



Fapas® – Food Chemistry Proficiency Test Report 04438

Aflatoxins in Animal Feed (Cereal Based)

April-May 2022

PARTICIPANT LABORATORY NUMBER

Participants can log in to Fapas[®] SecureWeb at any time to obtain their laboratory number for this proficiency test.

Laboratory numbers are displayed in SecureWeb next to the download link for this report.

REPORT INTEGRITY

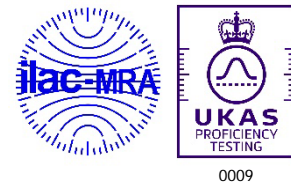
Fapas[®] reports are distributed as digitally signed Adobe[®] PDF files. When these files are opened with Adobe[®] Reader v9 or later, a blue ribbon and information bar indicates that the certificate has been validated. This confirms that the author of the report is Fapas[®] and that the document has not been altered since it was signed [1, 2].

The integrity of hard copies of Fapas[®] reports cannot be assured in this way, i.e. printed copies are not controlled. A watermark stating this appears on every page when a Fapas[®] report is printed.

End users of Fapas[®] reports should ensure that either the PDF file they are viewing displays a valid Fapas[®] digital signature or that the content of their hard copy exactly matches the content of a PDF file that displays a valid Fapas[®] digital signature.

QUALITY SYSTEMS

Fapas[®] – Food Chemistry is accredited by UKAS as complying with the requirements of ISO/IEC 17043:2010 [3]. This accreditation is recognised globally under the ILAC Mutual Recognition Agreement [4].



This report is the output of a Management System that is certified by LRQA to ISO 9001:2015 [5, 6].

Fera hereby excludes all liability for any claim, loss, demands or damages of any kind whatsoever (whether such claims, loss, demands or damages were foreseeable, known or otherwise) arising out of or in connection with the preparation of any technical or scientific report, including without limitation, indirect or consequential loss or damage; loss of actual or anticipated profits (including loss of profits on contracts); loss of revenue; loss of business; loss of opportunity; loss of anticipated savings; loss of goodwill; loss of reputation; loss or damage to or corruption of data; loss of use of money or otherwise, and whether or not advised of the possibility of such claim, loss demand or damages and whether arising in tort (including negligence), contract or otherwise. This statement does not affect your statutory rights.

Nothing in this disclaimer excludes or limits Fera liability for: (a) death or personal injury caused by Fera negligence (or that of its employees, agents or directors); or (b) the tort of deceit; [or (c) any breach of the obligations implied by Sale of Goods Act 1979 or Supply of Goods and Services Act 1982 (including those relating to the title, fitness for purpose and satisfactory quality of goods);] or (d) any liability which may not be limited or excluded by law or (e) fraud or fraudulent misrepresentation.

The parties agree that any matters are governed by English law and irrevocably submit to the non-exclusive jurisdiction of the English courts.

© Copyright Fera Science Ltd (Fera) 2022. All rights reserved.

SUMMARY

1. The test materials for Fapas[®] – Food Chemistry proficiency test 04438 were dispatched in April 2022. Each participant received an animal feed (cereal based) test material to be analysed for aflatoxin B₁, aflatoxin B₂, aflatoxin G₁, aflatoxin G₂, and aflatoxins (total).
2. An assigned value (x_a) was determined for each analyte and in conjunction with the standard deviation for proficiency (σ_p) was used to calculate a z-score for each result.
3. Results for this proficiency test are summarised as follows:

analyte	assigned value, x_a $\mu\text{g/kg}$	number of scores, $ z \leq 2$	total number of scores	% $ z \leq 2$
Aflatoxin B ₁	7.80	39	39	100
Aflatoxin B ₂	5.41	31	31	100
Aflatoxin G ₁	3.78	30	32	94
Aflatoxin G ₂	2.67	26	31	84
Aflatoxins (total)	19.1	36	38	95

CONTENTS

1. INTRODUCTION	5
1.1. Proficiency Testing	5
2. TEST MATERIAL	5
2.1. Preparation	5
2.2. Homogeneity	5
2.3. Dispatch	5
3. RESULTS	5
4. STATISTICAL EVALUATION OF RESULTS	6
4.1. Calculation of the Assigned Value, x_a	6
4.2. Standard Deviation for Proficiency, σ_p	7
4.3. Individual z-Scores	7
5. INTERPRETATION OF SCORES	7
6. REFERENCES	8
TABLES	
Table 1: Results and z-Scores	9
Table 2: Participants' Comments	12
Table 3: Assigned Values and Standard Deviations for Proficiency	12
Table 4: Number and Percentage of z-Scores where $ z \leq 2$	12
FIGURES	
Figure 1: z-Scores for Aflatoxin B ₁	13
Figure 2: z-Scores for Aflatoxin B ₂	14
Figure 3: z-Scores for Aflatoxin G ₁	15
Figure 4: z-Scores for Aflatoxin G ₂	16
Figure 5: z-Scores for Aflatoxins (total)	17
APPENDICES	
APPENDIX I: Analytical Methods Used by Participants	18
APPENDIX II: Fapas [®] SecureWeb, Protocol and Contact Details	24

1. INTRODUCTION

1.1. Proficiency Testing

Proficiency testing aims to provide an independent assessment of the competence of participating laboratories. Together with the use of validated methods, proficiency testing is an essential element of laboratory quality assurance.

Further details of the Fapas[®] – Food Chemistry proficiency testing scheme are available in our protocols [7, 8].

2. TEST MATERIAL

2.1. Preparation

Preparation of the samples for this proficiency test was sub-contracted to a laboratory meeting the quality requirements of the scheme's accreditation [3].

The test materials were prepared from a commercially available pig feed.

All analytes were spiked into the test material.

Samples were stored at -20°C until dispatch.

2.2. Homogeneity

To test for homogeneity, randomly selected test materials were analysed in duplicate. Testing was sub-contracted to a laboratory meeting the quality requirements of the scheme's accreditation [3].

These data showed sufficient homogeneity and were not included in the subsequent calculation of the assigned values.

2.3. Dispatch

The start date was 01 April 2022. Test materials were sent to 51 participants.

