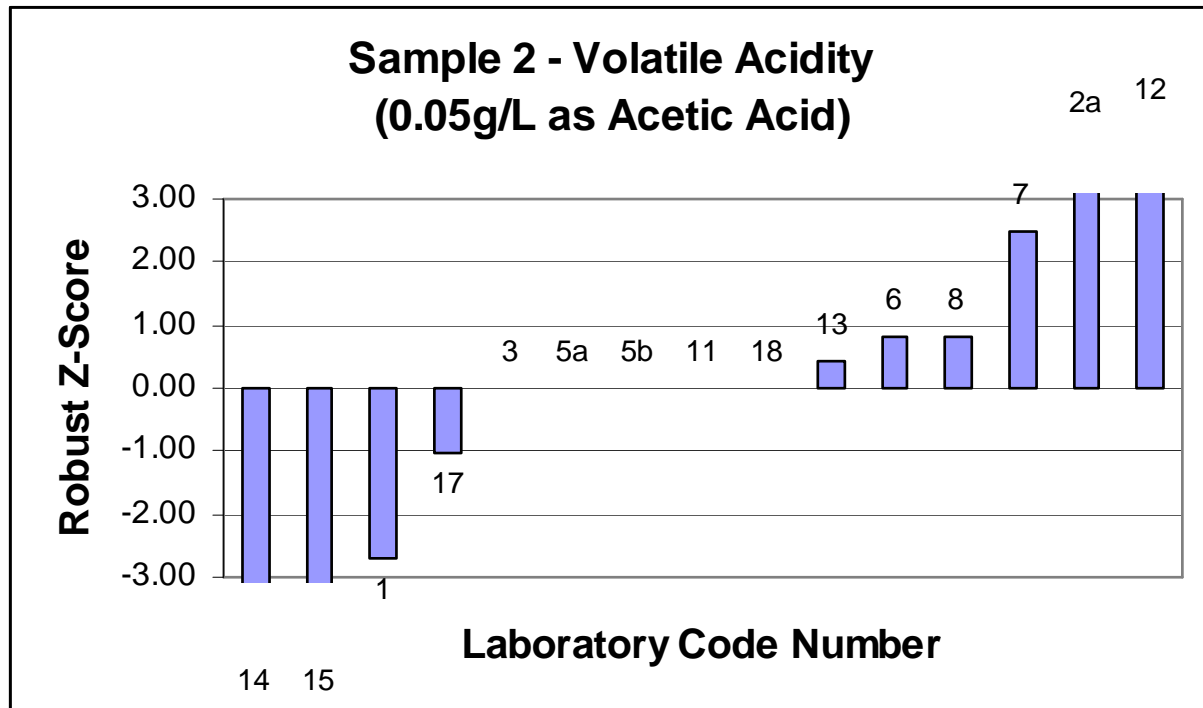
Notes:

MU = Measurement Uncertainty

§ denotes an outlier

Summary Statistics

No. results	15
Median	0.400
NormIQR	0.024
Robust CV	6.023%
Min	0.225
Max	0.5
Range	0.275



