METROLOGY SERVICE

Director
Metrology service Ltd.

Nataliia BOZHKO
February 21st 2024

PROFICIENCY TESTING PT.UA.1.2.2016

MAIZE ANALYSIS (QUALITY)

PROFICIENCY TESTING REPORT

ROUND 8 FEBRUARY 2024

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2. SUMMARY

2.1. The purpose of proficiency testing in maize testing is to demonstrate the laboratory's competence (as described in ISO/IEC 17043:2023[1]) and improve the reliability of test results.

2.2. This proficiency testing involves the use of inter-laboratory comparisons to confirm the performance of individual laboratories' abilities and/or identify areas of improvement.

2.3. This is the final report on the PT.UA.1.2.2016 Round 8 held in February 2024. This report is issued according to ISO/IEC 17043[1] and PT.UA.1.2.2016 Round 8 Programme. The report is issued in two languages – Ukrainian and English. English should be considered as the basic language of the report. Both versions of this report can be found at: http://www.metrologyservice.com.ua.

2.4. A total of 51 participants have reported. Their results are presented in the next clauses.

2.5. Technical experts list and/or subcontractors for this round can be provided to the Participant by request.

2.6. Any calculations, formulas, raw and intermediate data used in this round can be provided to the Participant by request, except confidential information about other participants and information that may contain commercial secret.

3. GENERAL PROTOCOL FOR PROFECIENCY TESTING

3.1. MANAGEMENT SYSTEM.

3.1.1. The functioning management system of Metrology service Ltd. (further - Provider) complies with ISO/IEC 17043[1] requirements and covers all aspects of proficiency testing (further - PT) for all proficiency tests.

3.2. SAMPLES PREPARATION, HOMOGENITY AND STABILITY

3.2.1. Provider has used a validated procedure and appropriate technical experts and contractors for the samples' selection, production, homogenization and division designs that are proved to be satisfactory for the purposes of PT programme PT.UA.1.2.2016 Round 8. Details of test material preparation and homogenization are not published in the report, though can be provided to the Participant by request. Tests, required to prove (validate) homogeneity and stability of samples were performed by competent contracting laboratories according to [1]. These results with statistics are published in the report.

3.2.2. Participants may contact the Provider to request details of test material selection, preparation, homogenization and division of those test material samples, for which they tested in PT. Such information can be provided to the Participant in confidence and only if it cannot compromise other Participants and/or is not a commercial secret.

3.3. DISPATCH AND RECEIPT OF SAMPLES

3.3.1. Samples of test material – **Maize (*Zéa máys*) (**Sample A and Sample B) were dispatched 22.01.2024 according to schedule of proficiency testing programme PT.UA.1.2.2016 Round 8.

3.3.2. Each produced and identified sample was hermetically sealed.

3.3.3. A total of 51 participants in 4 countries received one sample. Results were returned from 51 participants.

3.4. FOLLOW-UP SERVICES

3.4.1. If a participant wish to obtain advice/consultation on any aspect of their performance, one should contact the Provider. Provider can (with agreement with Participant) pass on the Participant's inquiry to a technical expert and/or contracting laboratory.

3.4.2. Surplus samples from this round are available for sale as certified reference materials (CRM) with the certified values and uncertainties. Please e-mail Provider for details.

3.5. PERFORMANCE ASSESMENT

3.5.1. Provider expressed Participant's results as traditional z-scores according to [1].

3.5.2. The assigned value for each analyte was calculated as the robust mean of the trial data using Huber H15 method [2] or Algorithm A variation, Annex C.3 [4].

3.5.3 The target standard deviation for each analyte was chosen from either the appropriate form of the Horwitz equation, method trial standard deviation (if stated in the method from inter-laboratory comparisons), standard deviation from the previous trials (PT rounds), or the robust trial standard deviation, after the removal of outliers. The choice was made using current industry practices used in other collaborative trials and proficiency testing schemes.

3.5.4. z-Scores were deemed satisfactory if $|z| \leq 2$. z-Scores were deemed questionable if $2 < |z| \leq 3$ (marked yellow in tables). If $|z| > 3$, the results were considered to be unsatisfactory (marked red in tables). The calculations were made according to [1,3,5]. Provider recommends corrective actions if $|z| > 3$ and preventive actions if $2 < |z| \leq 3$.

3.5.5. Only 1.47% (8 results) of all results in this round were considered to be unsatisfactory. In Round 7, there were 1.47% (6 results) unsatisfactory results.

3.5.6. Participant №32 stated the result for «Moisture content, %» according to «GOST 13586.5-2015» method instead of the «ГОСТ 13586.5-93» proposed by the Provider. This result was assessed by the Provider.

3.5.7. Participant №33 stated the result for «Moisture content, %» according to «GOST 13586.5-2015» method instead of the «ГОСТ 13586.5-93» proposed by the Provider. This result was assessed by the Provider.

3.5.8. Participant № 39 stated the result for «Starch content, % (Expressed on dry matter) according to «Методом розробленим лабораторією з використанням антронового реактиву» method instead of the «ГОСТ 10845-98» proposed by the Provider. This result was assessed by the Provider but was not taken into account when calculating robust mean and robust SD.

4. HOMOGENITY AND STABILITY ASSESMENT

4.1. Qualitative methods.

4.1.1. Samples were testes for homogeneity and stability after blending, preparation, packing and identification by selecting five samples (Sample B) of material of all produced. All these samples were tested under repeatability conditions as only 56 samples were produced according to [7]. All samples for stability and homogeneity testing were stored in appropriate conditions in the preparation and reporting of this round.

4.1.2. Homogeneity and stability were deemed satisfactory only if 100% of results are identical with intended results, i.e. with “Satisfactory (S)” result.

4.1.3. Homogeneity and stability for «Colour»

Sample N	Colour	Test result	Satisfactory/ Not satisfactory
1	Colour	Typical of normal grain	«Satisfactory (S)»
2	Colour	Typical of normal grain	«Satisfactory (S)»
3	Colour	Typical of normal grain	«Satisfactory (S)»
4	Colour	Typical of normal grain	«Satisfactory (S)»
5	Colour	Typical of normal grain	«Satisfactory (S)»

Homogeneity and stability confirmed by 100% of satisfactory results.

4.1.4. Homogeneity and stability for «Odor»

Sample N	Odor	Test result	Satisfactory/ Not satisfactory
1	Odor	Complies with healthy grain	«Satisfactory (S)»
2	Odor	Complies with healthy grain	«Satisfactory (S)»
3	Odor	Complies with healthy grain	«Satisfactory (S)»
4	Odor	Complies with healthy grain	«Satisfactory (S)»
5	Odor	Complies with healthy grain	«Satisfactory (S)»

Homogeneity and stability confirmed by 100% of satisfactory results.

4.2. Quantitative methods.

4.2.1. Samples were assessed for homogeneity and stability after blending and packing by selecting seven **(**Sample A) and five (Sample B) samples of material at random from all those produced. Four **(**Sample A) and three (Sample B) of these samples were tested in duplicate under repeatability conditions as only 76 **(**Sample A) and 56 (Sample B) samples were produced according to [7]. Three **(**Sample A) and two (Sample B) other samples for stability tests were stored in appropriate conditions for the period of preparation and test submission for this round. They were also tested in duplicate.

4.2.2. Statistical analysis of the resulting data for homogeneity and stability was carried out using the industry standard Cochran’s ‘C’ test and analytical variance test for ‘sufficient homogeneity’ according to [3] or Annex B.2[4].

4.3. Produced samples were found to be sufficiently homogeneous and stable for every analyte according to programme, except for those that can be considered equivalent or homogeneity can be assumed from other analyte homogeneity.

4.4. ISO 6540:1980/ ДСТУ ISO 6540:2007 Moisture content, %

	Moisture content, %		**ISO 6540:2021/ ДСТУ ISO 6540:2007**								
	Дослідження гомогенності/Homogenity test										
	Аналіз викидів за тестом Кохрана(C -тест)/Cohran's C test for outliers						Аналіз на 'достатню однорідність'/Test for 'sufficient homogenity'				
	Sample number	Результат/ Result A	Результат/ Result B	Average	SD²		Номер зразку /Sample number	Результат/ Result A	Результат/ Result B	SUM	Difference²
	1	13,68	13,67	13,68	0,0000	0,00	1	13,68	13,67	27,35	0,0001
	2	13,63	13,67	13,65	0,0008	0,00	2	13,63	13,67	27,30	0,0016
	3	13,68	13,65	13,67	0,0004	0,00	3	13,68	13,65	27,33	0,0009
	4	13,65	13,68	13,67	0,0004	0,00	4	13,65	13,68	27,33	0,0009
	5	13,65	13,62	13,64	0,0005	0,00	5	13,65	13,62	27,27	0,0009
	6	13,58	13,53	13,56	0,0013	0,00	6	13,58	13,53	27,11	0,0025
	7	13,56	13,54	13,55	0,0002	0,00	7	13,56	13,54	27,10	0,0004
											0,0073
	Mean	13,628		Worst pair	0,0013		Mean	13,628			
	Max	13,68		SUM of SD²	0,0037		Max	13,68			
	Min	13,53		C	0,3425		Min	13,53			
				Ccr, 5%	0,7271						
				Ccr, 1%	0,8376		Analytical variance S²ar	0,0005	SD	0,0537	
				Conclusion			Sanal	0,0228	RSDR	0,3938	
				5%	PASS		Ssums	0,0113			
				1%	PASS		MSb	0,0056			
						Between sample variance S²sam		0,0026			
	Remarks										
	1. Cohran's C test is described in ISO 5727-2 and ISO 13528:2022										
	2. Test for 'sufficient homogenity' is performed according to Annex B ISO 13528:2022										

Source of σp value to use		
Use(write '1')	Source	σp
	C>13.8%, HORWITZ	0,3692
1	120ppb<C<13.8%, HORWITZ	0,3679
	C<120 ppb	2,998129
MASS NEGATIVE POWER FOR HORWITZ EQUATION(%=2, ppb=9,ppm=6)		2
	SD	0,0517
	Trial SD	0,3660
	Target SD chosen	0,3679
	σ²all	0,012181
	Replicates	7
	F1	2,1
	F2	1,43
	Critical value	0,0263
	Between sample variance S²sam	0,0026
	Sufficient homogenity test	PASS

4.5. Data for all analytes

	EN 16378:2013	EN 16378:2013	EN 16378:2013	ISO 7971-3:2019	ДСТУ ГОСТ 10840:2019 (ГОСТ 10840–2017, IDT)
	Broken grains, %	Grain impurities, %	Miscellaneous impurities, %	Bulk density, kg/hl (use of Nilema litre apparatus)	Test weight, g/l
Homogenity and stability (Гомогенність та стабільність)					
Cohran's 'C' test (С-тест "Кохрана")					
Crtitical value (5%,5pairs)=0,8413	0,4739	0,3168	0,4186	0,2353	0,4737
Mean Result	2,0980	1,9000	1,0840	74,4300	709,7000
Conclusion (Висновок)	PASS	PASS	PASS	PASS	PASS
Analytical variance test (тест аналітичної дисперсії)					
S^2anal	0,0084	0,0038	0,0245	0,0170	1,9000
Sanal	0,0919	0,0618	0,1564	0,1304	1,3784
S^2sample	0,0238	0,0388	0,0119	0,0060	0,6250
σ_p	0,4510	0,8790	0,0428	1,2500	6,0330
σ_p source	Trial SD	Trial SD	Horwitz	Trial SD	Trial SD
σ^2all	0,0183	0,0695	0,0002	0,1406	3,2757
Critical value	0,0611	0,1729	0,0517	0,3692	11,7524
Conclusion (Висновок)	PASS	PASS	PASS	PASS	PASS

	ISO 6540:2021/ ДСТУ ISO 6540:2007	ISO 20483:2013/ ДСТУ ISO 20483:2016	ISO 2171:2023/ ДСТУ ISO 2171:2009	ISO 11085:2015	ISO 6865:2000/ ДСТУ EN ISO6865:2022	ISO 6493:2000	GAFTA 7.0:2018
	Moisture content, %	Crude protein content, % (Expressed on dry matter, factor for converting nitrogen content to protein content - 6.25.)	Ash yield, % (Expressed on dry matter)	Fat content, % (Expressed as a mass fraction of the product as received)	Crude fibre content, % (Expressed as a mass fraction of the product as received)	Starch content, %	Volatile nitrogenous basis, mg/100g
Homogenity and stability (Гомогенність та стабільність)							
Cohran's 'C' test (С-тест "Кохрана")							
Crtitical value (5%,7pairs)=0,7271	0,3425	0,4093	0,6161	0,4446	0,4876	0,2168	0,3571
Mean Result	13,6279	8,0243	1,1916	3,3814	2,0370	61,7457	14,3714
Conclusion (Висновок)	PASS	PASS	PASS	PASS	PASS	PASS	PASS
Analytical variance test (тест аналітичної дисперсії)							
S^2anal	0,0005	0,0050	0,0001	0,0058	0,0007	0,0074	0,2000
Sanal	0,0228	0,0710	0,0072	0,0762	0,0270	0,0861	0,4472
S^2sample	0,0026	0,0012	0,0002	0,0016	0,0009	0,0295	0,0000
σ_p	0,3679	0,1400	0,0464	0,1126	0,0732	0,7858	0,3849
σ_p source	Horwitz	Method Tr SD	Horwitz	Horwitz	Horwitz	Horwitz	Horwitz
σ^2all	0,0122	0,0018	0,0002	0,0011	0,0005	0,0556	0,0133
Critical value	0,0263	0,0109	0,0005	0,0107	0,0021	0,1273	0,3140
Conclusion (Висновок)	PASS	PASS	PASS	PASS	PASS	PASS	PASS

5. DATA SUMMARY

Method	EN 16378:2013	EN 16378:2013	EN 16378:2013	ISO 19942:2018	ISO 19942:2018	ISO 19942:2018	ISO 19942:2018	ISO 7971-3:2019	USDA (Grain Grading Procedures, Chapter 4 – Corn, October 1, 2020)
	Broken grains, %	Grain impurities, %	Miscellaneous impurities, %	Broken grains, %	Damaged grains, %	Other grains, %	Miscellaneous impurities, %	Bulk density, kg/hl (use of Nilema litre apparatus)	Broken Corn, %
No of Results	20	20	20	9	9	9	9	7	10
No of Results |z|>3 or NS	0	0	0	0	0	0	0	0	0
No of Results |z|>3,% or NS,%	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Mean	2,210	1,643	0,889	2,231	1,546	0,061	0,946	74,114	2,561
Min	1,760	0,530	0,380	1,850	0,570	0,020	0,780	73,500	2,330
Max	2,780	3,760	1,280	2,670	3,490	0,140	1,310	74,600	2,860
SD	0,267	0,849	0,249	0,264	0,879	0,037	0,167	0,402	0,158
Median	2,180	1,455	0,945	2,230	1,320	0,060	0,880	74,100	2,535
Robust mean (assigned value)	2,196	1,513	0,896	2,223	1,386	0,056	0,922	74,118	2,553
Robust SD	0,213	0,530	0,228	0,250	0,546	0,027	0,115	0,396	0,135
SD from method (Tr.SD)	0,740	1,230	0,390	0,575	1,084	0,102	0,383	N/A	N/A
SD from Horwitz eq.	0,078	0,057	0,036	0,079	0,053	0,003	0,037	N/A	0,089
Target SD	0,451	0,879	0,390	0,575	1,084	0,102	0,383	1,250	0,135
Source of target SD of PT	Trial SD	Trial SD	Method Tr SD	Method Tr SD	Method Tr SD	Method Tr SD	Method Tr SD	Trial SD	Trial SD