3. RESULTS

The instructions for reporting results were as follows:

Determine the level of analyte(s) present in the test material as follows:

analyte	units	comment
aflatoxin B ₁	µg/kg	Determine the level of each analyte present in the test material, as received, corrected for recovery.
aflatoxin B ₂	µg/kg	
aflatoxin G ₁	µg/kg	Please state your % recovery when submitting your results.
aflatoxin G ₂	µg/kg	

analyte	units	comment
aflatoxins (total)	µg/kg	If a different correction factor to a % recovery is used, please make a note of this in the comments section when submitting your results.

PLEASE NOTE: It is important that you report the results in this way so that we can include as many results as possible in the statistical analysis.

Results were submitted by 45 participants (88%) before the closing date for this test, 13 May 2022.

Each participant was given a laboratory number, assigned in order of receipt of results. The reported analyte concentrations are given in Table 1.

Participants' comments are given in Table 2.

The analytical methods used by each participant are summarised in APPENDIX I.

4. STATISTICAL EVALUATION OF RESULTS

The results submitted by participants were statistically analysed in order to provide an assigned value for each analyte. The assigned values were then used in combination with the standard deviation for proficiency, σ_p , to calculate a z-score [9] for each result. The procedure is detailed in the relevant protocols [7, 8].

Further background on the procedure followed can be found in the IUPAC International Harmonised Protocol for the Proficiency Testing of Analytical Chemistry Laboratories [10].

4.1. Calculation of the Assigned Value, x_a

The assigned value, x_a , for each analyte was derived from the consensus of the results submitted by participants.

The procedure used to derive this consensus involved:

- i) exclusion, if present, of any non numerical results i.e. qualitative or semi-quantitative results,
- ii) exclusion, if present, of any results that were approximately 10, 100 or 1000 × greater or smaller than the majority of submitted results (as these were considered to be reporting errors),
- iii) exclusion of results from participants not quoting a percentage recovery, EXCEPT for total aflatoxins, where participants submitted results that were the sum of their recovery corrected individual aflatoxins.

For all analytes, this procedure was straightforward and the robust mean was chosen as the assigned value.

The assigned values for all analytes are shown in Table 3.

4.2. Standard Deviation for Proficiency, σ_p

The standard deviation for proficiency, σ_p , was set at a value that reflects best practice for the analyses in question.

For all analytes, σ_p was derived from the appropriate form of the Horwitz equation [11].

The values for σ_p used to calculate z-scores from the reported results of this test are given in Table 3.

4.3. Individual z-Scores

Participants' z-scores were calculated as:

$$z = \frac{(x - x_a)}{\sigma_p}$$

where x = the participant's reported result,

x_a = the assigned value, see Table 3,

and σ_p = the standard deviation for proficiency, see Table 3.

Participants' z-scores for all analytes are given in Table 1 and shown as histograms in Figures 1–5. It is possible for the z-scores published in this report to differ slightly from the z-score that can be calculated using the formula given above. These differences arise from the necessary rounding of the actual assigned values and standard deviations for proficiency prior to their publication in Table 3.

The number and percentage of z-scores in the range $-2 \leq z \leq 2$ for all analytes are given in Table 4.

5. INTERPRETATION OF SCORES

In normal circumstances, over time, about 95% of z-scores will lie in the range $-2 \leq z \leq 2$. Occasional scores in the range $2 < |z| < 3$ are to be expected, at a rate of 1 in 20. Whether or not such scores are of importance can only be decided by considering them in the context of the other scores obtained by that laboratory.

Scores where $|z| > 3$ are to be expected at a rate of about 1 in 300. Given this rarity, such z-scores very strongly indicate that the result is not fit-for-purpose and almost certainly requires investigation.

The consideration of a set or sequence of z-scores over time provides more useful information than a single z-score. Examples of suitable methods of comparison are provided in the IUPAC International Harmonised Protocol for the Proficiency Testing of Analytical Chemistry Laboratories [10].

6. REFERENCES

- 1 Adobe Approved Trust List,
<https://helpx.adobe.com/acrobat/kb/approved-trust-list2.html#Whatisit>
accessed 24/03/2022.
- 2 GlobalSign AATL Document Signing FAQs,
<https://support.globalsign.com/aatl-document/aatl-document-signing-faqs>
accessed 24/03/2022.
- 3 ISO/IEC 17043:2010, Conformity assessment – General requirements for proficiency testing.
- 4 The ILAC Mutual Recognition Arrangement,
<https://ilac.org/ilac-mra-and-signatories/>
accessed 24/03/2022.
- 5 Fera Science Ltd, Standards & Accreditations,
<https://www.fera.co.uk/about-us/standards-and-accreditation>
accessed 24/03/2022.
- 6 Lloyd's Register, Learn about ISO 9001 Quality Management Systems (QMS),
<https://www.lr.org/en-gb/iso-9001/>
accessed 24/03/2022.
- 7 Fapas[®], 2021, Protocol for Proficiency Testing Schemes, Version 7, January 2021,
Part 1 – Common Principles.
- 8 Fapas[®], 2017, Protocol for Proficiency Testing Schemes, Version 5, April 2017,
Part 2 – Fapas[®] Food Chemistry scheme (FAPAS).
- 9 AMC Tech Brief No. 74, z-Scores and other scores in chemical proficiency testing – their meanings, and some common misconceptions, *Anal. Methods*, 2016, **8**, 5553.
- 10 Thompson, M., Ellison, S.L.R. and Wood, R., 2006, The International Harmonised Protocol for the Proficiency Testing of Analytical Chemistry Laboratories, *Pure Appl. Chem.*, **78**, No. 1, 145–196.
- 11 Thompson, M., 2000, Recent trends in inter-laboratory precision at ppb and sub-ppb concentrations in relation to fitness for purpose criteria in proficiency testing, *Analyst*, **125**, 385-386.