Actual Alcohol
0.1%v/v

Lab Code	Result 1	MU±	Result 2	MU±	Method	Averaged Results	Robust Z-Score
1	15.1	0.046	15.1	0.046		15.10	3.06 §
2a	14.4	±0.20	14.5	±0.20	Distillation & hydrometry	14.45	-1.62
2b	14.6	±0.30	14.6	±0.30	NIR - Infralyser	14.60	-0.54
3	14.6	±0.4	14.7		Distillation/Pycometry	14.65	-0.18
4							
5a	14.7	0.12	14.7	0.12	NIR	14.70	0.18
5b	14.8	0.16	14.8	0.16	HPLC	14.80	0.90
5c	14.5	0.18	14.5	0.18	Distillation Picnometry	14.50	-1.26
6	14.8	0.1	14.8	0.1	Alcolyzer NIR	14.80	0.90
7	14.6					14.60	-0.54
8	14.8	±0.03	14.7	±0.03	Distillation/Hydrometry	14.75	0.54
9	14.6		14.6		Inhouse method by GC	14.60	-0.54
11	14.6	0.1	14.6	0.1	NIR	14.60	-0.54
12	14.7	0.35	14.8	0.35	AOAC 983.13	14.75	0.54
13	14.5	0.2			Near Infra Red	14.50	-1.26
14	14.7	±0.1	14.7	±0.1	NIR	14.70	0.18
15	14.9	±0.6	14.9	±0.6	G.C.	14.90	1.62
17	14.6	±0.2	14.6		NIR - Alcolyser	14.60	-0.54
18	14.7	±0.1	14.9	±0.1	NIR	14.80	0.90

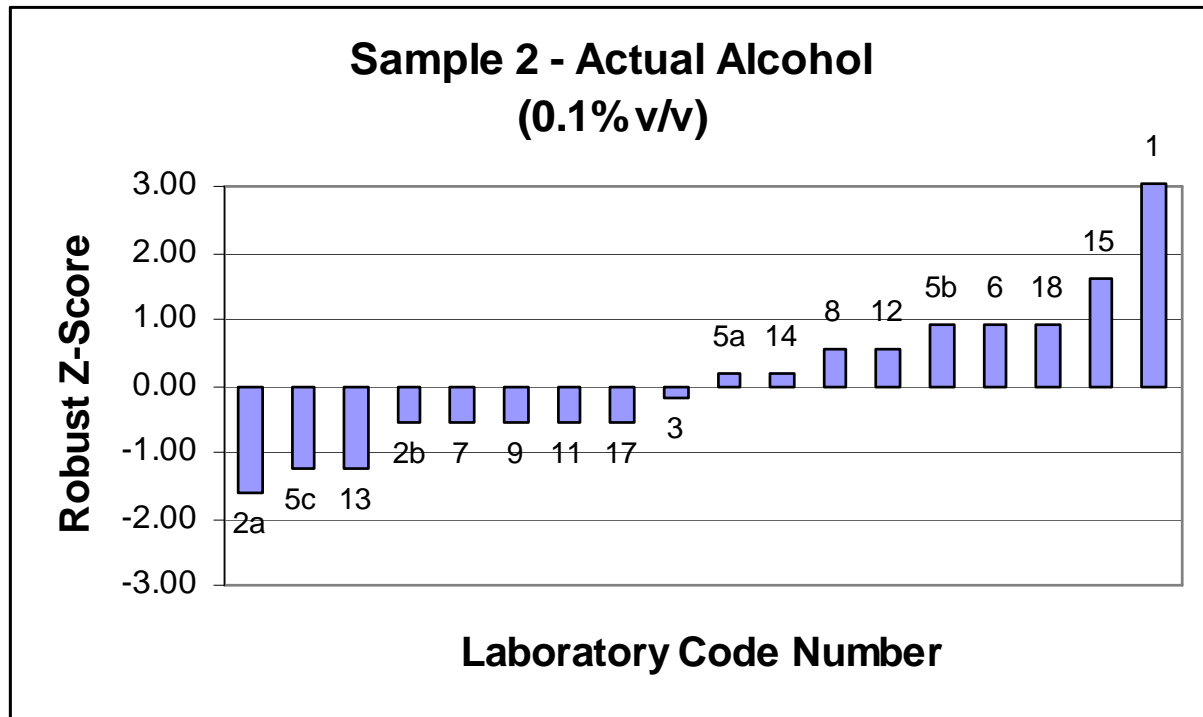
Notes:

MU = Measurement Uncertainty

§ denotes an outlier

Summary Statistics

No. results	18
Median	14.68
NormIQR	0.14
Robust CV	0.95%
Min	14.45
Max	15.1
Range	0.65