Method	USDA (Grain Grading Procedures, Chapter 4 – Corn	USDA (Grain Grading Procedures, Chapter 4 – Corn, October 1, 2020)	USDA (Grain Grading Procedures, Chapter 4 – Corn, October 1, 2020)	ДСТУ ГОСТ 10840:2019 (ГОСТ 10840–2017, IDT)	ГОСТ 30483-97/ ДСТУ 4525:2006	ГОСТ 30483-97/ ДСТУ 4525:2006	Laboratory choice	Laboratory choice
	Foreign material, %	Damaged kernels, %	Test weight, lbu/bu	Test weight, g/l	Foreign impurities, %	Grain impurities, %	Odour	Colour
No of Results	10	10	9	33	44	44	26	25
No of Results |z|>3 or NS	0	0	0	0	1	0	0	0
No of Results |z|>3,% or NS,%	0,000	0,000	0,000	0,000	2,273	0,000	0,000	0,000
Mean	0,539	2,806	56,083	715,332	1,058	4,359		
Min	0,430	1,880	55,200	707,000	0,580	2,640		
Max	0,660	4,850	57,600	727,000	1,940	6,550		
SD	0,072	1,111	0,921	5,450	0,259	1,015		
Median	0,550	2,100	55,520	714,000	1,020	4,075		
Robust mean (assigned value)	0,538	2,719	55,989	714,834	1,036	4,204		
Robust SD	0,067	0,953	0,756	4,468	0,193	0,684		
SD from method (Tr.SD)	N/A	N/A	N/A	N/A	0,300	1,000		
SD from Horwitz eq.	0,024	0,094	N/A	N/A	0,041	0,135		
Target SD	0,112	1,265	0,836	6,033	0,300	1,000		
Source of target SD of PT	Trial SD	Trial SD	Trial SD	Trial SD	Method Tr SD	Method Tr SD		

Method	ISO 6540:2021/ ДСТУ ISO 6540:2007	ISO 12099:2017	ISO 20483:2013/ ДСТУ ISO 20483:2016	ISO 16634-2:2016	ISO 12099:2017	ISO 2171:2023/ ДСТУ ISO 2171:2009	ISO 6492:1999/ ДСТУ ISO 6492:2003	ISO 11085:2015	ISO 12099:2017	ISO 6865:2000/ ДСТУ EN ISO6865:2022
	Moisture content, %	Moisture content, %	Crude protein content, % (Expressed on dry matter, factor for converting nitrogen content to protein content - 6.25.)	Crude protein content, % (Expressed on dry matter, factor for converting nitrogen content to protein content - 6.25.)	Crude protein content, % (Expressed on dry matter, factor for converting nitrogen content to protein content - 6.25.)	Ash yield, % (Expressed on dry matter)	Fat content, % (Expressed as a mass fraction of the product as received)	Fat content, % (Expressed as a mass fraction of the product as received)	Fat content, % (Expressed as a mass fraction of the product as received)	Crude fibre content, % (Expressed as a mass fraction of the product as received)
No of Results	26	7	13	2	6	14	12	6	6	12
No of Results |z|>3 or NS	1	1	1	0	0	0	0	1	1	0
No of Results |z|>3, % or NS,%	3,846	14,286	7,692	0,000	0,000	0,000	0,000	16,667	16,667	0,000
Mean	13,462	13,024	8,112	8,010	8,117	1,241	3,313	3,247	3,177	1,779
Min	12,420	9,900	7,810	7,950	7,880	1,190	3,110	2,850	2,240	1,550
Max	13,760	13,700	8,530	8,070	8,330	1,270	3,540	3,470	3,600	1,980
SD	0,303	1,403	0,172	0,085	0,147	0,021	0,115	0,218	0,476	0,136
Median	13,550	13,690	8,100	8,010	8,110	1,240	3,295	3,255	3,285	1,800
Robust mean (assigned value)	13,537	13,457	8,101	8,010	8,122	1,243	3,310	3,282	3,305	1,782
Robust SD	0,130	0,350	0,107	0,085	0,123	0,017	0,089	0,146	0,159	0,130
SD from method (Tr.SD)	N/A	N/A	0,140	0,330	N/A	0,033	0,1990	N/A	N/A	N/A
SD from Horwitz eq.	0,366	0,364	0,236	0,234	0,237	0,048	0,111	0,110	0,110	0,065
Target SD	0,366	0,364	0,140	0,234	0,237	0,048	0,1370	0,110	0,110	0,130
Source of target SD of PT	Horwitz	Horwitz	Method Tr SD	Horwitz	Horwitz	Horwitz	Trial SD	Horwitz	Horwitz	Trial SD

Method	ISO 12099:2017	ISO 6493:2000	ISO 12099:2017	GAFTA 7.0:2018	ГОСТ 13586.5-93	ДСТУ 4117:2007	ДСТУ 7169:2010	ГОСТ 13496.15-97	ДСТУ 8844:2019	ГОСТ 10845-98
	Crude fibre content, % (Expressed as a mass fraction of the product as received)	Starch content, %	Starch content, %	Volatile nitrogenous basis, %	Moisture content, %	Moisture content, %	Mass fraction of crude protein, % (Expressed on dry matter, factor for converting nitrogen content to protein content - 6.0.)	Mass fraction of crude fat, % (Expressed on dry matter)	Mass fraction of crude fibre, % (Expressed on dry matter)	Starch content, % (Expressed on dry matter)
No of Results	4	4	2	2	48	30	12	12	8	3
No of Results |z|>3 or NS	0	1	0	0	0	1	0	0	0	0
No of Results |z|>3, % or NS,%	0,000	25,000	0,000	0,000	0,000	3,333	0,000	0,000	0,000	0,000
Mean	1,800	56,330	62,020	0,016	13,251	13,238	7,843	3,758	1,946	75,300
Min	1,500	36,120	61,540	0,014	12,700	10,050	7,590	3,550	1,460	71,890
Max	2,070	64,700	62,500	0,017	13,550	13,800	8,360	3,900	2,340	79,350
SD	0,258	13,525	0,679	0,002	0,178	0,650	0,223	0,104	0,303	3,771
Median	1,815	62,250	62,020	0,016	13,300	13,365	7,775	3,745	1,980	74,660
Robust mean (assigned value)	1,800	63,067	62,020	0,016	13,270	13,345	7,796	3,764	1,954	77,005
Robust SD	0,258	1,444	0,679	0,002	0,127	0,127	0,123	0,092	0,290	3,316
SD from method (Tr.SD)	N/A	N/A	N/A	N/A	0,700	N/A	N/A	N/A	N/A	N/A
SD from Horwitz eq.	0,066	0,794	0,788	0,001	0,360	0,361	0,229	0,123	0,071	0,878
Target SD	0,198	2,477	0,788	0,001	0,360	0,361	0,229	0,123	0,290	3,316
Source of target SD of PT	Trial SD	Trial SD	Horwitz	Horwitz	Horwitz	Horwitz	Horwitz	Horwitz	Trial SD	Trial SD

6. RAW DATA

Method	EN 16378:2013	EN 16378:2013	EN 16378:2013	ISO 19942:2018	ISO 19942:2018	ISO 19942:2018	ISO 19942:2018	ISO 7971-3:2019	USDA (Grain Grading Procedures, Chapter 4 – Corn, October 1, 2020)	USDA (Grain Grading Procedures, Chapter 4 – Corn, October 1, 2020)
Laboratory number	Broken grains, %	Grain impurities, %	Miscellaneous impurities, %	Broken grains, %	Damaged grains, %	Other grains, %	Miscellaneous impurities, %	Bulk density, kg/hl (use of Nilema litre apparatus)	Broken Corn, %	Foreign material, %
1	2,06	1,93	1,28	2,10	1,47	0,09	1,31	74,60	2,50	0,66
2	2,04	1,82	0,64							
3										
4	2,03	2,29	1,08	-	-	-	-	-	2,51	0,61
5	-	-	-	-	-	-	-	-	-	-
6	2,55	1,43	1,05	2,41	1,20	0,05	1,02	-	2,74	0,56
7	2,63	3,65	1,09	2,67	3,49	0,14	1,03		2,86	0,58
8										
9										
10	1,82	1,21	0,38							
11	2,18	3,76	0,57							
12	-	-	-	-	-	-	-	-	-	-
13										
14	1,76	0,82	0,54					73,80		
15										
16										
17										
18										
19										
20										
21										
22	2,22	0,98	0,94	2,12	0,86	0,06	1,00			
23										
24										
25										
26	1,92	2,03	0,74	1,85	2,36	0,06	0,86		2,33	0,54
27	2,26	2,01	1,11							
28										
29										
30										
31										
32	2,18	1,16	1,15	-	-	-	-	74,10	2,43	0,43
33	2,19	1,10	1,10	2,23	1,46	0,03	0,80	74,2	2,56	0,45
34	2,18	1,15	1,06					73,50	-	-
35										
36										
37	2,08	1,56	0,68							
38	2,04	1,48	0,64	1,93	1,18	0,03	0,78		2,44	0,47
39										
40										
41	2,55	0,79	1,10	2,49	0,57	0,02	0,88	74,60	2,67	0,56
42	2,41	0,53	0,95							
43										
44										
45	-	-	-	-	-	-	-	-	-	-
46										
47										
48										
49	-	-	-	-	-	-	-	-	-	-
50	2,78	1,92	0,81	-	-	-	-	74,00	-	-
51	2,31	1,24	0,86	2,28	1,32	0,07	0,83		2,57	0,53

Method	USDA (Grain Grading Procedures, Chapter 4 – Corn, October 1, 2020)	USDA (Grain Grading Procedures, Chapter 4 – Corn, October 1, 2020)	ДСТУ ГОСТ 10840:2019 (ГОСТ 10840–2017, IDT)	ГОСТ 30483-97/ ДСТУ 4525:2006	ГОСТ 30483-97/ ДСТУ 4525:2006	Laboratory choice	Laboratory choice
Laboratory number	Damaged kernels, %	Test weight, lbu/bu	Test weight, g/l	Foreign impurities, %	Grain impurities, %	Odour	Colour
1	2,91	55,52	714,00	1,25	3,84	Відповідає здоровому зерну	Властивий нормальному зерну
2				0,78	3,42	-	-
3						-	-
4	4,85	56,22	723,00	-	-	Відповідає здоровому зерну	Властивий нормальному зерну
5	-	-	-	0,97	3,72	власт	власт
6	4,32	55,40	713,00	1,54	4,58	Відповідає здоровому зерну	Властивий нормальному зерну
7	3,80		722,00	1,20	5,73	-	-
8			715,00	1,00	3,45	-	-
9				1,94	5,90	Відповідає здоровому зерну	-
10			707,00	0,93	3,22	-	-
11			709,00	0,98	4,31	-	-
12	-	-	-	0,74	4,66	-	-
13				1,07	4,21	-	-
14			709,00	0,58	2,64	-	-
15			715	0,96	4,26	-	-
16			717,00	1,00	4,12	-	-
17			718,56	0,97	4,17	Відповідає здоровому зерну	Властивий нормальному зерну
18			712,00	1,20	4,30	-	-
19				1,06	3,94	-	-
20			711,00	0,96	4,94	Відповідає здоровому зерну	Властивий нормальному зерну
21			708,00	0,84	4,87	Відповідає здоровому зерну	Властивий нормальному зерну
22				1,10	5,02	Відповідає здоровому зерну	Властивий нормальному зерну
23			716,61	1,05	3,60	-	-
24			712,00	1,44	4,03	-	-
25			712,00	1,35	3,64	-	-
26	2,12	56,40	714,00	0,79	4,00	Відповідає здоровому зерну	Властивий нормальному зерну
27			711,30	1,34	4,68	Відповідає здоровому зерну	Властивий нормальному зерну
28				1,07	3,50	Відповідає здоровому зерну	Властивий нормальному зерну
29				1,04	3,98	-	-
30			713,00	0,82	6,07	-	-
31				1,00	3,30	Відповідає здоровому зерну	Властивий нормальному зерну
32	2,08	57,5	712	-	-	Complies with healthy grain	Typical of normal grain
33	2,00	57,6	713	-	-	Complies with healthy grain	Typical of normal grain
34	-	-	-	-	-	Complies with healthy grain	Typical of normal grain
35			723,30	0,70	6,30	Відповідає здоровому зерну	Властивий нормальному зерну
36			723,20	1,13	6,55	Відповідає здоровому зерну	Властивий нормальному зерну
37			710,00	0,81	3,35	-	-
38	1,88	55,52	714	0,86	3,65	Відповідає здоровому зерну	Властивий нормальному зерну
39						-	-
40			724,00	1,43	6,30	Відповідає здоровому зерну	Властивий нормальному зерну
41	2,03	55,20	711,00	1,29	3,66	Complies with healthy grain	Typical of normal grain
42				1,00	4,62	Complies with healthy grain	Typical of normal grain
43				1,09	3,54	Відповідає здоровому зерну	Властивий нормальному зерну
44			717,00	0,89	3,98		
45	-	-	727,0	1,06	2,93	Відповідає здоровому зерну	Властивий нормальному зерну
46							
47				1,29	6,48	-	-
48				1,44	6,10	-	-
49	-	-	726,00	0,76	3,87	-	-
50	-	-	720,00	0,75	4,68	Complies with healthy grain	Typical of normal grain
51	2,07	55,39	713,00	1,09	3,68	Відповідає здоровому зерну	Властивий нормальному зерну

Method	ISO 6540:2021/ ДСТУ ISO 6540:2007	ISO 12099:2017	ISO 20483:2013/ ДСТУ ISO 20483:2016	ISO 16634-2:2016	ISO 12099:2017	ISO 2171:2023/ ДСТУ ISO 2171:2009	ISO 6492:1999/ ДСТУ ISO 6492:2003	ISO 11085:2015	ISO 12099:2017	ISO 6865:2000/ ДСТУ EN ISO6865:2022
Laboratory number	Moisture content, %	Moisture content, %	Crude protein content, % (Expressed on dry matter, factor for converting nitrogen content to protein content - 6.25.)	Crude protein content, % (Expressed on dry matter, factor for converting nitrogen content to protein content - 6.25.)	Crude protein content, % (Expressed on dry matter, factor for converting nitrogen content to protein content - 6.25.)	Ash yield, % (Expressed on dry matter)	Fat content, % (Expressed as a mass fraction of the product as received)	Fat content, % (Expressed as a mass fraction of the product as received)	Fat content, % (Expressed as a mass fraction of the product as received)	Crude fibre content, % (Expressed as a mass fraction of the product as received)
1	13,63	13,70	8,10		8,19	1,19	3,37	3,26	3,27	1,98
2	13,60		8,04			1,23	3,40			1,82
3										
4	13,47	9,90	8,20	-	7,88	1,23	3,32	-	2,24	1,94
5	-	-	-	-	-	-	-	-	-	-
6	13,54	13,70	7,95	-	8,10	1,27	3,54	-	3,60	1,55
7	13,70									
8										
9										
10	13,25									
11	13,30									
12	-	-	-	-	-	-	-	-	-	-
13										
14	13,58	13,50			8,12				3,27	
15										
16										
17	13,26									
18										
19										
20										
21										
22	13,50									
23	13,53			8,07						
24										
25										
26	13,72		7,81			1,23		3,47		
27	13,60									
28										
29										
30										
31										
32	13,58	-	8,2	-	-	1,22	3,23	3,23	-	1,8
33	13,50	-	8,2	-	-	1,25	3,25	3,25	-	1,8
34	13,52	-	8,18	-	-	1,27	-	2,85	-	1,75
35										
36										
37	13,64		8,00			1,25	3,38			1,82
38	13,65		8,02			1,24				
39	13,00	12,98	8,53		8,33	1,26	3,27		3,30	1,90
40										
41	13,76	13,70	8,05		8,08	1,26	3,41	3,42	3,38	1,59
42	13,51									
43										
44										
45	13,66	-	-	-	-	-	-	-	-	-
46						1,24	3,20			
47	12,42									
48	12,84									
49	-	-	-	7,95	-	-	3,11	-	-	1,786
50	13,56	-	8,17	-	-	1,24	3,27	-	-	1,61
51	13,70	13,69								