Table 1: Results and z-Scores

laboratory number	analyte														
	Aflatoxin B ₁ assigned value: 7.80 µg/kg			Aflatoxin B ₂ assigned value: 5.41 µg/kg			Aflatoxin G ₁ assigned value: 3.78 µg/kg			Aflatoxin G ₂ assigned value: 2.67 µg/kg			Aflatoxins (total) assigned value: 19.1 µg/kg		
	result	recovery %	z-score	result	recovery %	z-score	result	recovery %	z-score	result	recovery %	z-score	result	recovery %	z-score
001													8.25		-2.6
002	8.2	91	0.2	6.1	93	0.6	3.9	88	0.2	2.8	92	0.2	21.0	91	0.5
003	9.04	82.1	0.7	6.48	97.6	0.9	3.71	99.4	-0.1	3.97	84.0	2.2	23.2		1.0
004	8.27	98.6	0.3	6.09	92.5	0.6	3.92	92.2	0.2	2.76	96.7	0.2	21.04		0.5
005	6.7	78	-0.6	4.9	80	-0.4	3.4	82	-0.5	2.6	76	-0.1	17.6		-0.4
006	8.336		0.3	4.892		-0.4	4.050		0.3	1.216		-2.5	20.35		0.3
007	7.22	90	-0.3												
008	11.10	97	1.9	6.65	93	1.0	5.49	94	2.1	2.33	0.49	-0.6	25.57	4.83	1.5
009	8.17	105	0.2	6.17	95	0.6	3.99	106	0.3	2.67	72	0.0	21.00	103	0.5
010	8.58	100	0.5	5.91	100	0.4	4.13	100	0.4	3.71	74.9	1.8	22.33		0.8
011	7.77	86.58	0.0	5.94	90.55	0.4	3.42	84.03	-0.4	2.55	82.26	-0.2	17.67	95.50	-0.3
012	7.25	82.23	-0.3	5.13	93.34	-0.2	3.75	85.33	0.0	2.68	80.62	0.0	18.81	85.38	-0.1
013	7.71		0.0										17.81		-0.3
014													15		-1.0
015	7.793		0.0	4.944		-0.4	3.834		0.1	4.086		2.4	20.657		0.4

z-scores outside $|z| > 2$ are shown in **bold**, see Section 5

Table 1 (continued): Results and z-Scores

laboratory number	analyte														
	Aflatoxin B ₁ assigned value: 7.80 µg/kg			Aflatoxin B ₂ assigned value: 5.41 µg/kg			Aflatoxin G ₁ assigned value: 3.78 µg/kg			Aflatoxin G ₂ assigned value: 2.67 µg/kg			Aflatoxins (total) assigned value: 19.1 µg/kg		
	result	recovery %	z-score	result	recovery %	z-score	result	recovery %	z-score	result	recovery %	z-score	result	recovery %	z-score
016	5.8082	-	-1.2	4.6726	-	-0.6	3.2620	-	-0.6	2.2934	-	-0.6	16.2436	-	-0.7
017	8.7	101	0.5	not determin ed			not determin ed			not determin ed			not determin ed		
018	7.54	95.32	-0.1	5.06	97.65	-0.3	3.32	88.65	-0.5	2.51	78.00	-0.3	18.43		-0.2
019	7.2	84	-0.3												
020	7.1	99	-0.4	5.0	99	-0.3	3.6	96	-0.2	2.4	98	-0.5	18.0		-0.3
021	8.23	113.7	0.3	5.12	119.6	-0.2	3.98	143.4	0.2	2.72	149.2	0.1			
022	6.25	87	-0.9	3.06	84	-2.0	2.65	89	-1.4	1.28	93	-2.4	13.24	-	-1.4
023	4.42	97	-2.0	4.80	107	-0.5	3.81	101	0.0	2.88	94	0.4	15.91	-	-0.8
024	5.98	91	-1.1	4.12	103	-1.1	2.84	88	-1.1	2.07	100	-1.0	15.01	95.5	-1.0
025	8.4610	100	0.4	5.2177	100	-0.2	2.9442	100	-1.0	2.1764	100	-0.8	18.7994	100	-0.1
026	6.97	100	-0.5	4.79	100	-0.5	3.17	100	-0.7	1.98	100	-1.2	16.90	100	-0.5
027	6.968	51.70	-0.5	5.092	66.90	-0.3	3.621	99.37	-0.2	2.509	113.46	-0.3	18.190	82.86	-0.2
028	9.68	95	1.1	6.45	95	0.9	4.37	95	0.7	2.98	95	0.5			
029													18		-0.3
030	7.5		-0.2	4.8		-0.5	3.2		-0.7	2.2		-0.8	17.7		-0.3

z-scores outside $|z| > 2$ are shown in **bold**, see Section 5

Table 1 (continued): Results and z-Scores

laboratory number	analyte														
	Aflatoxin B ₁ assigned value: 7.80 µg/kg			Aflatoxin B ₂ assigned value: 5.41 µg/kg			Aflatoxin G ₁ assigned value: 3.78 µg/kg			Aflatoxin G ₂ assigned value: 2.67 µg/kg			Aflatoxins (total) assigned value: 19.1 µg/kg		
	result	recovery %	z-score	result	recovery %	z-score	result	recovery %	z-score	result	recovery %	z-score	result	recovery %	z-score
031	6.73	75.35	-0.6	5.01	87.2	-0.3	3.17	92.9	-0.7	1.91	101.7	-1.3	16.83		-0.5
032	7.75	96	0.0										16.78	97	-0.5
033	8.05	100	0.1										17.12		-0.5
034	7.6	86.4	-0.1	4.7	97.5	-0.6	4.5	99.9	0.9	2.6	97.4	-0.1	19.4	95.3	0.1
035													15.46		-0.9
036	9.30	95.9	0.9	6.48	94.4	0.9	4.36	96.4	0.7	3.37	84.3	1.2	23.51		1.1
037	8.22	99.3	0.2	6.16	101.3	0.6	4.66	96.0	1.1	3.3	95.7	1.1	22.34		0.8
038	9.76	106.5	1.1												
039	7.10	70.32	-0.4	4.18	70.02	-1.0	3.68	72.74	-0.1	1.62	72.79	-1.8	16.58		-0.6
040	8.086	91.9	0.2	5.608	94.68	0.2	5.376	99.96	1.9	3.286	102.42	1.1	22.356	97.24	0.8
041													15.70	97.02	-0.8
042													0.116		-4.5
043	6.95	-	-0.5	5.99	-	0.5	3.89	-	0.1	2.81	-	0.2	19.6	-	0.1
044	7.39	104.33	-0.2	5.29	95.30	-0.1	3.63	102.61	-0.2	4.16	100.33	2.5	20.47	100.64	0.3
045	9.462		1.0				6.160		2.9						