Total Sulfur Dioxide
1mg/L

Lab Code	Result 1	MU±	Result 2	MU±	Method	Averaged Results	Robust Z-Score
1	56	6.8	58	6.8		57.0	-1.29
2a	72	±6	74	±6	Rankine aspiration method	73.0	1.14
2b							
3	49	±15	49		Monier-Williams Distillation/Titration	49.0	-2.51
4	91	25%	89	25%	Modified Monier-Williams	90.0	3.72 §
5a	57	5.1	59	5.1	Aspiration oxidation	58.0	-1.14
5b							
5c							
6	69	4	68	4	Aspiration	68.5	0.46
7	68					68.0	0.38
8	67	±6	67	±6	Aspiration/Titration	67.0	0.23
9	77		79		AOAC 990.28	78.0	1.90
11	64	5	64	5	Aspiration	64.0	-0.23
12	73	10	89	10	Monier-Williams	81.0	2.36
13	60	2			Rankine Aspiration	60.0	-0.84
14	60	±3	62	±3	Rankine	61.0	-0.68
15	62	±6.2	62	±6.2	Aspiration	62.0	-0.53
17	63	±3	60		Aspiration	61.5	-0.61
18	67	±6			Aspiration	67.0	0.23

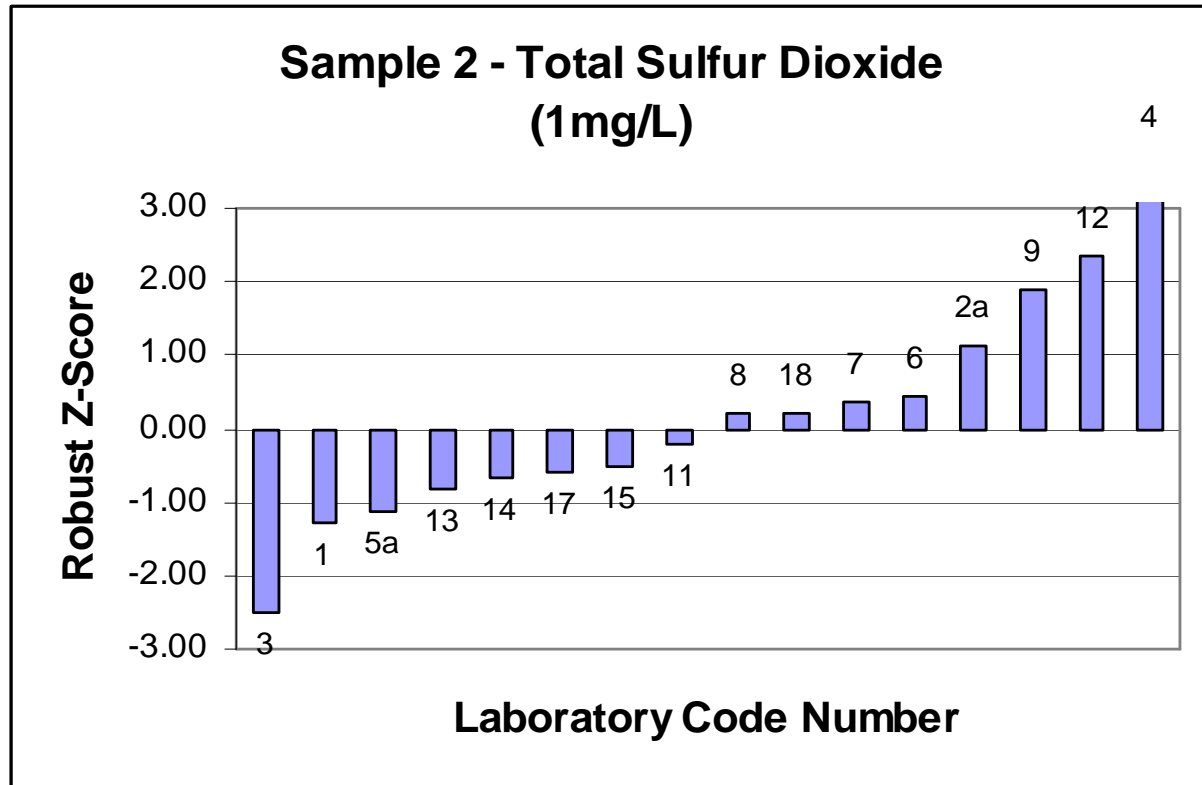
Notes:

MU = Measurement Uncertainty

§ denotes an outlier

Summary Statistics

No. results	16
Median	65.5
NormIQR	6.6
Robust CV	10.0%
Min	49
Max	90
Range	41



Reducing Sugars
0.1g/L

Lab Code	Result 1	MU±	Result 2	MU±	Method	Averaged Results	Robust Z-Score
1	9.0	0.15	8.9	0.15		8.95	1.36
2a	6.1	±0.2	6.1	±0.2	HPLC - Glucose & Fructose	6.10	-0.76
2b	8.4	±3.0%	8.5	±3.0%	Rebeline	8.45	0.99
3	7.1	±0.6	7.2		Aqueous Extraction Dilute with acetonitrile	7.15	0.02
4							
5a	7.0	0.32			HPLC	7.00	-0.09
5b	9.1	0.6	9.5	0.6	Rebeline	9.30	1.62
5c	6.6	0.71	6.4	0.69	Enzymatic	6.50	-0.47
6	8.6	0.4	8.5	0.4	Lane/Enyon	8.55	1.06
7	8.5					8.50	1.02
8	8.1	±0.3	8.2	±0.3	Rebelein Method	8.15	0.76
9	7.2		7.0		Inhouse method by HPLC	7.10	-0.02
11	6.4	0.1	6.4	0.1	Enzymatic	6.40	-0.54
12	7.0	0.1	7.1	0.1	HPLC; glucose & fructose	7.05	-0.06
13	6.3	0.1			Enzymatic	6.30	-0.61
14	7.8	±1.5	7.9	±1.5	Lane & Eynon	7.85	0.54
15	6.5	±0.59	6.5	±0.59	Boehringer Enzyme Kit	6.50	-0.47
17	8.0	±0.25	8.4		Lane & Eynon	8.20	0.80
18	6.8	±5%			Enzymatic	6.80	-0.24