Method	ISO 12099:2017	ISO 6493:2000	ISO 12099:2017	GAFTA 7.0:2018	ГОСТ 13586.5-93	ДСТУ 4117:2007	ДСТУ 7169:2010	ГОСТ 13496.15-97	ДСТУ 8844:2019	ГОСТ 10845-98
Laboratory number	Crude fibre content, % (Expressed as a mass fraction of the product as received)	Starch content, %	Starch content, %	Volatile nitrogenous basis, %	Moisture content, %	Moisture content, %	Mass fraction of crude protein, % (Expressed on dry matter, factor for converting nitrogen content to protein content - 6.0.)	Mass fraction of crude fat, % (Expressed on dry matter)	Mass fraction of crude fibre, % (Expressed on dry matter)	Starch content, % (Expressed on dry matter)
1	2,07	61,96	62,50	0,01	13,48	13,40	7,82	3,87		79,35
2					13,38		7,69			
3					13,55		7,73	3,68	2,16	
4	-	-	-	-	13,21	10,05	7,90	3,83	1,82	-
5	-	-	-	-	13,30	13,38	-	-	-	-
6	1,50	-	-	-	13,24	13,40	7,59	3,90	1,46	-
7					13,30	13,30				
8					13,30	13,40				
9					13,40					
10					13,00	13,35				
11					13,11	13,28				
12	-	-	-	-	13,17	13,28	-	-	-	-
13					13,30	13,50				
14					13,30	13,43				
15					13,30					
16					13,40					
17					13,30					
18						13,40				
19						13,20				
20					13,55	13,75				
21					13,40	13,80				
22					13,20	13,30				
23					13,22					
24					13,30					
25					13,40		7,87	3,71	2,34	74,66
26	1,68	36,12			13,43					
27					13,00	13,40				
28					13,25	13,30				
29					13,40					
30					13,30	13,20				
31					13,20	13,30				
32	-	-	-	-	13,00	-	-	3,71	-	-
33	-	-	-	-	12,95	-	-	3,73	-	-
34	-	-	-	-	-	-	-	-	-	-
35					12,70	12,50	7,72	3,67		
36					13,20	13,13				
37					13,40		7,67			
38					13,37	13,40				
39	1,95	62,54	61,54		12,98	13,06	8,18	3,76	2,18	71,89
40					13,20	13,60				
41		64,70		0,017	13,36		7,72	3,89	1,80	
42					13,20					
43					13,40	13,50				
44					13,40		7,86	3,55	2,14	
45	-	-	-	-	13,40	13,80	-	-	-	-
46					13,00		8,36		1,67	
47					13,10	13,30				
48					13,10	13,00				
49	-	-	-	-	12,90	-	-	-	-	-
50	-	-	-	-	13,30	-	-	3,79	-	-
51					13,40	13,42				

7. Z SCORES AND DATA SUMMERY FOR ASSESSMENT

Method	EN 16378:2013	EN 16378:2013	EN 16378:2013	ISO 19942:2018	ISO 19942:2018	ISO 19942:2018	ISO 19942:2018	ISO 7971-3:2019	USDA (Grain Grading Procedures, Chapter 4 – Corn, October 1, 2020)
Laboratory number	Broken grains, %	Grain impurities, %	Miscellaneous impurities, %	Broken grains, %	Damaged grains, %	Other grains, %	Miscellaneous impurities, %	Bulk density, kg/hl (use of Nilema litre apparatus)	Broken Corn, %
1	-0,30	0,47	0,99	-0,21	0,08	0,33	1,02	0,39	-0,39
2	-0,35	0,35	-0,66						
3									
4	-0,37	0,88	0,47						-0,32
5									
6	0,79	-0,09	0,40	0,32	-0,17	-0,06	0,26		1,39
7	0,96	2,43	0,50	0,78	1,94	0,82	0,28		2,28
8									
9									
10	-0,83	-0,34	-1,32						
11	-0,03	2,56	-0,84						
12									
13									
14	-0,97	-0,79	-0,91					-0,25	
15									
16									
17									
18									
19									
20									
21									
22	0,05	-0,61	0,11	-0,18	-0,48	0,04	0,20		
23									
24									
25									
26	-0,61	0,59	-0,40	-0,65	0,90	0,04	-0,16		-1,65
27	0,14	0,57	0,55						
28									
29									
30									
31									
32	-0,03	-0,40	0,65					-0,01	-0,91
33	-0,01	-0,47	0,52	0,01	0,07	-0,26	-0,32	0,07	0,06
34	-0,03	-0,41	0,42					-0,49	
35									
36									
37	-0,26	0,05	-0,55						
38	-0,35	-0,04	-0,66	-0,51	-0,19	-0,26	-0,37		-0,84
39									
40									
41	0,79	-0,82	0,52	0,46	-0,75	-0,36	-0,11	0,39	0,87
42	0,48	-1,12	0,14						
43									
44									
45									
46									
47									
48									
49									
50	1,30	0,46	-0,22					-0,09	
51	0,25	-0,31	-0,09	0,10	-0,06	0,14	-0,24		0,13

Method	USDA (Grain Grading Procedures, Chapter 4 – Corn, October 1, 2020)	USDA (Grain Grading Procedures, Chapter 4 – Corn, October 1, 2020)	USDA (Grain Grading Procedures, Chapter 4 – Corn, October 1, 2020)	ДСТУ ГОСТ 10840:2019 (ГОСТ 10840–2017, IDT)	ГОСТ 30483-97/ ДСТУ 4525:2006	ГОСТ 30483-97/ ДСТУ 4525:2006	Laboratory choice	Laboratory choice
Laboratory number	Foreign material, %	Damaged kernels, %	Test weight, lbu/bu	Test weight, g/l	Foreign impurities, %	Grain impurities, %	Odour	Colour
1	1,09	0,15	-0,56	-0,14	0,71	-0,36	S	S
2					-0,85	-0,78		
3								
4	0,65	1,68	0,28	1,35			S	S
5					-0,22	-0,48	S	S
6	0,20	1,27	-0,70	-0,30	1,68	0,38	S	S
7	0,38	0,85		1,19	0,55	1,53		
8				0,03	-0,12	-0,75		
9					3,01	1,70	S	
10				-1,30	-0,35	-0,98		
11				-0,97	-0,19	0,11		
12					-0,99	0,46		
13					0,11	0,01		
14				-0,97	-1,52	-1,56		
15				0,03	-0,25	0,06		
16				0,36	-0,12	-0,08		
17				0,62	-0,22	-0,03	S	S
18				-0,47	0,55	0,10		
19					0,08	-0,26		
20				-0,64	-0,25	0,74	S	S
21				-1,13	-0,65	0,67	S	S
22					0,21	0,82	S	S
23				0,29	0,05	-0,60		
24				-0,47	1,35	-0,17		
25				-0,47	1,05	-0,56		
26	0,02	-0,47	0,49	-0,14	-0,82	-0,20	S	S
27				-0,59	1,01	0,48	S	S
28					0,11	-0,70	S	S
29					0,01	-0,22		
30				-0,30	-0,72	1,87		
31					-0,12	-0,90	S	S
32	-0,96	-0,51	1,81	-0,47			S	S
33	-0,78	-0,57	1,93	-0,30			S	S
34							S	S
35				1,40	-1,12	2,10	S	S
36				1,39	0,31	2,35	S	S
37				-0,80	-0,75	-0,85		
38	-0,60	-0,66	-0,56	-0,14	-0,59	-0,55	S	S
39								
40				1,52	1,31	2,10	S	S
41	0,20	-0,54	-0,94	-0,64	0,85	-0,54	S	S
42					-0,12	0,42	S	S
43					0,18	-0,66	S	S
44				0,36	-0,49	-0,22		
45				2,02	0,08	-1,27	S	S
46								
47					0,85	2,28		
48					1,35	1,90		
49				1,85	-0,92	-0,33		
50				0,86	-0,95	0,48	S	S
51	-0,07	-0,51	-0,72	-0,30	0,18	-0,52	S	S

Method	ISO 6540:2021/ ДСТУ ISO 6540:2007	ISO 12099:2017	ISO 20483:2013/ ДСТУ ISO 20483:2016	ISO 16634-2:2016	ISO 12099:2017	ISO 2171:2023/ ДСТУ ISO 2171:2009	ISO 6492:1999/ ДСТУ ISO 6492:2003	ISO 11085:2015	ISO 12099:2017	ISO 6865:2000/ ДСТУ EN ISO6865:2022
Laboratory number	Moisture content, %	Moisture content, %	Crude protein content, % (Expressed on dry matter, factor for converting nitrogen content to protein content - 6.25.)	Crude protein content, % (Expressed on dry matter, factor for converting nitrogen content to protein content - 6.25.)	Crude protein content, % (Expressed on dry matter, factor for converting nitrogen content to protein content - 6.25.)	Ash yield, % (Expressed on dry matter)	Fat content, % (Expressed as a mass fraction of the product as received)	Fat content, % (Expressed as a mass fraction of the product as received)	Fat content, % (Expressed as a mass fraction of the product as received)	Crude fibre content, % (Expressed as a mass fraction of the product as received)
1	0,25	0,67	-0,01		0,28	-1,11	0,44	-0,20	-0,32	1,53
2	0,17		-0,44			-0,27	0,66			0,30
3										
4	-0,18	-9,77	0,71		-1,02	-0,27	0,07		-9,64	1,22
5										
6	0,01	0,67	-1,08		-0,09	0,56	1,68		2,67	-1,78
7	0,44									
8										
9										
10	-0,79									
11	-0,65									
12										
13										
14	0,12	0,12			-0,01				-0,32	
15										
16										
17	-0,76									
18										
19										
20										
21										
22	-0,10									
23	-0,02			0,26						
24										
25										
26	0,50		-2,08			-0,27		1,71		
27	0,17									
28										
29										
30										
31										
32	0,12		0,71			-0,48	-0,58	-0,48		0,14
33	-0,10		0,71			0,14	-0,44	-0,29		0,14
34	-0,05		0,56			0,56		-3,94		-0,24
35										
36										
37	0,28		-0,72			0,14	0,51			0,30
38	0,31		-0,58			-0,07				
39	-1,47	-1,31	3,06		0,88	0,35	-0,29		-0,05	0,91
40										
41	0,61	0,67	-0,36		-0,18	0,35	0,73	1,26	0,68	-1,47
42	-0,07									
43										
44										
45	0,34									
46						-0,07	-0,80			
47	-3,05									
48	-1,91									
49				-0,26			-1,46			0,03
50	0,06		0,49			-0,07	-0,29			-1,32
51	0,44	0,64								

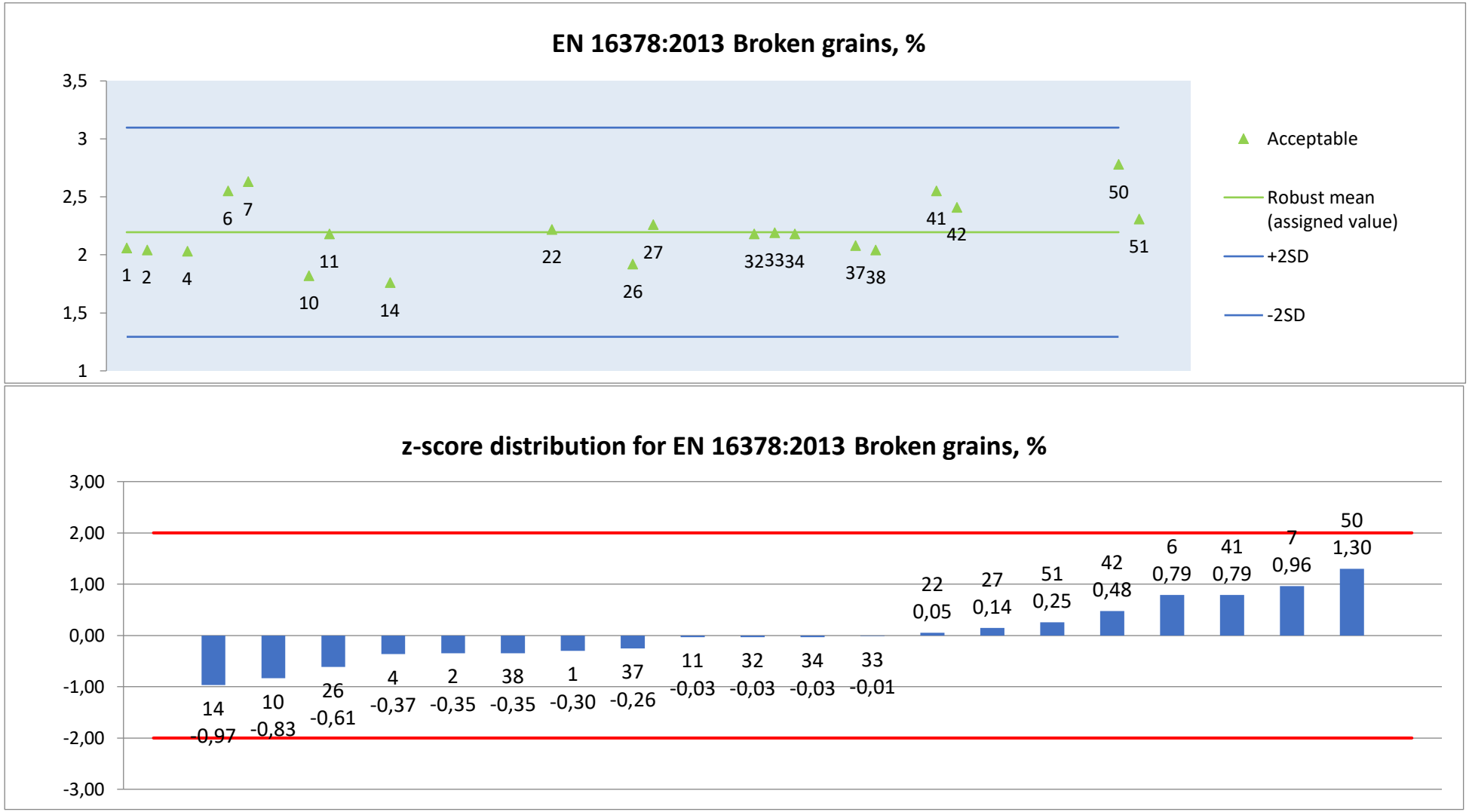
Method	ISO 12099:2017	ISO 6493:2000	ISO 12099:2017	GAFTA 7.0:2018	ГОСТ 13586.5-93	ДСТУ 4117:2007	ДСТУ 7169:2010	ГОСТ 13496.15-97	ДСТУ 8844:2019	ГОСТ 10845-98
Laboratory number	Crude fibre content, % (Expressed as a mass fraction of the product as received)	Starch content, %	Starch content, %	Volatile nitrogenous basis, %	Moisture content, %	Moisture content, %	Mass fraction of crude protein, % (Expressed on dry matter, factor for converting nitrogen content to protein content - 6.0.)	Mass fraction of crude fat, % (Expressed on dry matter)	Mass fraction of crude fibre, % (Expressed on dry matter)	Starch content, % (Expressed on dry matter)
1	1,36	-0,45	0,61	-1,29	0,58	0,15	0,10	0,86		0,71
2					0,31		-0,46			
3					0,78		-0,29	-0,68	0,71	
4					-0,17	-9,12	0,45	0,54	-0,46	
5					0,08	0,10				
6	-1,52				-0,08	0,15	-0,90	1,10	-1,70	
7					0,08	-0,12				
8					0,08	0,15				
9					0,36					
10					-0,75	0,01				
11					-0,44	-0,18				
12					-0,28	-0,18				
13					0,08	0,43				
14					0,08	0,23				
15					0,08					
16					0,36					
17					0,08					
18						0,15				
19						-0,40				
20					0,78	1,12				
21					0,36	1,26				
22					-0,19	-0,12				
23					-0,14					
24					0,08					
25					0,36		0,32	-0,44	1,33	-0,71
26	-0,61	-10,88			0,45					
27					-0,75	0,15				
28					-0,06	-0,12				
29					0,36					
30					0,08	-0,40				
31					-0,19	-0,12				
32					-0,75			-0,44		
33					-0,89			-0,27		
34										
35					-1,58	-2,34	-0,33	-0,76		
36					-0,19	-0,60				
37					0,36		-0,55			
38					0,28	0,15				
39	0,76	-0,21	-0,61		-0,81	-0,79	1,68	-0,03	0,78	-1,54
40					-0,19	0,71				
41		0,66		1,29	0,25		-0,33	1,02	-0,53	
42					-0,19					
43					0,36	0,43				
44					0,36		0,28	-1,73	0,64	
45					0,36	1,26				
46					-0,75		2,46		-0,98	
47					-0,47	-0,12				
48					-0,47	-0,96				
49					-1,03					
50					0,08			0,21		
51					0,36	0,21				