z-scores outside $|z| > 2$ are shown in **bold**, see Section 5

Table 2: Participants' Comments

laboratory number	comments
011	Aflatoxin (B1,B2,G1,G2) analysis by HPLC-FLD Aflatoxins(total) analysis by Fluorometer
016	In-house method based on AOAC (2019) 991.31 and 990.33.
026	LOQ for AFB2 and AFG2 is 5 ug/kg
027	Aflatoxins (total) is the sum of the single aflatoxins which are already corrected by their own recoveries. Given recovery for aflatoxins (total) here is only the average of the recoveries of the single aflatoxins.
035	The average result, were reported by analysis of three diferent analysts in three diferent days.

comments are as submitted by participants but some may have been edited to maintain participant anonymity

Table 3: Assigned Values and Standard Deviations for Proficiency

analyte	data points, n	assigned value, x_a $\mu\text{g/kg}$	uncertainty, u	standard deviation for proficiency, σ_p	
Aflatoxin B ₁	32	7.80	0.19	Horwitz [11]	1.71
Aflatoxin B ₂	26	5.41	0.17	Horwitz [11]	1.19
Aflatoxin G ₁	26	3.78	0.12	Horwitz [11]	0.831
Aflatoxin G ₂	26	2.67	0.13	Horwitz [11]	0.587
Aflatoxins (total)	26	19.1	0.6	Horwitz [11]	4.20

Table 4: Number and Percentage of z-Scores where $|z| \leq 2$

analyte	number of scores where $ z \leq 2$	total number of scores	% $ z \leq 2$
Aflatoxin B ₁	39	39	100
Aflatoxin B ₂	31	31	100
Aflatoxin G ₁	30	32	94
Aflatoxin G ₂	26	31	84
Aflatoxins (total)	36	38	95