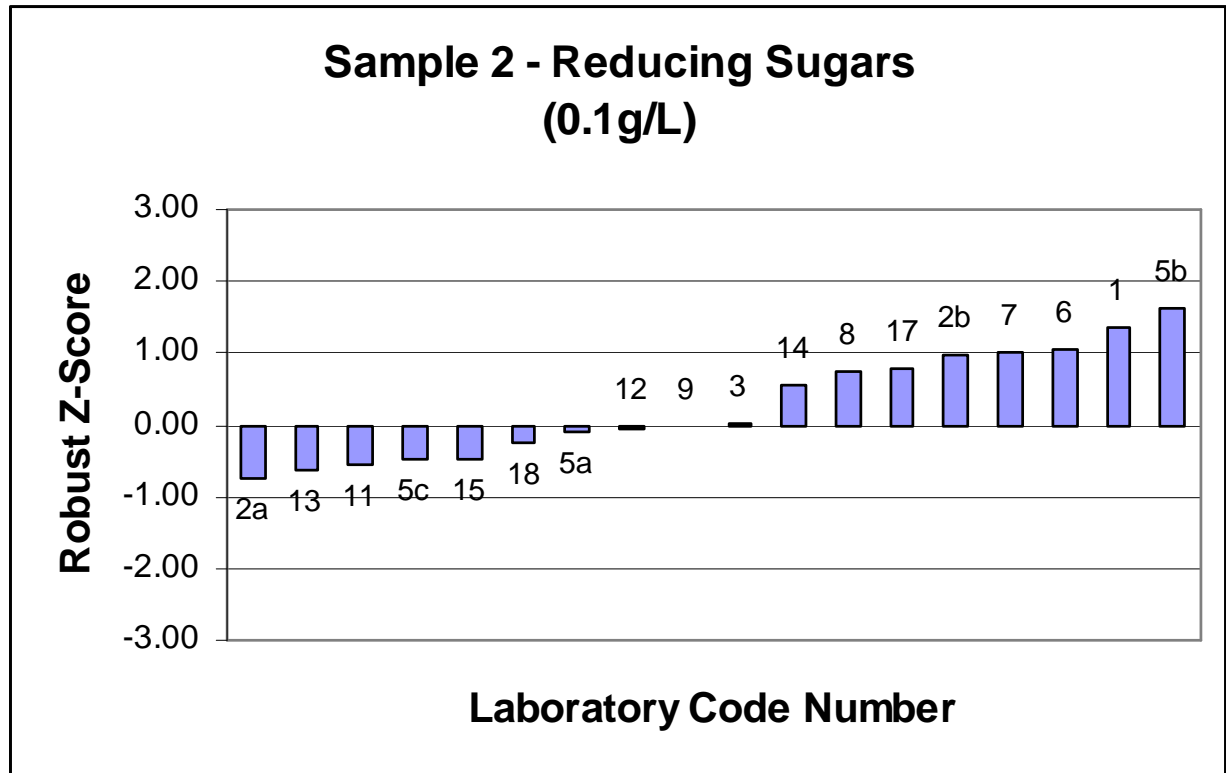
Notes:

MU = Measurement Uncertainty

§ denotes an outlier

Summary Statistics

No. results	18
Median	7.13
NormIQR	1.34
Robust CV	18.86%
Min	6.1
Max	9.3
Range	3.2



APPENDIX B

Homogeneity Testing

HOMOGENEITY TESTING

As mentioned in the introduction of this report, a number of samples were selected for preliminary testing analyses to monitor the homogeneity of the samples.

For this, 12 of each sample type were randomly selected and tested under repeatability conditions (i.e. same operator, same method etc). The results are given below. Statistical Analysis using an ANOVA indicate that there was no significant difference between the samples.

White Wine Sample

Sample	Alc	RS	TA	pH	VA	Free SO2	Total SO2
1	12.8	4.1	6.5	3.18	0.36	40	130
2	12.8	4.0	6.5	3.18	0.37	41	125
3	12.8	4.1	6.5	3.18	0.37	42	126
4	12.9	4.0	6.5	3.19	0.37	41	126
5	12.8	4.1	6.5	3.18	0.37	41	125
6	12.8	4.0	6.5	3.18	0.36	42	125
7	12.8	3.9	6.5	3.20	0.34	40	125
8	12.8	4.0	6.5	3.20	0.35	39	126
9	12.8	4.0	6.6	3.20	0.38	38	124
10	12.8	4.0	6.6	3.20	0.36	39	123
11	12.8	4.0	6.6	3.20	0.37	38	126
12	12.8	4.0	6.5	3.20	0.37	39	126

Red Wine Sample

No.	Alc	RS	TA	pH	VA	Free SO2	Total SO2
1	14.4	6.8	6.2	3.40	0.51	34	75
2	14.3	6.8	6.1	3.40	0.51	34	75
3	14.3	6.8	6.1	3.40	0.51	33	74
4	14.3	6.8	6.1	3.40	0.50	33	74
5	14.4	6.8	6.1	3.40	0.49	34	73
6	14.4	6.8	6.1	3.40	0.50	33	76
7	14.4	6.6	6.2	3.42	0.50	31	70
8	14.4	6.7	6.1	3.43	0.49	31	72
9	14.4	6.7	6.2	3.42	0.50	32	73
10	14.4	6.7	6.1	3.43	0.49	34	76
11	14.4	6.7	6.2	3.43	0.50	32	76
12	14.4	6.7	6.2	3.43	0.48	32	74

APPENDIX C

Instructions to Participants

and

Results Sheet

**NATIONAL ASSOCIATION OF TESTING AUTHORITIES, AUSTRALIA
WINE PROFICIENCY PROGRAM – NOVEMBER 2005
ROUND 14
INSTRUCTIONS TO PARTICIPANTS**

Please read instructions carefully BEFORE commencing testing.