Remarks

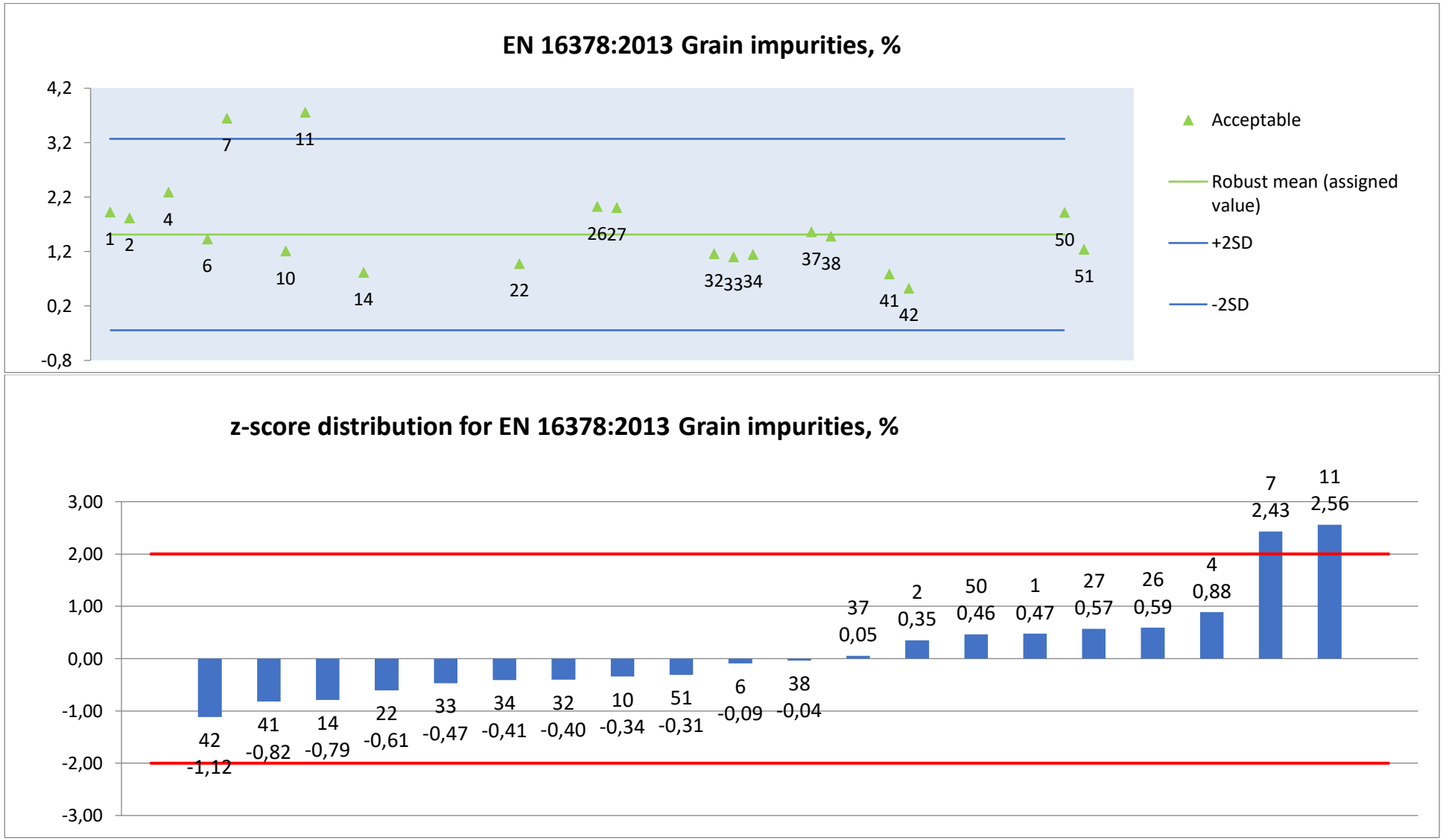
1. Green colored cells contain results that are considered to be satisfactory.
2. Red colored cells contain results that are considered to be not satisfactory.
3. Results that are considered to be questionable are marked by yellow colored cell.
4. Blank cell – results were not reported by the Participant

8. Z SCORE PLOTS AND RESULTS CHARTS.

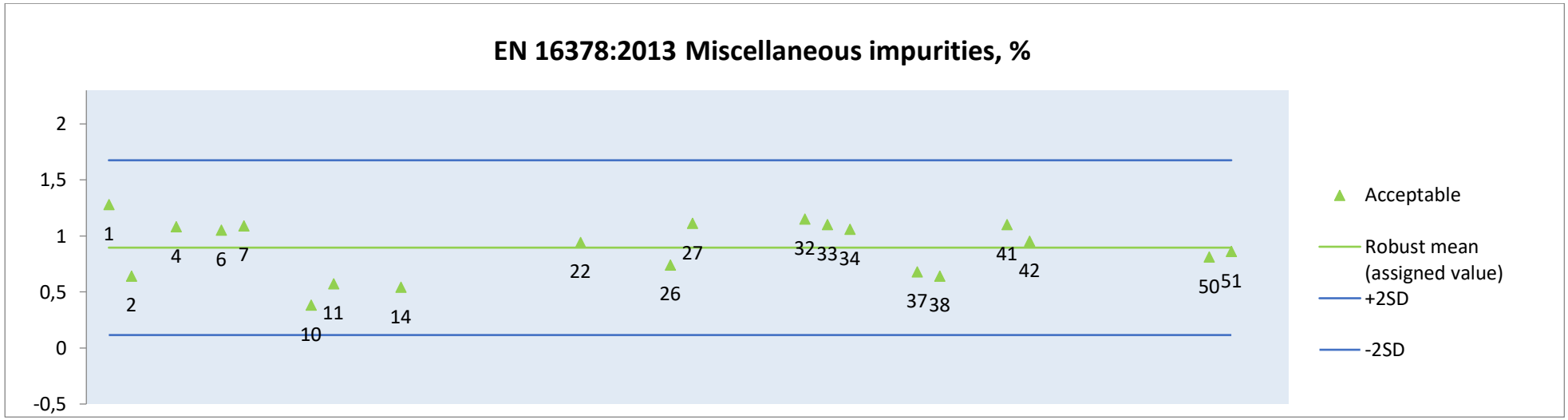
8.1. EN 16378:2013 Broken grains, %

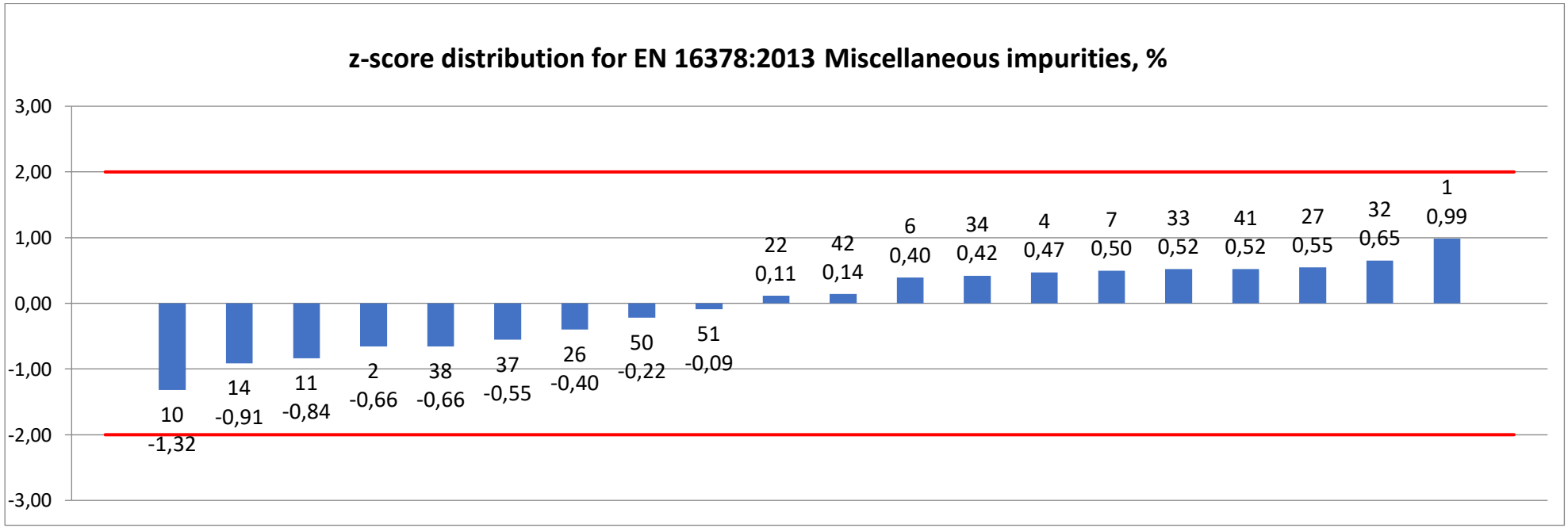


8.2. EN 16378:2013 Grain impurities, %

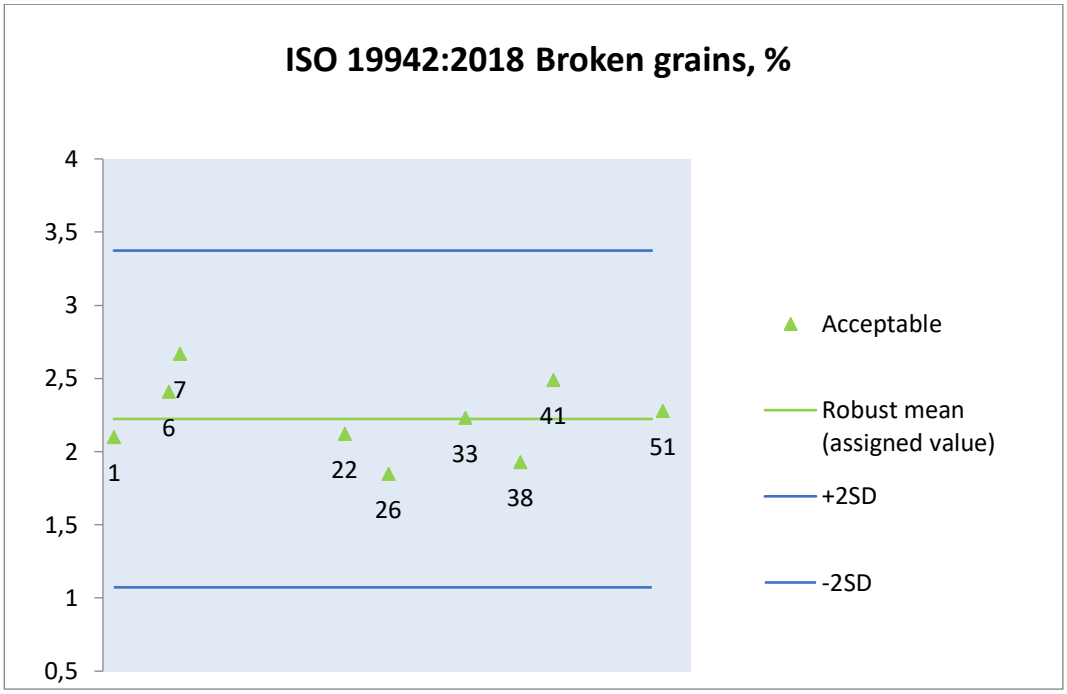


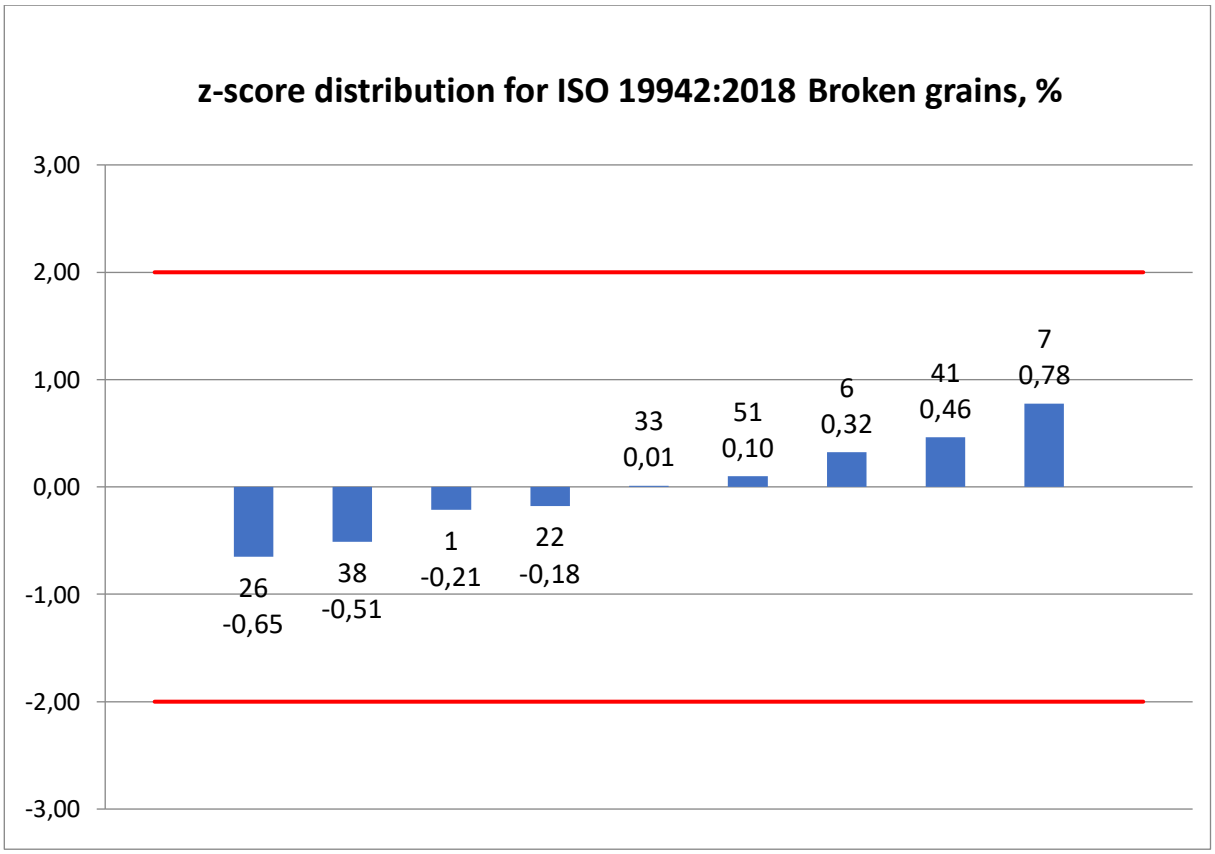
8.3. EN 16378:2013 Miscellaneous impurities, %