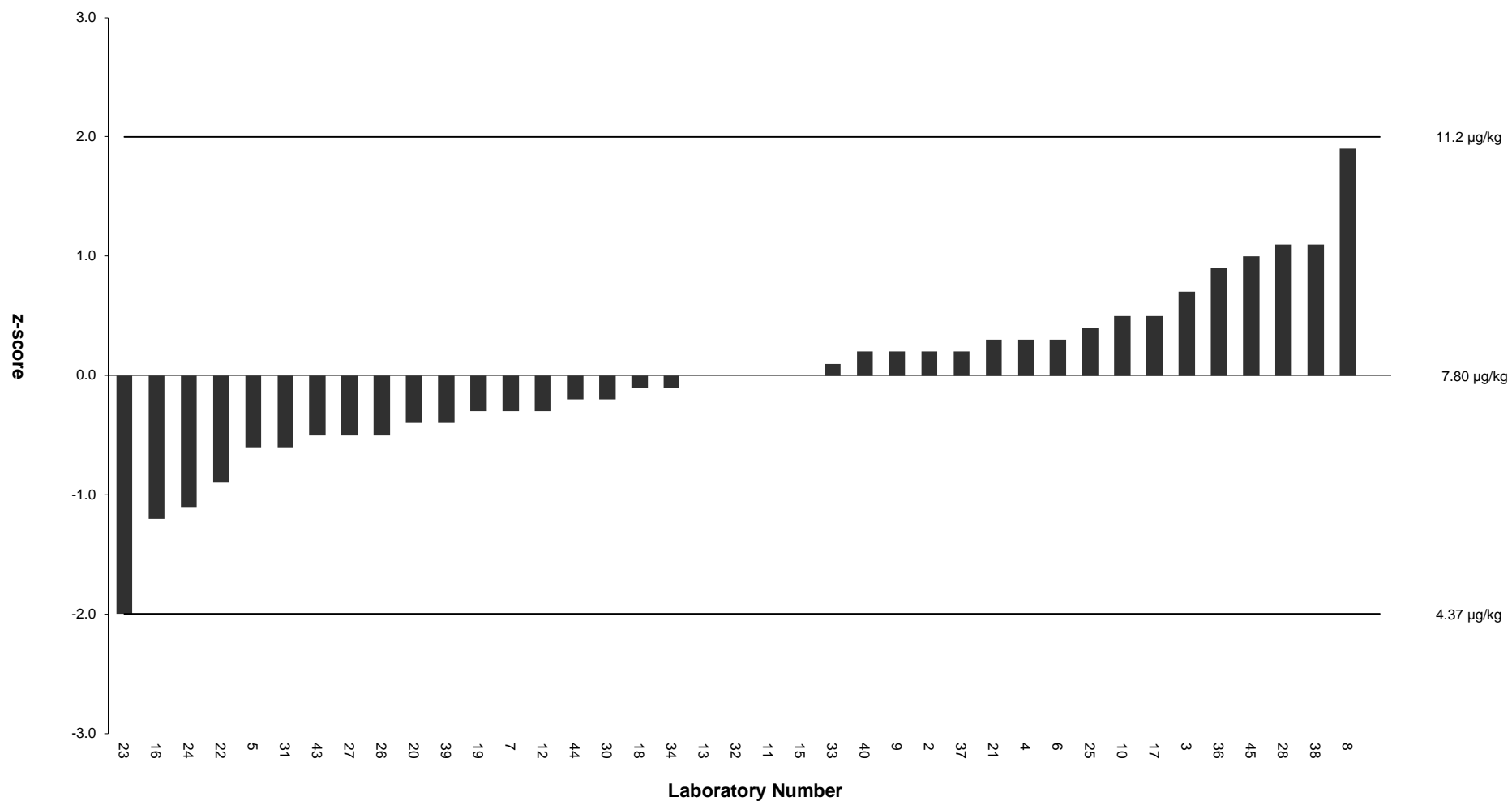


Figure 1: z-Scores for Aflatoxin B₁

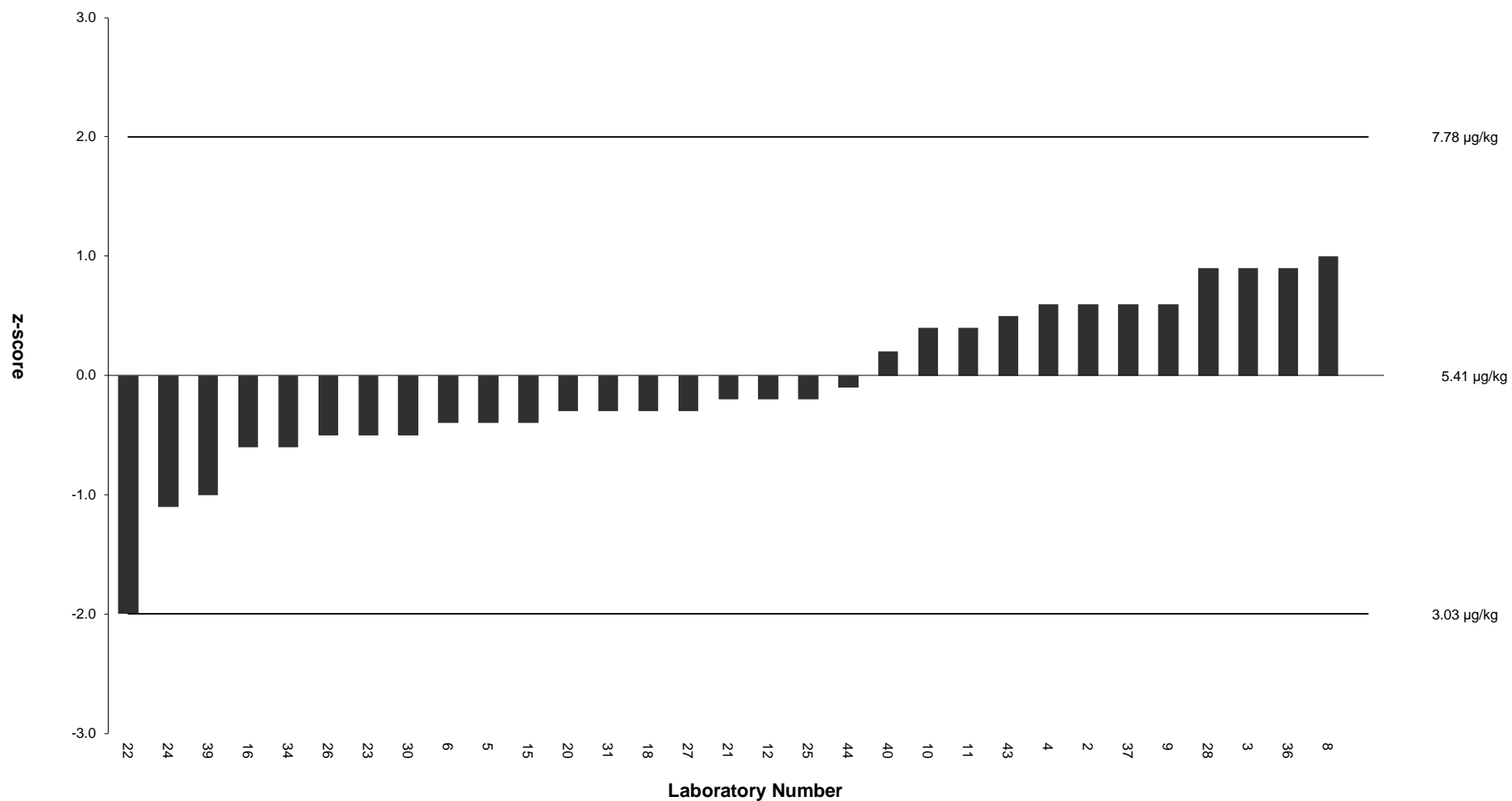


Figure 2: z-Scores for Aflatoxin B₂

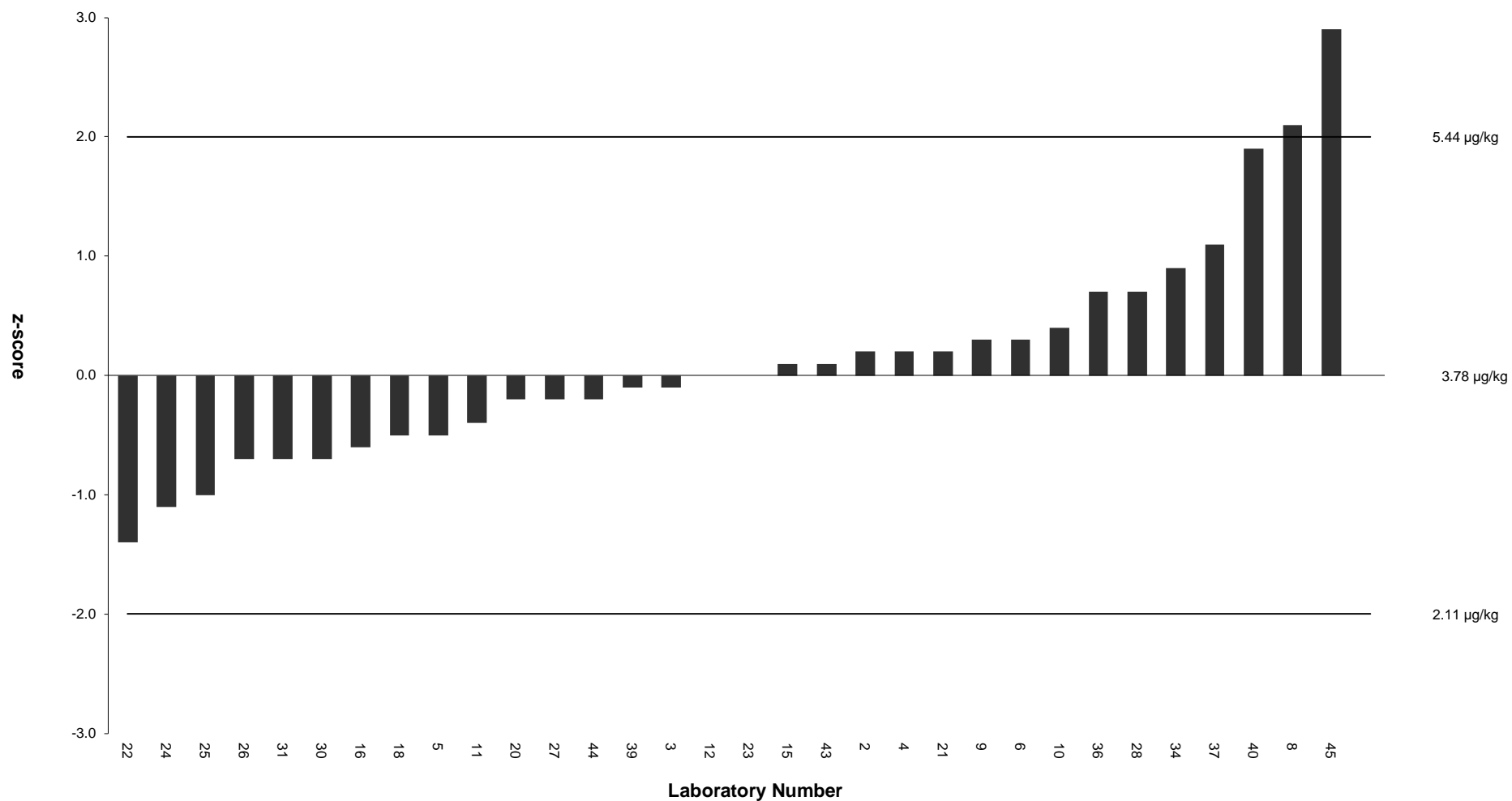


Figure 3: z-Scores for Aflatoxin G₁

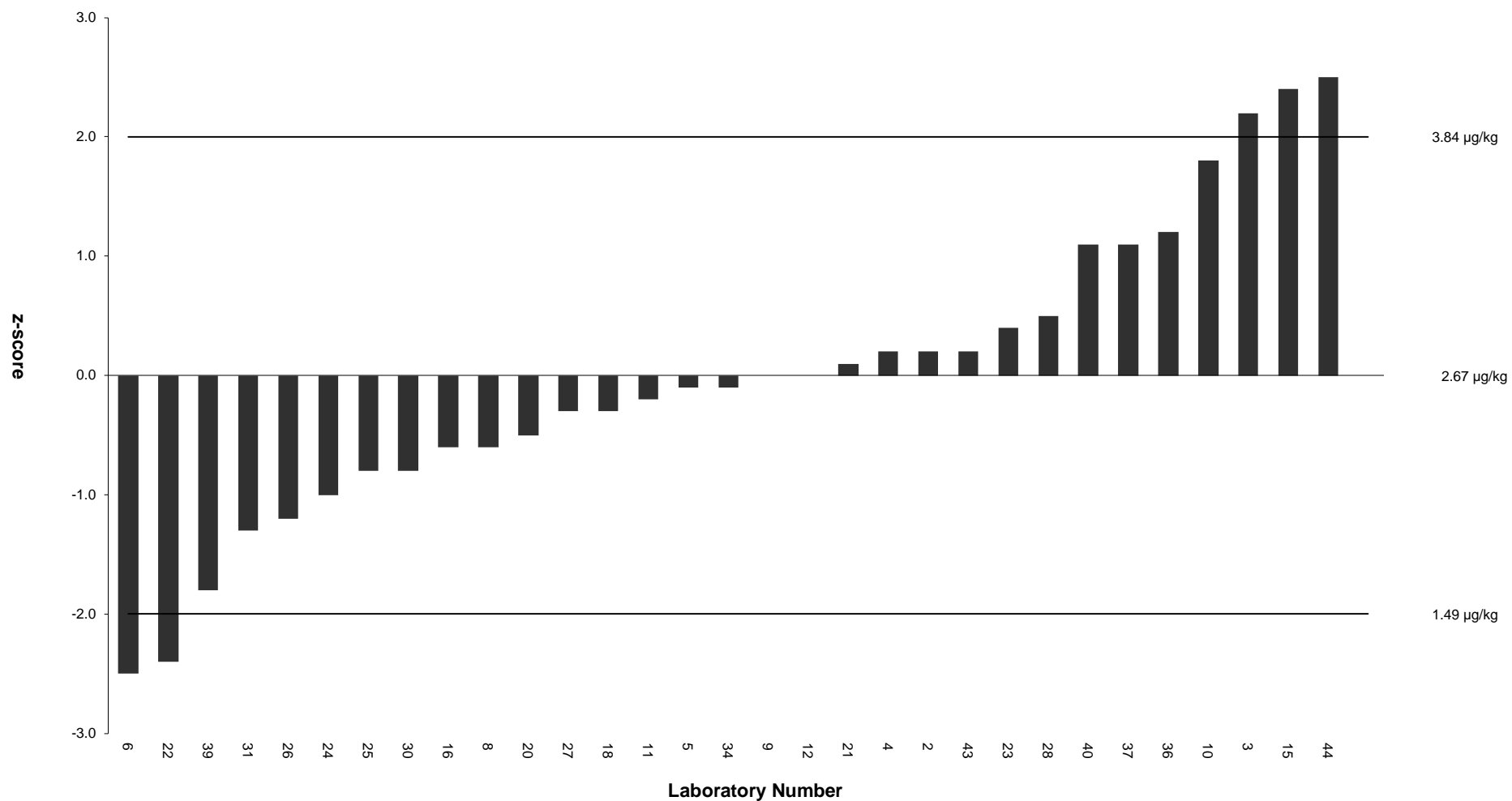


Figure 4: z-Scores for Aflatoxin G₂

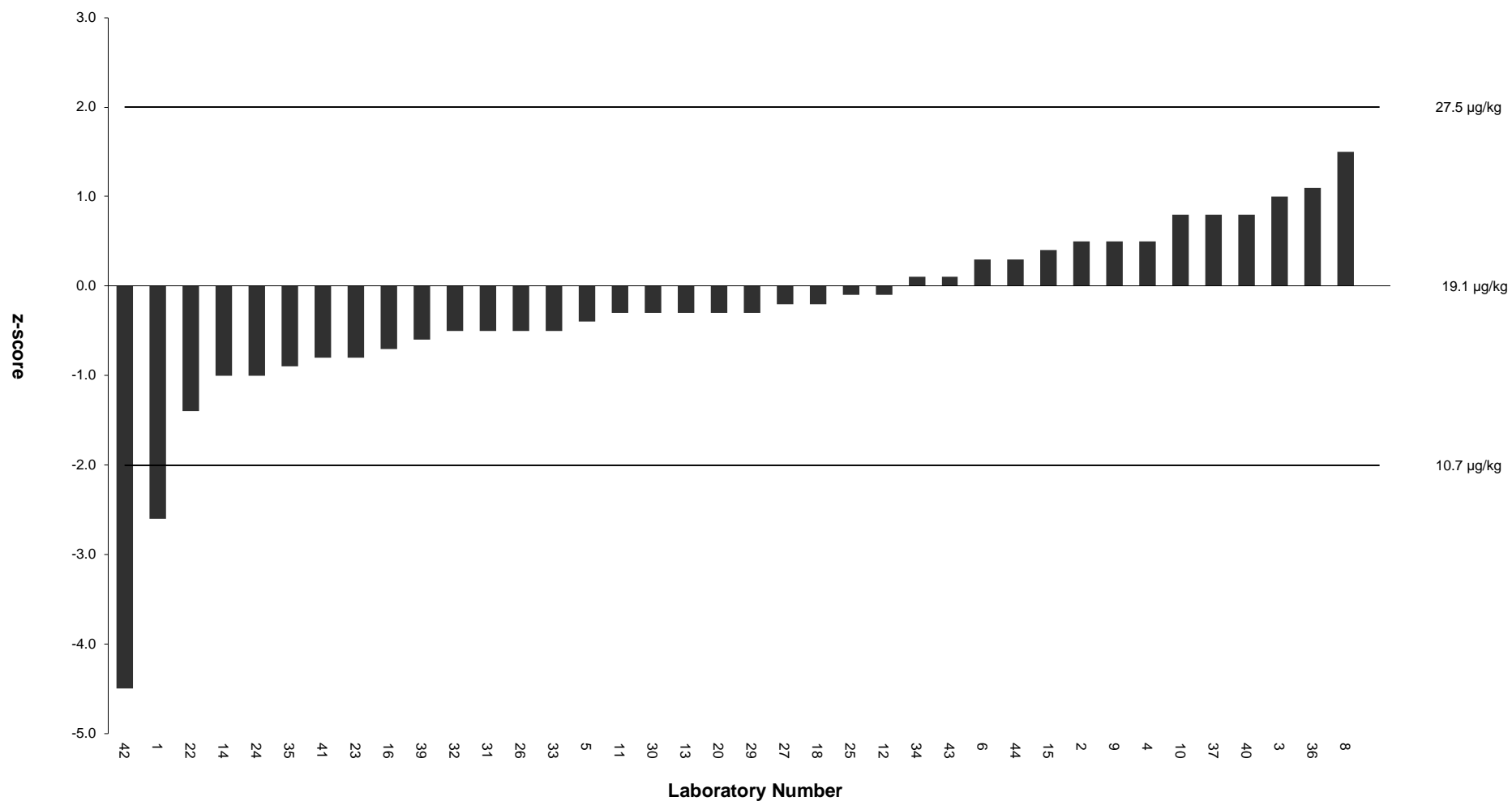


Figure 5: z-Scores for Aflatoxins (total)

APPENDIX I: Analytical Methods Used by Participants

Methods are tabulated according to the information supplied by participants, but some responses may have been combined or edited for clarity. Text that appears as unreadable symbols are derived from entries made using non-Western characters.

Is the Method Used Accredited?	laboratory number
no	006 013 027 029 032 033 037 038 042