To ensure that the results of this program can be analysed properly participants are asked to note carefully the following:

1. For this program each participant is provided with two samples, one of white wine and one of red wine labelled sample 1 and sample 2.
2. The following tests are to be conducted in duplicate on both samples:

Total Acidity
Volatile Acidity
Actual Alcohol
Total Sulfur Dioxide
Reducing Sugars

NATA accredited laboratories should perform these tests by each of their accredited methods. They may also submit results for test(s) or methods(s) which they are not accredited for. Non-NATA laboratories should conduct the tests by their usual methods.

All results are to be reported on the attached Results Sheet. Please ensure that the method used is entered on the Results Sheet for each set of analyses. If the method is not a standard method, please provide a precise description.

3. For Total Acidity, participants should titrate to end point pH 8.2. It is recognised that some methods for total acidity (e.g. EEC Regulation 000/90; Method 13, page 81) prescribe an end point at pH 7.0. However, for the purpose of this program it is necessary that all values be obtained at the same end point, namely pH 8.2.
4. Laboratories are also requested to calculate and report an estimate of uncertainty of measurement for each reported measurement result. All estimates of uncertainty of measurement must be given as a 95% confidence interval (coverage factor $k \approx 2$)
5. All tests may be conducted as soon as the samples are received. Results should be forwarded to:

Ms Kate Wiggins
Scientific Officer
Proficiency Testing
National Association of Testing Authorities, Australia
7 Leeds Street
RHODES NSW 2138
ph: (02) 9736 8222 fax: (02) 9743 6664 or 9743 5311
e-mail: kwiggins@nata.asn.au
please no later than **25 November 2005**.

6. For this program your laboratory has been allocated a code number which will allow for confidential treatment of your results in any reports prepared for this round of testing.

Your code number for this round of testing is

«Code_»



**NATIONAL ASSOCIATION OF TESTING AUTHORITIES, AUSTRALIA
WINE PROFICIENCY PROGRAM ROUND 14– NOVEMBER 2005
RESULTS SHEET**

Laboratory Code

«Code_»

TEST	REPORT TO NEAREST	SAMPLE 1		SAMPLE 2		METHOD
		Result	Measurement Uncertainty	Result	Measurement Uncertainty	
Total Acidity	0.1 g/L as Tartaric Acid					
Total Acidity	0.1 g/L as Tartaric Acid					
Volatile Acidity	0.05 g/L as Acetic Acid					
Volatile Acidity	0.05 g/L as Acetic Acid					
Actual Alcohol	0.1%v/v					
Actual Alcohol	0.1%v/v					
Total Sulfur Dioxide	1mg/l					
Total Sulfur Dioxide	1mg/l					
Reducing Sugars	0.1g/l					
Reducing Sugars	0.1g/l					

Date(s) of Tests(s)

Signature

NATA WINE PROFICIENCY TESTING PROGRAM – ROUND 14

MEASUREMENT UNCERTAINTY COMMENTS



Laboratory Code

«Code_»

Please use the space below to briefly describe the methods used to determine the measurement uncertainty for each reported measurement results.

Please return results no later than **25 November 2005** to:

Ms Kate Wiggins
Scientific Officer, Proficiency Testing
National Association of Testing Authorities, Australia
7 Leeds Street
RHODES NSW 2138

ph: (02) 9736 8222 fax: (02) 9743 6664 or 9743 5311
e-mail: kwiggins@nata.asn.au