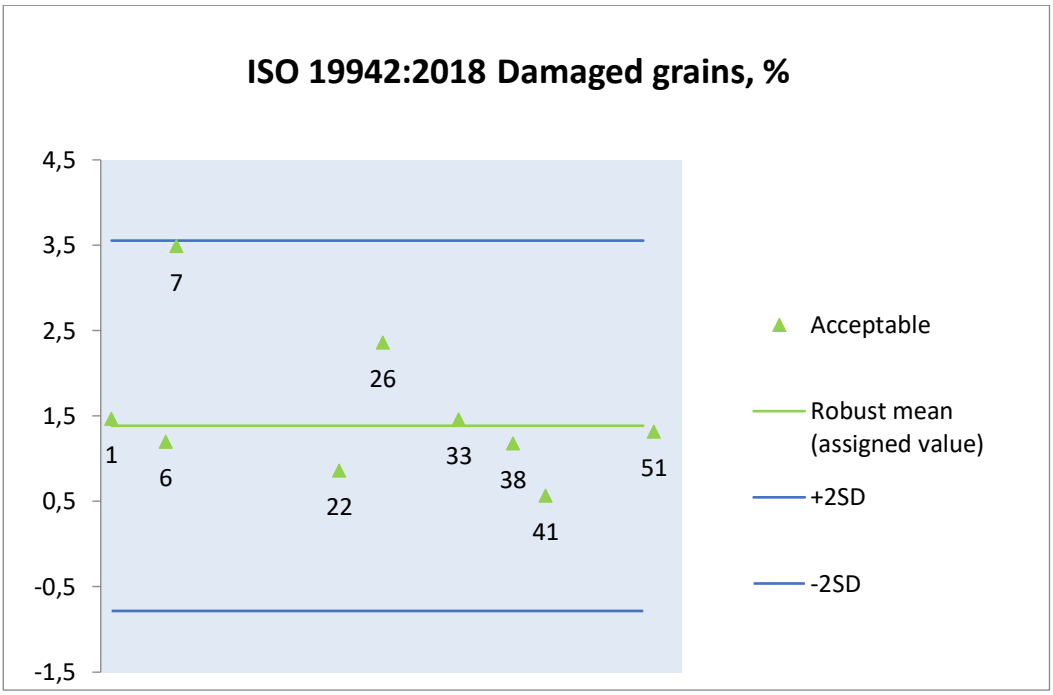


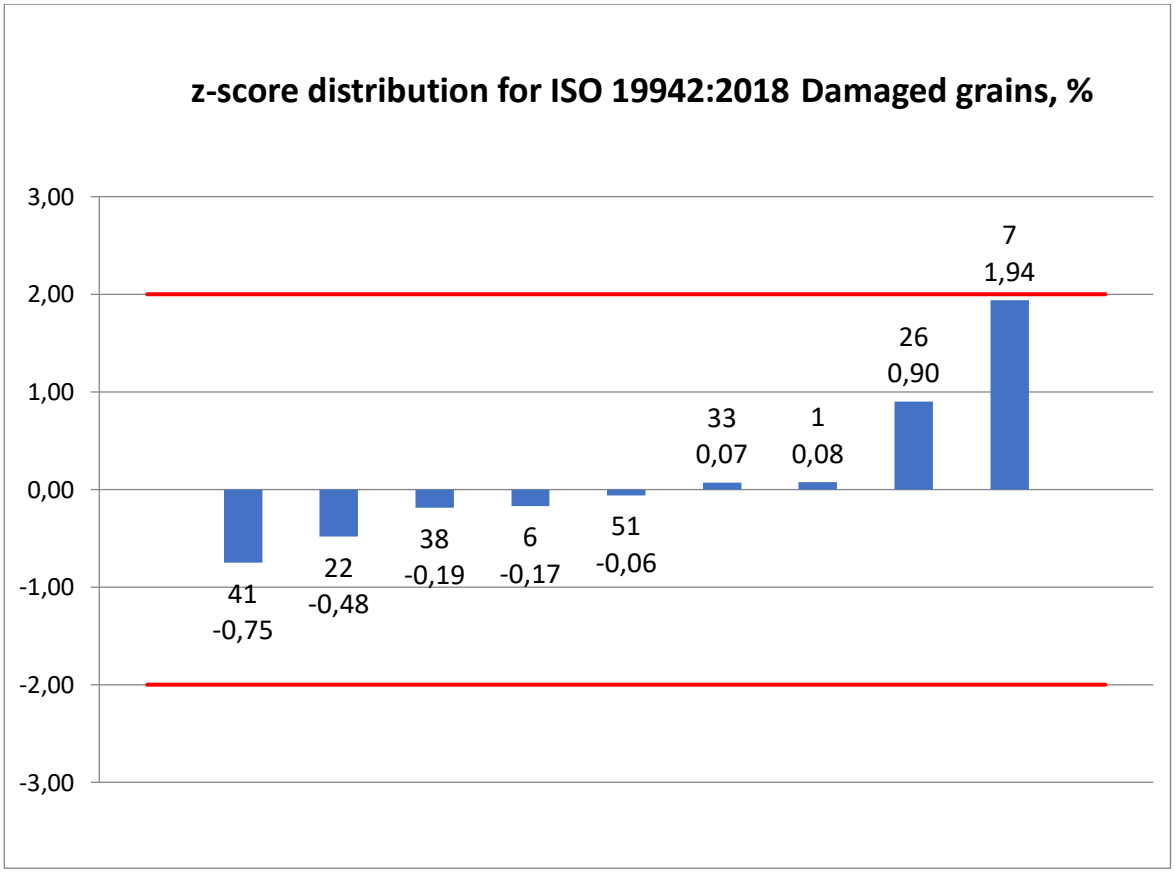
8.4. ISO 19942:2018 Broken grains, %



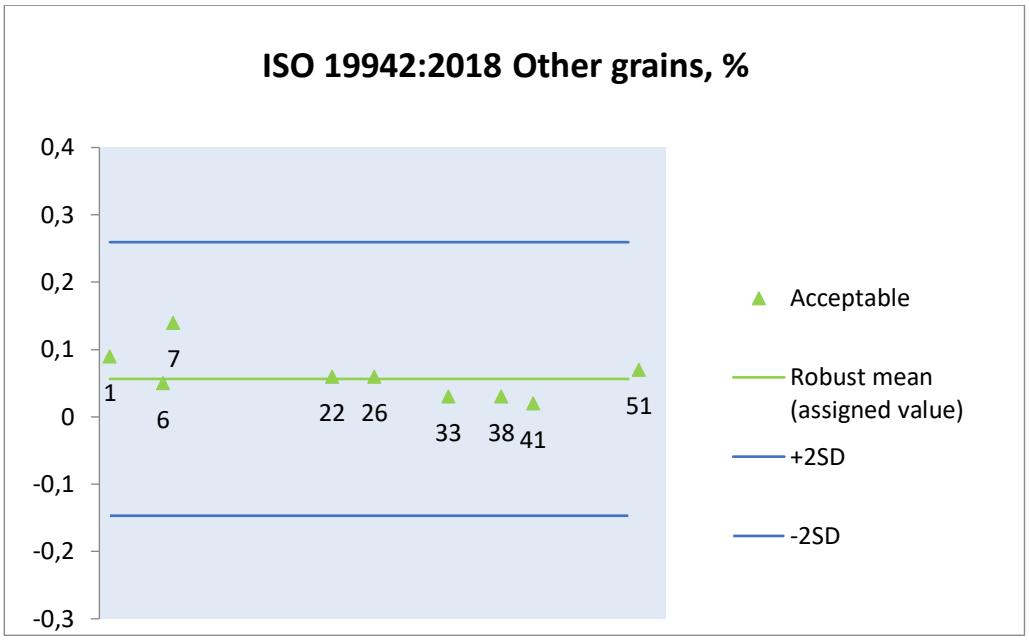


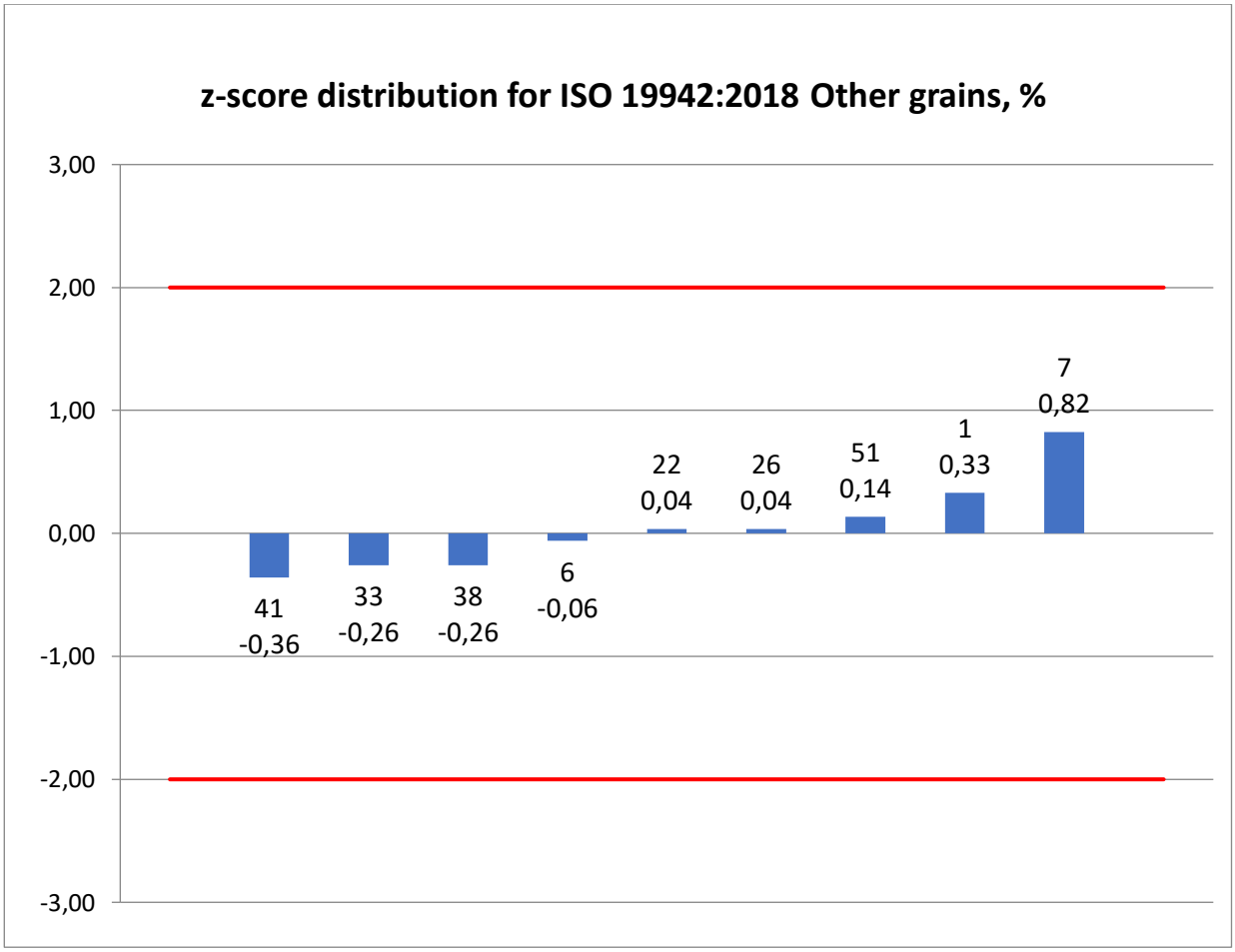
8.5. ISO 19942:2018 Damaged grains, %



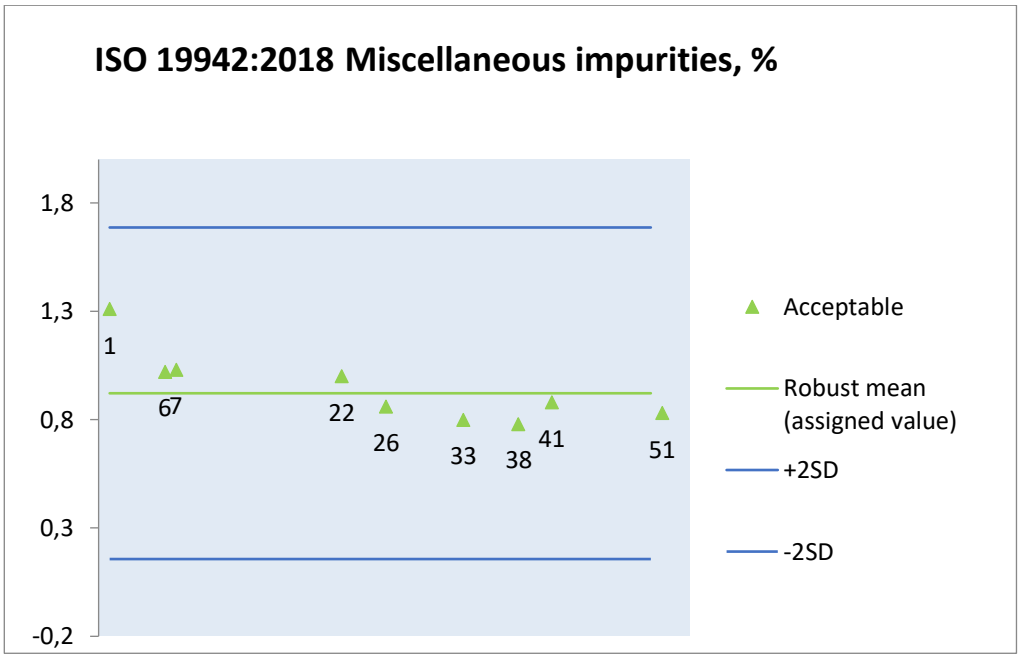


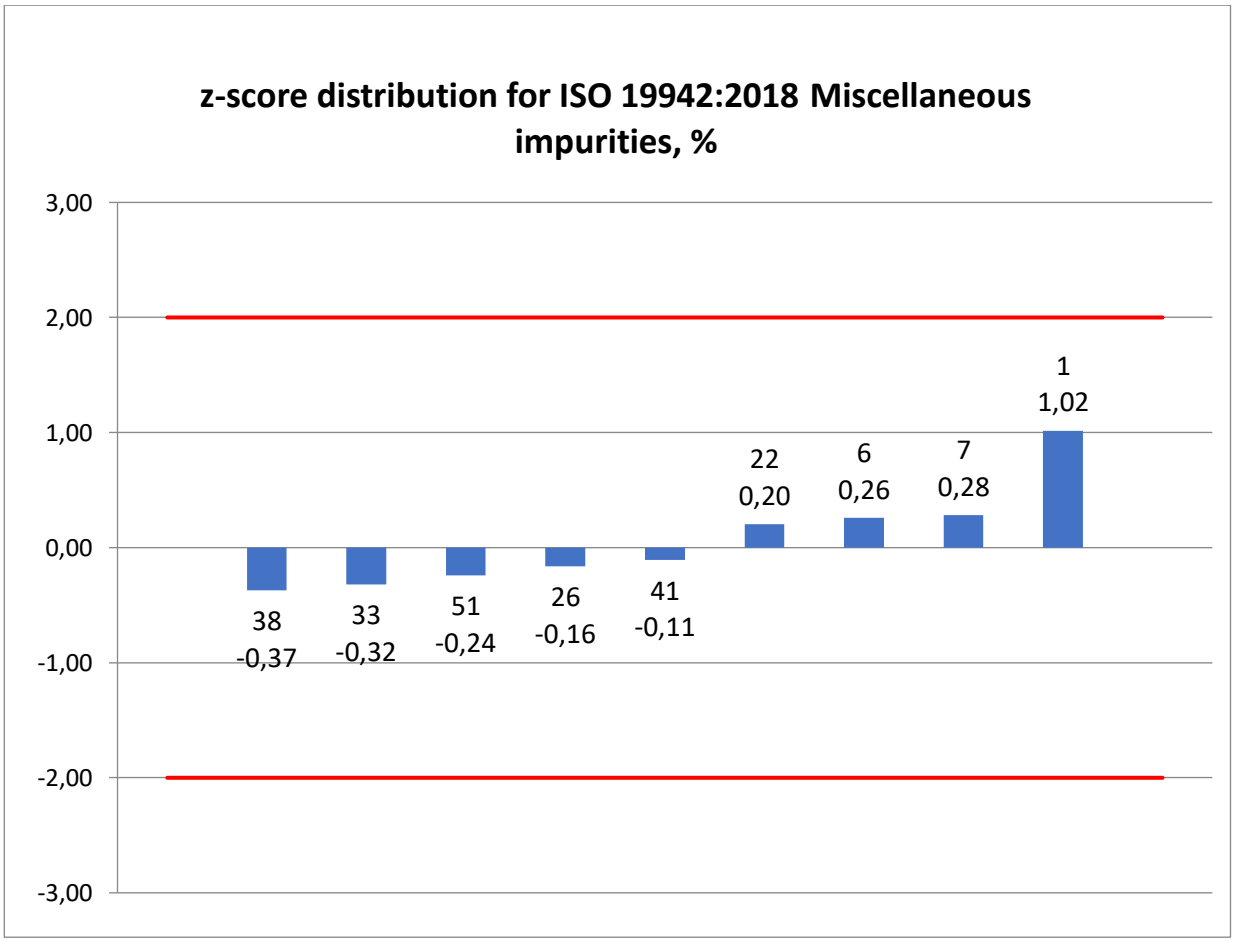