yes	001 003 004 005 008 009 010 011 012 014 016 017 018 019 020 022 023 024 028 031 034 035 036 039 040 041 043

What is Your Method Based On?	laboratory number
International Standard	003 006 008 009 012 031 034 036 043
National Standard	038
Paper Published In An International Journal	042
Manufacturer/Kit Instructions/Technical Note	001 005 013 014 018 019 020 027 028 029 032 033 035 041
In house method	004 010 011 016 017 022 023 024 037 039 040

Sample Weight (g)	laboratory number
≥2 - <5	001 003 035 036 039
≥5 - <10	013 014 019 024 027 028 032 033 038 041 043
≥10 - <25	004 010 017 031 037
≥25 - <50	008 009 011 012 016 018 020 022 023 029 034 040 042
≥50	005 006

Extraction Solvent Components	laboratory number
acetone	006 008 009 042
acetonitrile	003 004 010 017 018 020 028 034 039
chloroform	040
dichloromethane	042
formic acid (methanoic acid)	003
hexane	039
methanol	001 005 011 012 014 016 019 022 023 027 029 031 032 033 035 036 037 038 039 041 042
sodium chloride solution	005 027

Extraction Solvent Components (continued)	laboratory number
water	003 005 008 009 010 017 018 020 022 028 031 034 036 039 041 042 043
80:20 Methanol:Water	024
extraction buffer water based	013

Extraction Procedure	laboratory number
add filter aid	040
add NaCl	005 011 012 016 023 036 039
blend / homogenise with solvent	004 005 009 022 029 034 037
maceration/homogenisation	005
shake with solvent	001 006 010 014 017 018 019 020 031 036 041 042
shaking	008 013 027 028 035 039 042
sonicate/ultrasonic bath	003
vortex mix	003 032 033 038 039 043
Adding Nacl, Vortex, Hexane clean up, Centrifuge, SPE	024

Extraction Type	laboratory number
multiple	003 008 014 016 018 022 023 032 033 042
single	001 004 005 006 009 010 011 012 013 017 019 020 024 027 028 029 031 034 035 036 037 038 039 040 041 043

Sample Work Up	laboratory number
centrifuge	003 004 031 035 039 043
dilute	009 010 011 016 018 020 022 023 027 028 031 036 038 041
dry over Na ₂ SO ₄	039
evaporate	039 040 042
filter	001 003 004 005 006 008 009 010 012 013 014 017 018 019 020 027 031 032 033 034 037 039 041 042
pH adjustment	010 018 020 031
filter and dilute	029
Water and Methanol	024

Sample Clean-up by Immunoaffinity Column (Brand)	laboratory number
R-Biopharm Rhone	004 005 006 009 010 018 019 020 024 027 037 043
VICAM	008 011 012 016 023 029
Micotox	034
BIOTEZ	040
C18 extraction columns	042
Eurofins	031
none	013
ROMER	022
Romer IAC	028
Romer lab	036
Veratox 8030 for Aflatoxin Total	001

Sample Clean-up by SPE	laboratory number
fluorescence	016
single-level	008 024
Immuno affinity column (IAC)	023
M2008	034
mycosep 226	017
no	037
none	013 031

Mycotoxin Determination	laboratory number
ELISA	001 013 014 019 032 035 038 041
fluorometric	005 029
HPLC	004 006 008 009 010 012 016 018 020 022 023 027 031 034 036 037 039 040 042 043
Lateral flow	033
MS-MS	003 017 028
B1,B2,G1,G2 by HPLC , AF(Total) by Fluorometry	011
HPLC FLD	024

HPLC Injection Volume (µl)	laboratory number
<5	028
≥5 - <10	003 017 034 042
≥10 - <25	010 011 016 022 023 039 040 043
≥25 - <50	004 036
≥50 - <100	012 020 027
≥100 - <150	005 006 008 009 018 024 031 037

HPLC Column Packing	laboratory number
C18	003 004 005 006 008 009 010 011 012 016 017 018 020 022 023 024 027 028 031 034 036 037 039 040 042 043
endcapped	017 027
non-endcapped	010

HPLC Column Temperature (°C)	laboratory number
ambient	004 005 008 011 012 022 024 027 037 039 043
>ambient - <50	003 006 009 010 016 017 018 020 023 028 031 034 036 040 042

Mobile Phase Components	laboratory number
acetonitrile	003 004 005 008 009 010 017 022 031 034 036 042 043
formic acid (methanoic acid)	003 017 028
HNO ₃ & KBr (for Kobra Cell)	005 006 008 009 010 018 020 031 042
methanol	004 005 008 009 010 012 016 018 020 022 027 028 031 034 036 039 042 043
water	003 004 005 008 009 010 017 018 020 022 027 028 031 034 036 039 042 043
4M HNO ₃	009
ammonium acetate	039
Methanol : DI water : Acetonitrile	023
Methanol/acetonitril/eau	040
Methanol: ACN:UPW	037
Potassium bromide	004
Water:Methanol (2:1), Acetonitrile	024

Mobile Phase Flow Rate (ml/min)	laboratory number
≥0.25 - <0.75	003 017 028 034 037
≥0.75 - <1.25	004 006 008 009 010 011 012 016 018 020 022 023 024 027 031 036 039 040 043
≥1.25 - <1.75	005
≥1.75 - <2.25	042

Post Column Mobile Phase Flow Rate (ml/min)	laboratory number
<0.25	037
≥0.25 - <0.75	027 034
≥0.75	004 006 008 011 018 020 024

HPLC Pre Column Derivatisation	laboratory number
TFA	016 022 023
none	003 004 006 008 011 012 024 028 031 036 042
Phred	037

HPLC Post Column Derivatisation	laboratory number
Kobra cell	004 005 006 008 009 010 018 020 031 042
pyridinium bromide perbromide (C ₅ H ₆ Br ₃ N)	027
none	003 016 028 036
LC-TECH	024
Photochemical reaction	011
Photochemical reactor	043
PHRED	034 037
UV	040

Source of Standards	laboratory number
Dr Ehrenstorfer	016
Fluka	031
Merck	006
R-Biopharm Rhone	004 018 041
Romer Labs	003 009 017 039
Sigma/Aldrich	005 010 011 023 027 028 036 037 043
Supelco	008 012

Source of Standards (continued)	laboratory number
VICAM	029
Micotox	034
FERMENTERK	022
LIBIOS	042
Pribolab	038
ProGnosis Biotech S.A.	032 033
Trilogy	018 035
Trilogy	024

HPLC Detector Type	laboratory number
fluorescence	004 005 006 008 009 010 011 012 016 018 020 022 023 024 027 031 034 036 037 040 042 043
MS-MS	003 017 028 039

APPENDIX II: Fapas[®] SecureWeb, Protocol and Contact Details

1. Fapas[®] SECUREWEB

Access to the secure area of our website is only available to participants in our proficiency tests. Please contact us if you require a UserID and Password. Fapas[®] SecureWeb allows participants to:

- Obtain their laboratory numbers for the proficiency tests in which they have participated.
- View the results they submitted in past and current proficiency tests.
- Submit their results and methods for current tests.
- Review future tests they have ordered.
- Order proficiency tests, reference materials and quality control materials.
- Freely download copies of reports (PDF file), of proficiency tests in which they have participated.
- View charts of their z-scores obtained in previous Fapas[®] – Food Chemistry proficiency tests.

2. PROTOCOL

The Protocols [7, 8] set out how Fapas[®] – Food Chemistry is organised. Copies can be downloaded from our website.

3. CONTACT DETAILS

This report was prepared and authorised on behalf of Fapas[®] by Claire Williamson (Round Coordinator). Participants with any comments or concerns about this proficiency test should contact:

Fapas[®]

Fera Science Ltd (Fera)
York Biotech Campus
Sand Hutton
York
YO41 1LZ
UK

Tel: +44 (0)1904 462100

info@fapas.com

fapas.com