8.6. ISO 19942:2018 Other grains, %



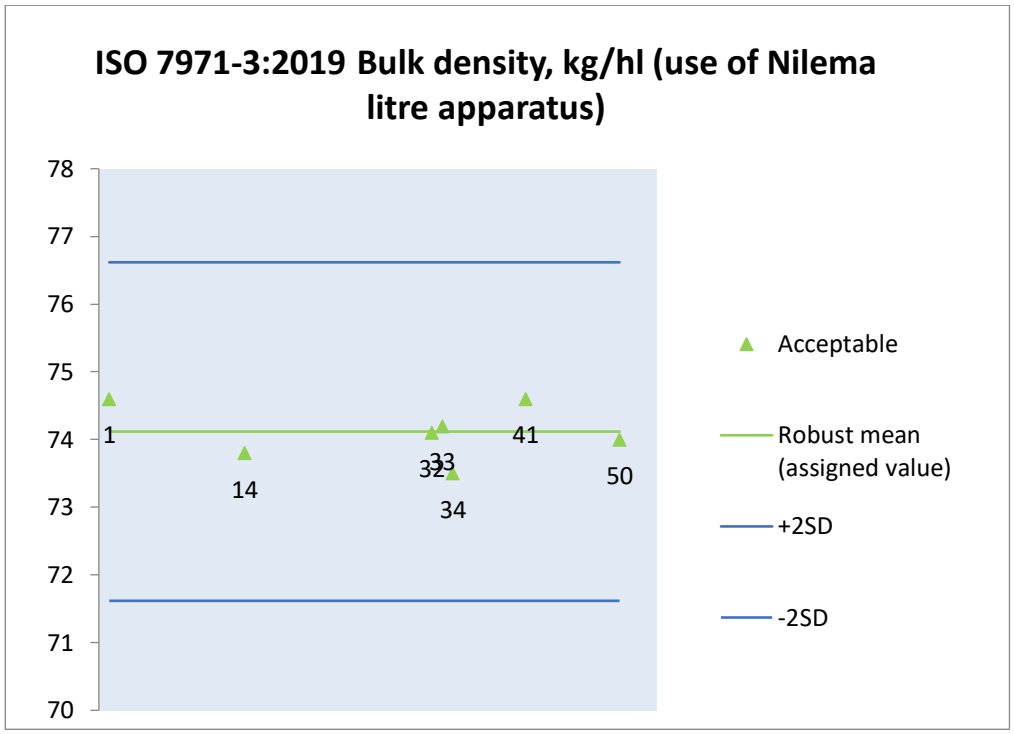


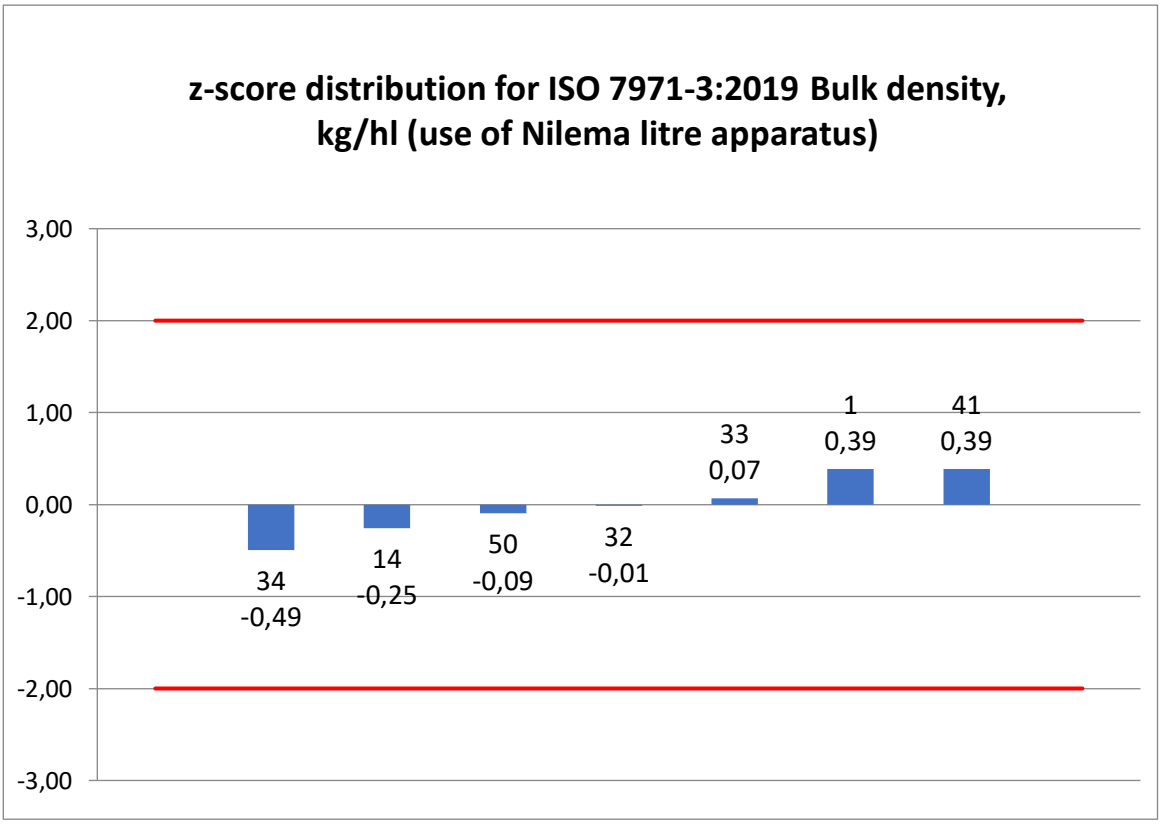
8.7. ISO 19942:2018 Miscellaneous impurities, %



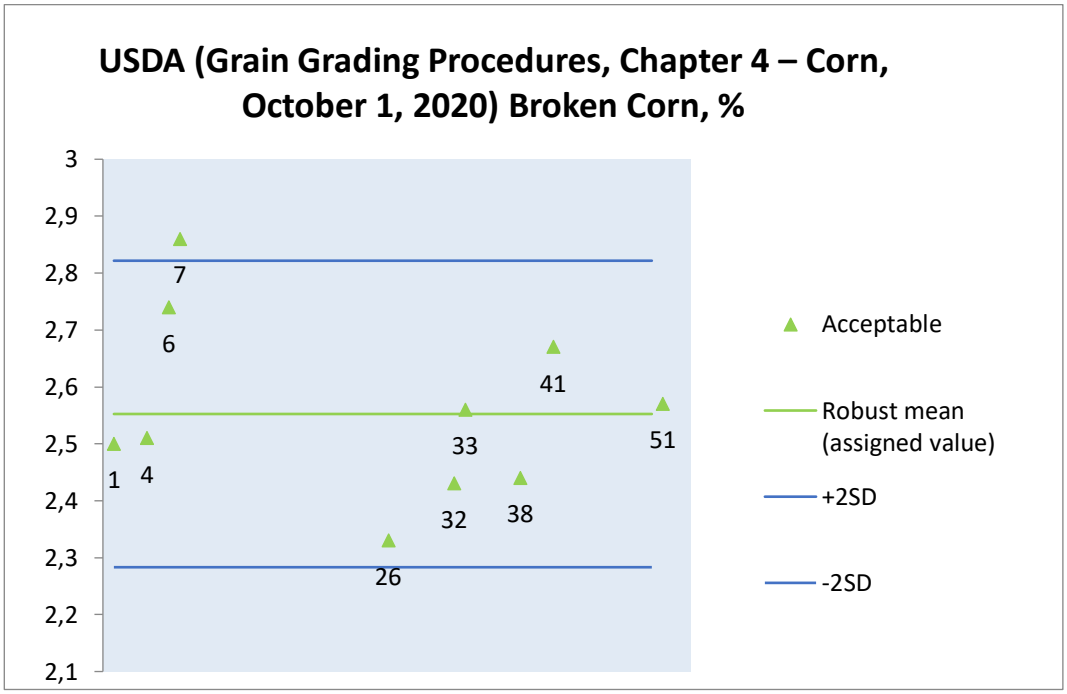


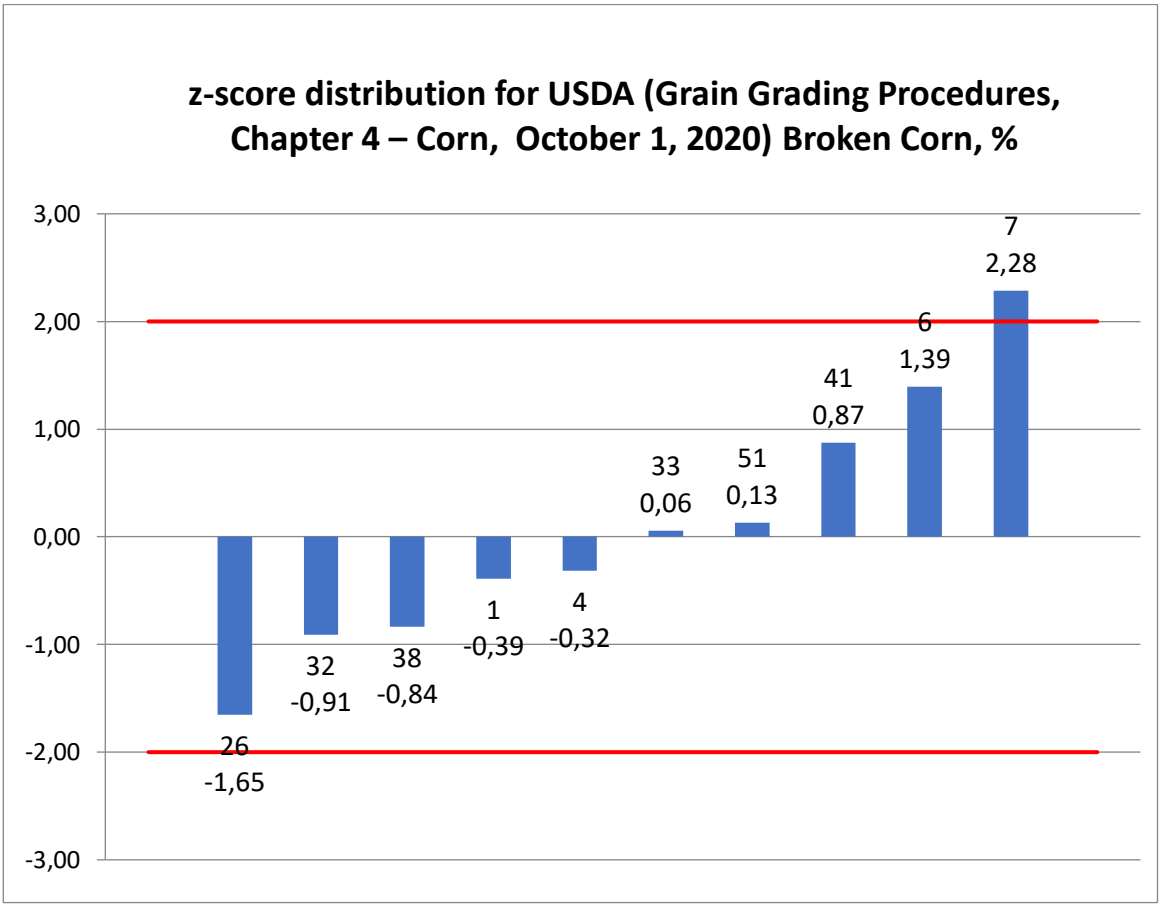
8.8. ISO 7971-3:2019 Bulk density, kg/hl (use of Nilema litre apparatus)



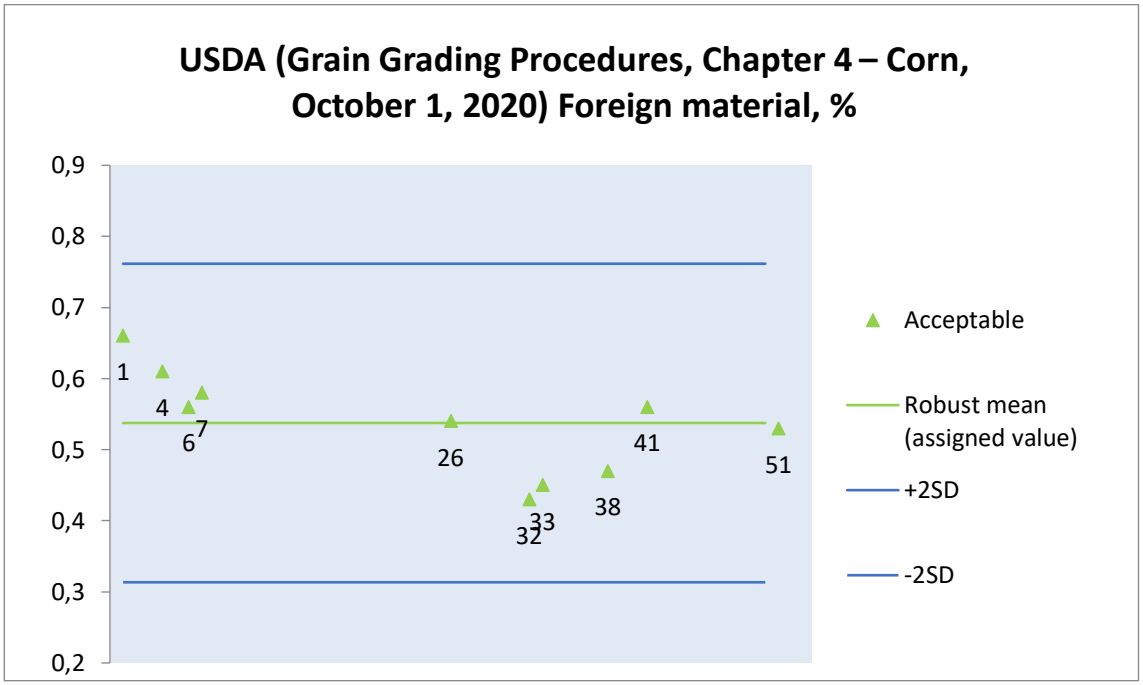


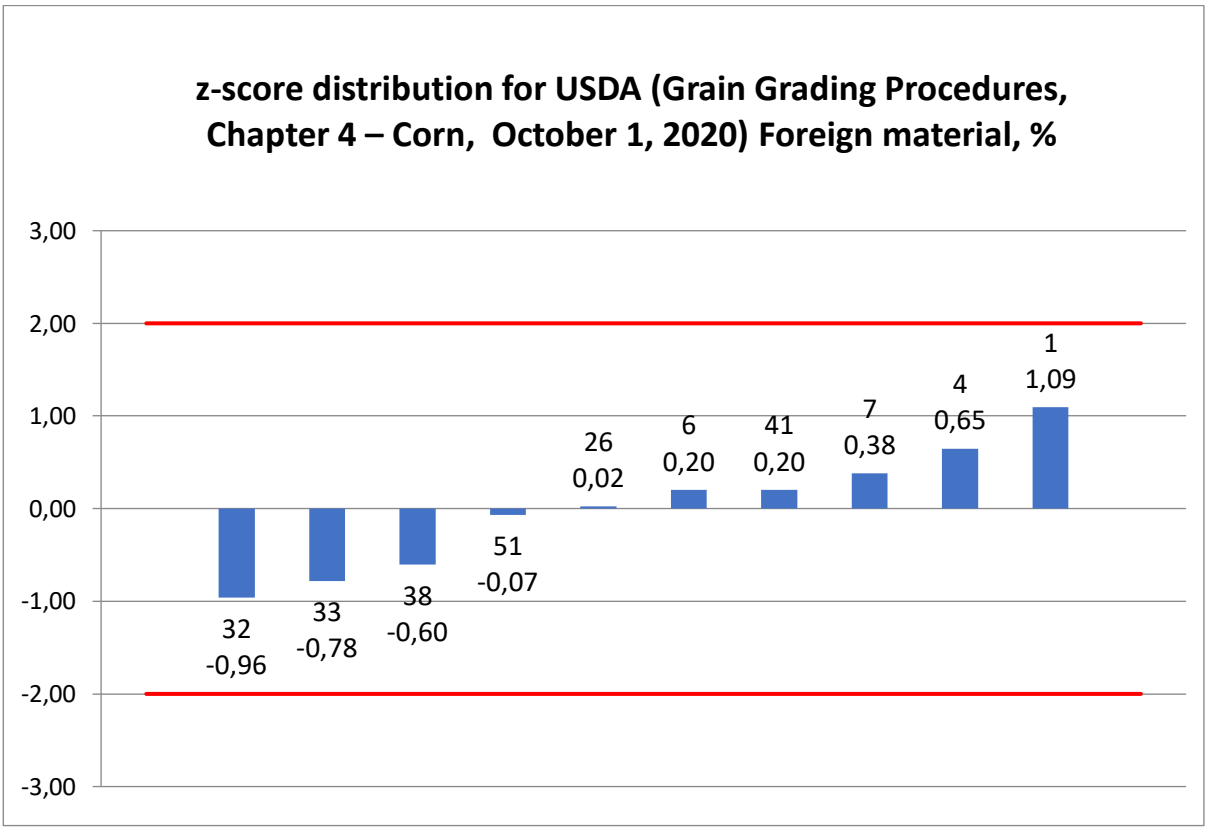
8.9. USDA (Grain Grading Procedures, Chapter 4 – Corn, October 1, 2020) Broken Corn, %



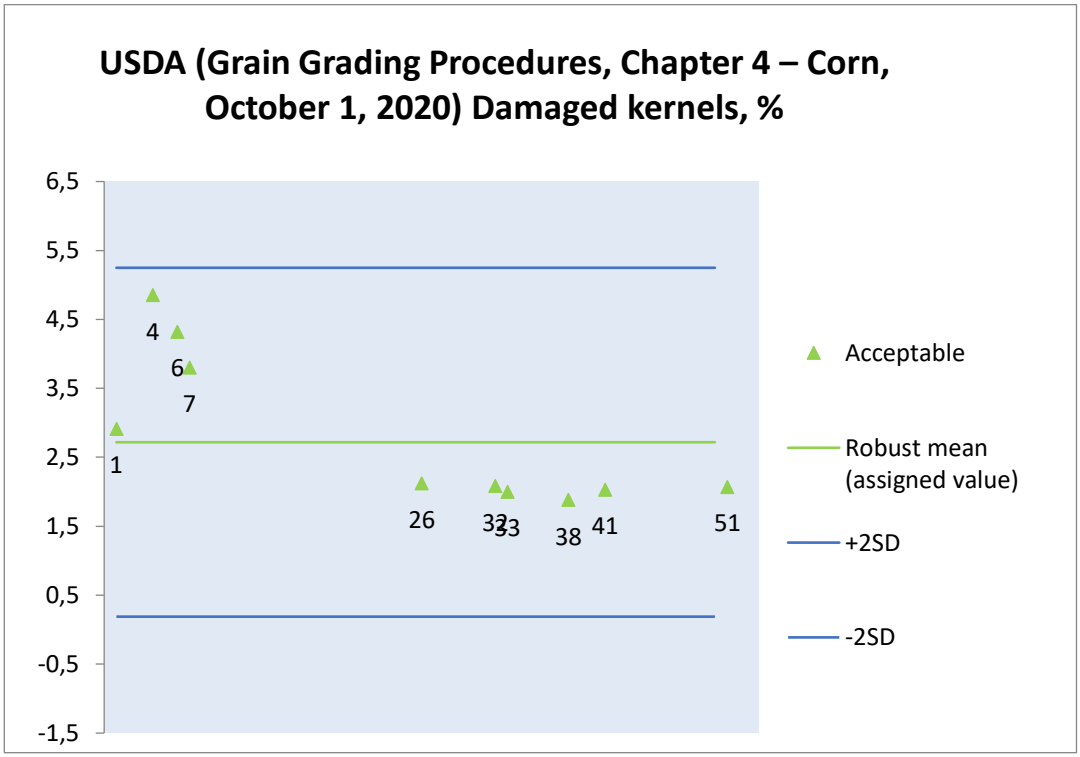


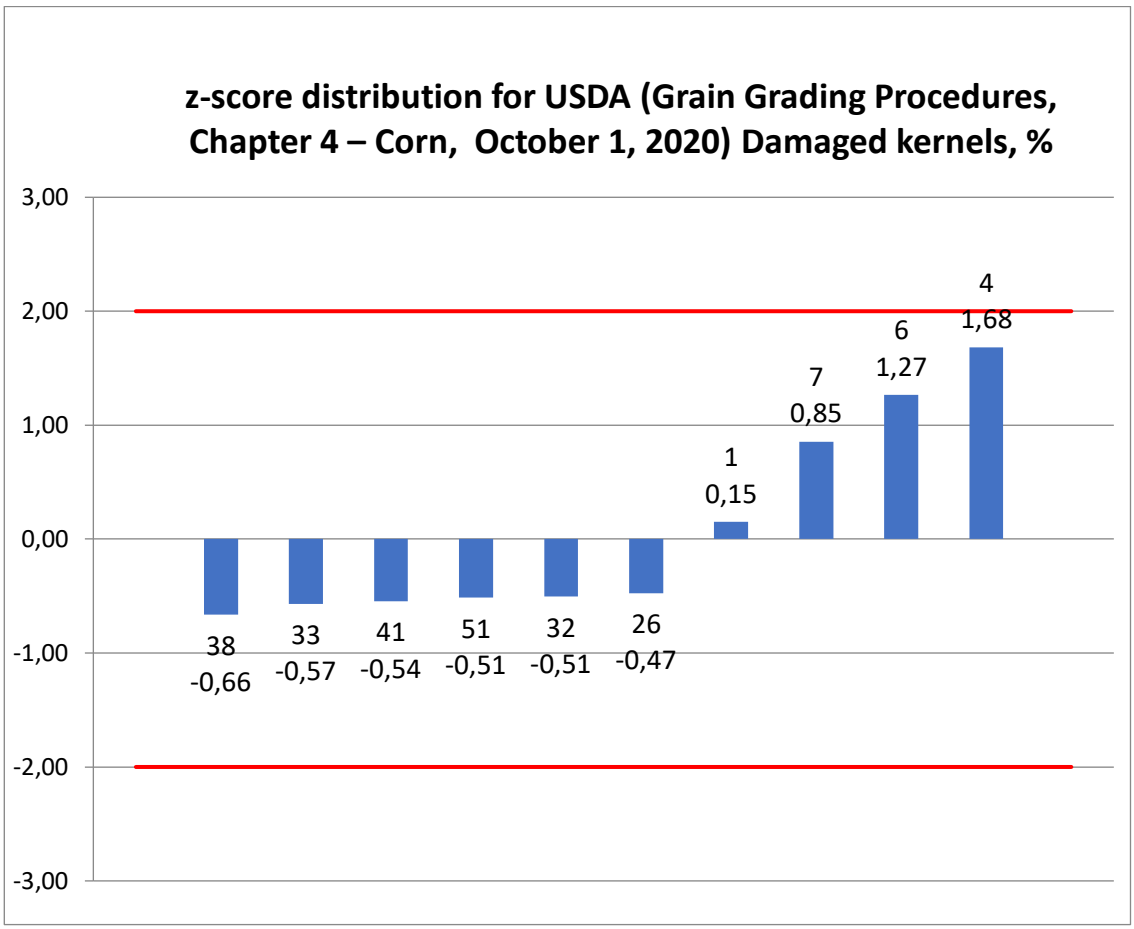
8.10. USDA (Grain Grading Procedures, Chapter 4 – Corn, October 1, 2020) Foreign material, %



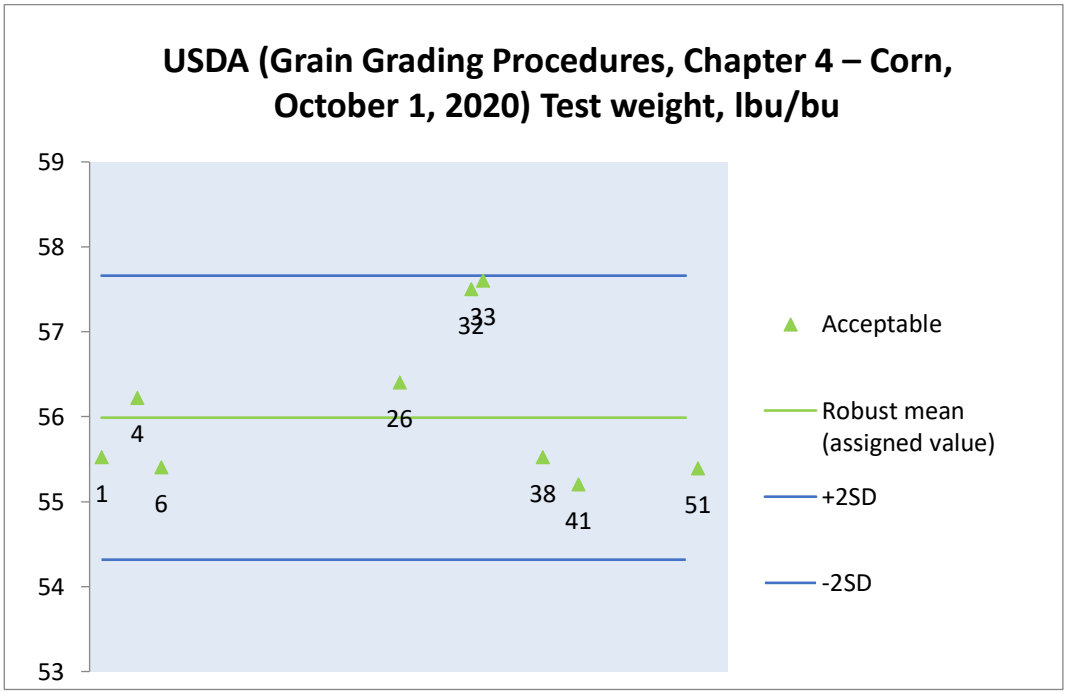


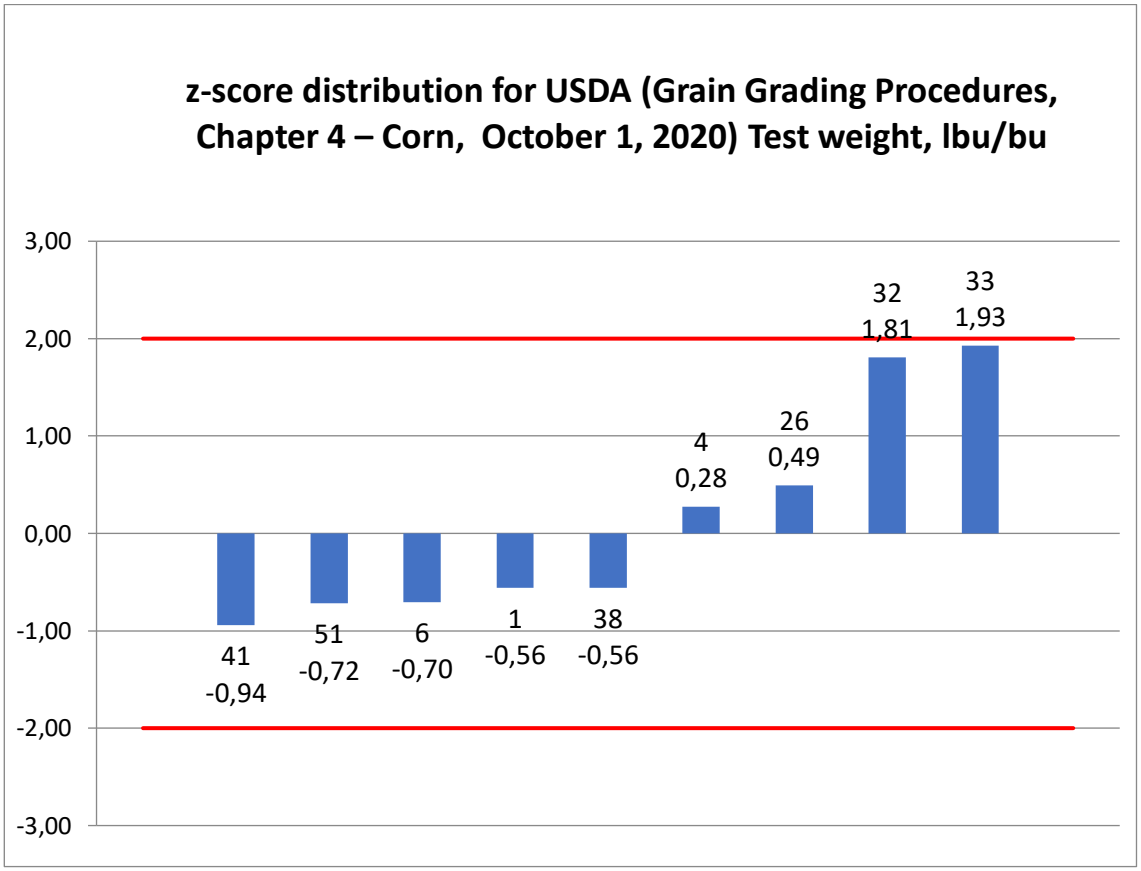
8.11. USDA(Grain Grading Procedures, Chapter 4–Corn,October 1,2020) Damaged kernels, %



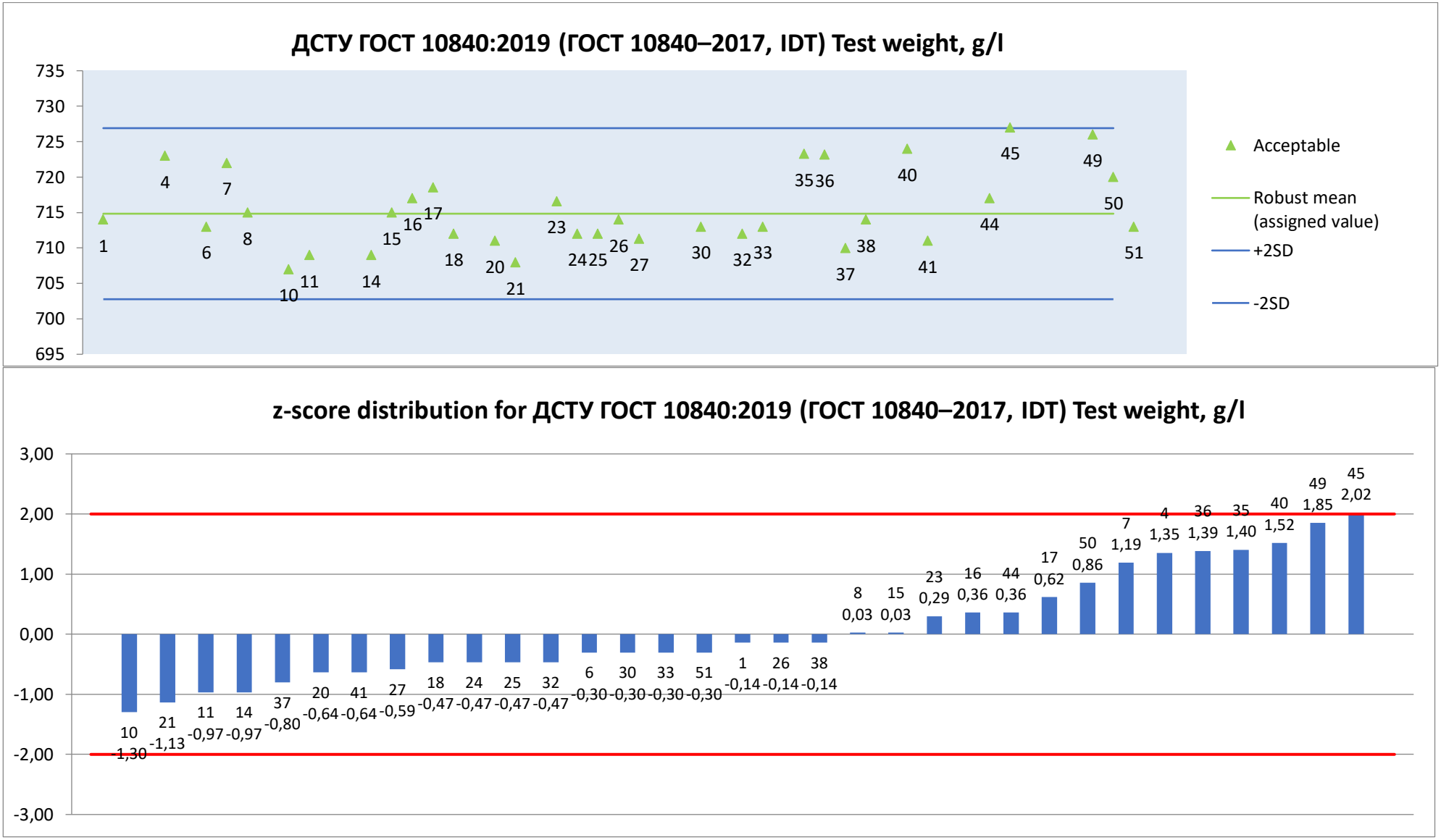


8.12. USDA (Grain Grading Procedures, Chapter 4 – Corn, October 1, 2020) Test weight, lbu/bu

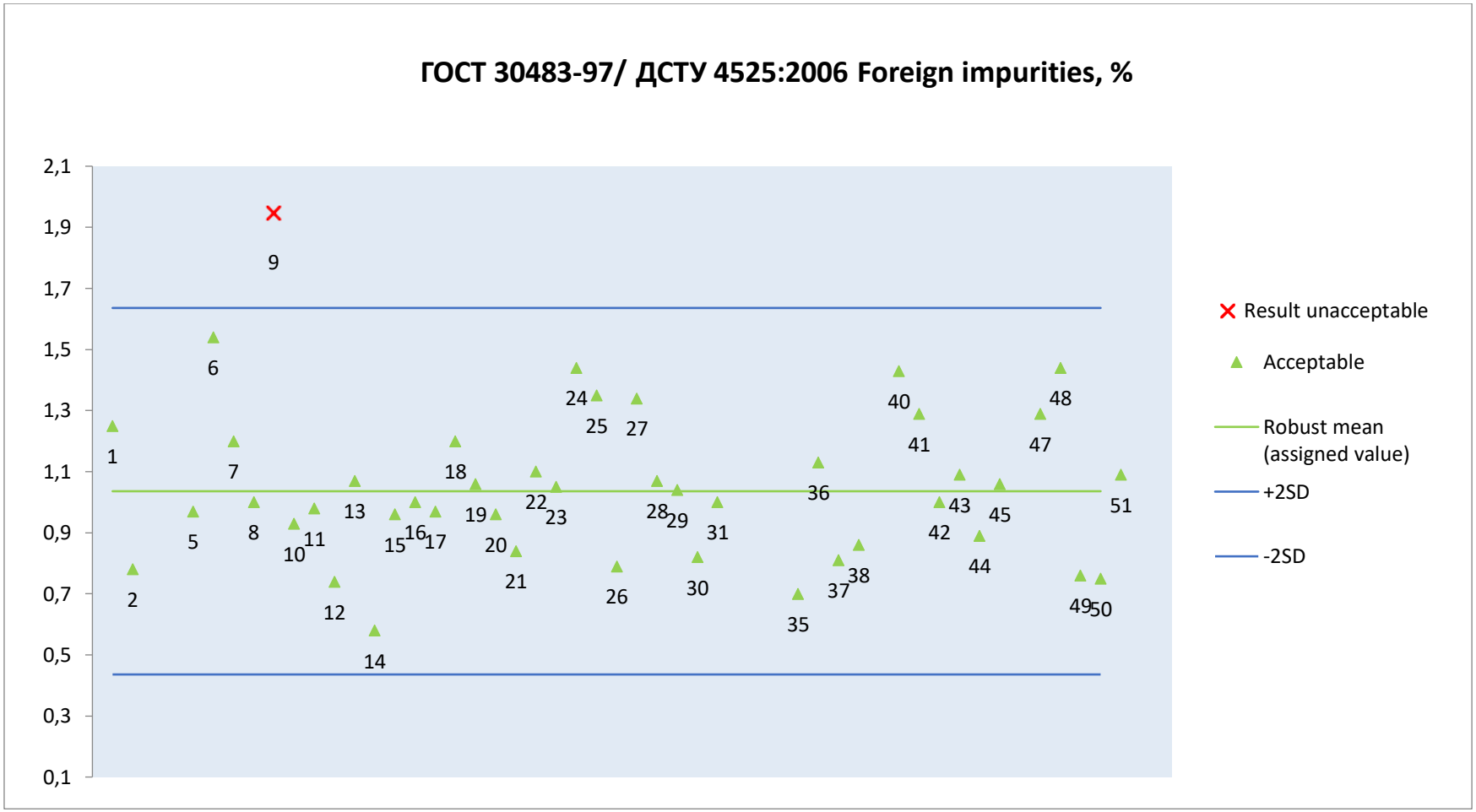


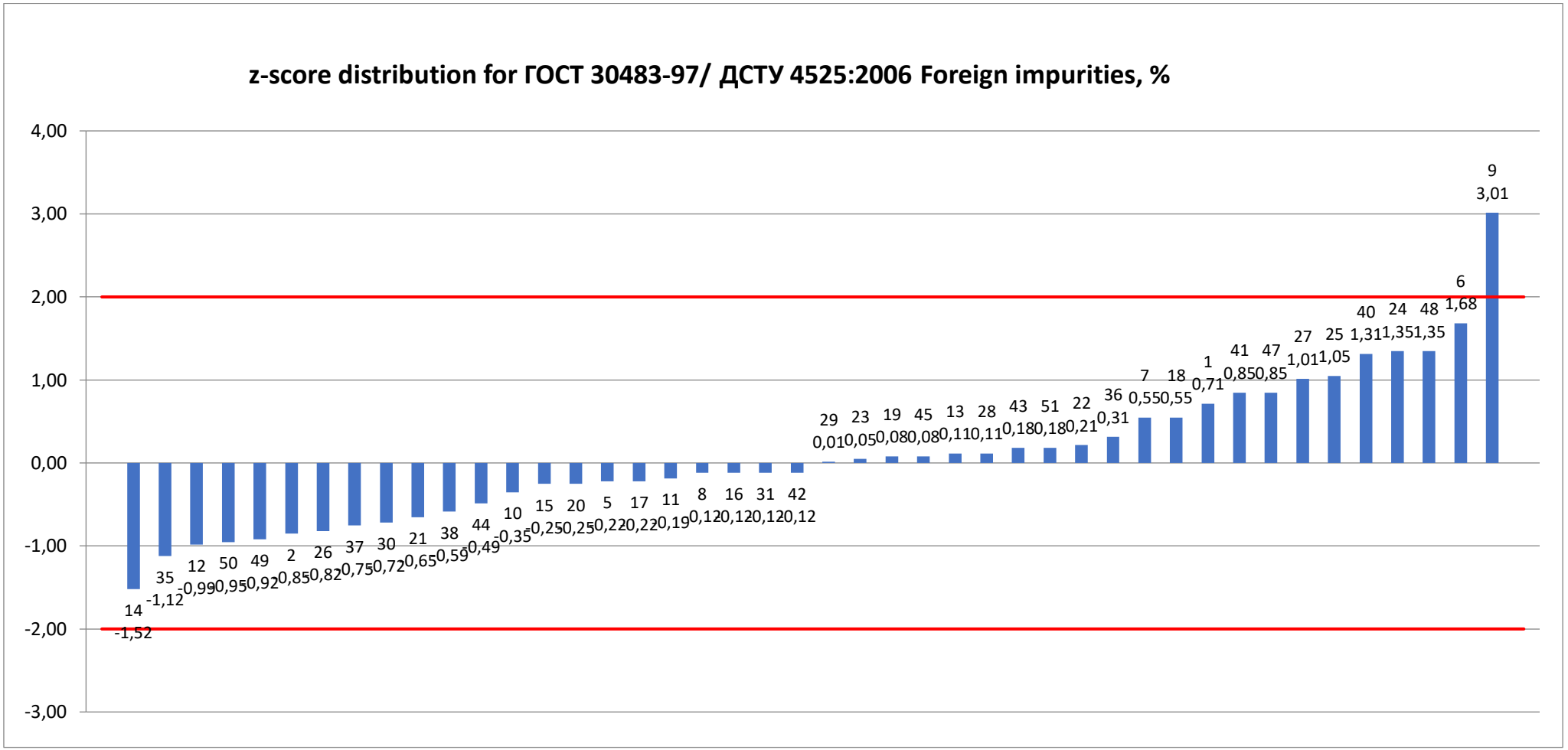


8.13. ДСТУ ГОСТ 10840:2019 (ГОСТ 10840–2017, IDT) Test weight, g/l

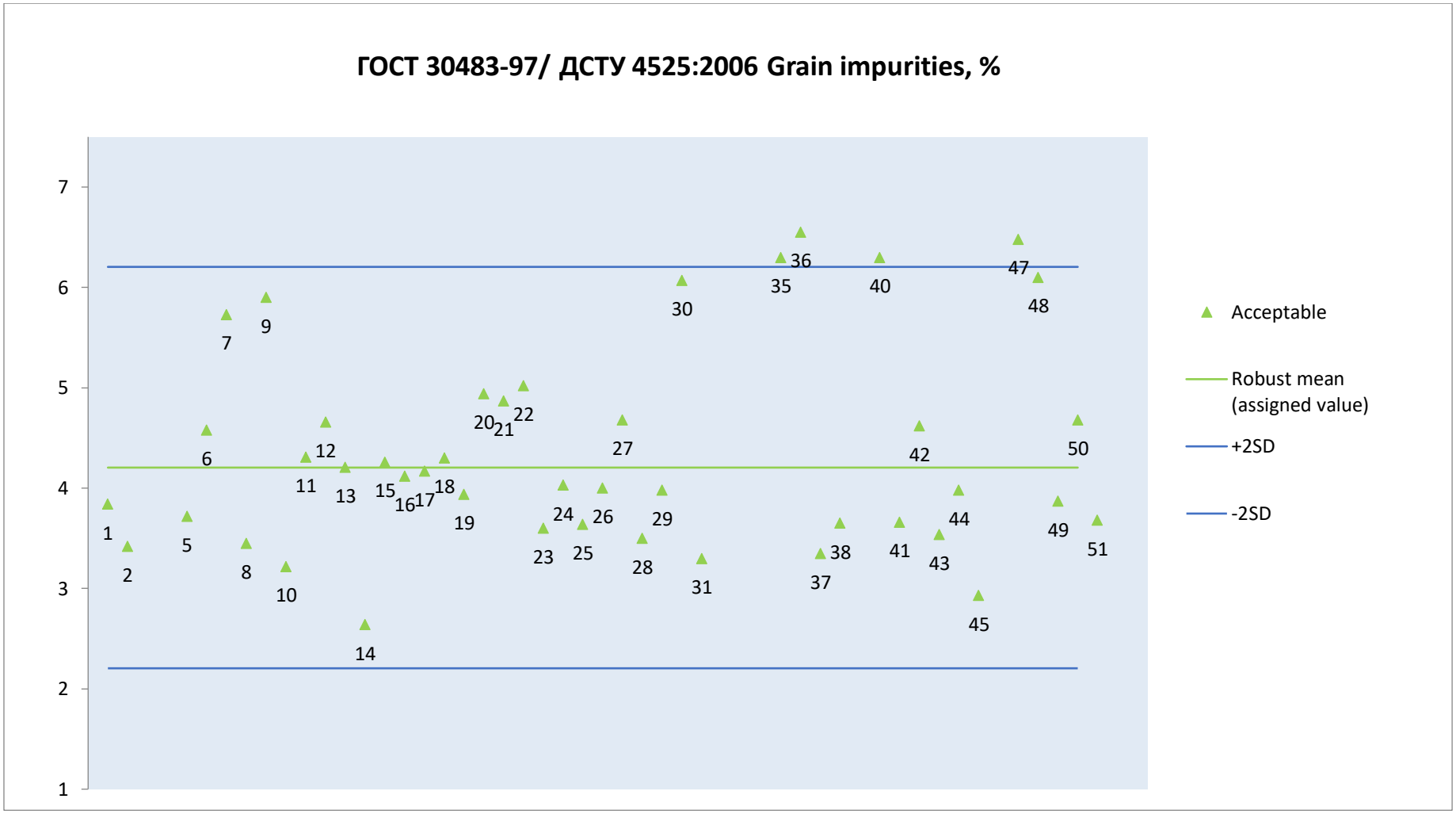


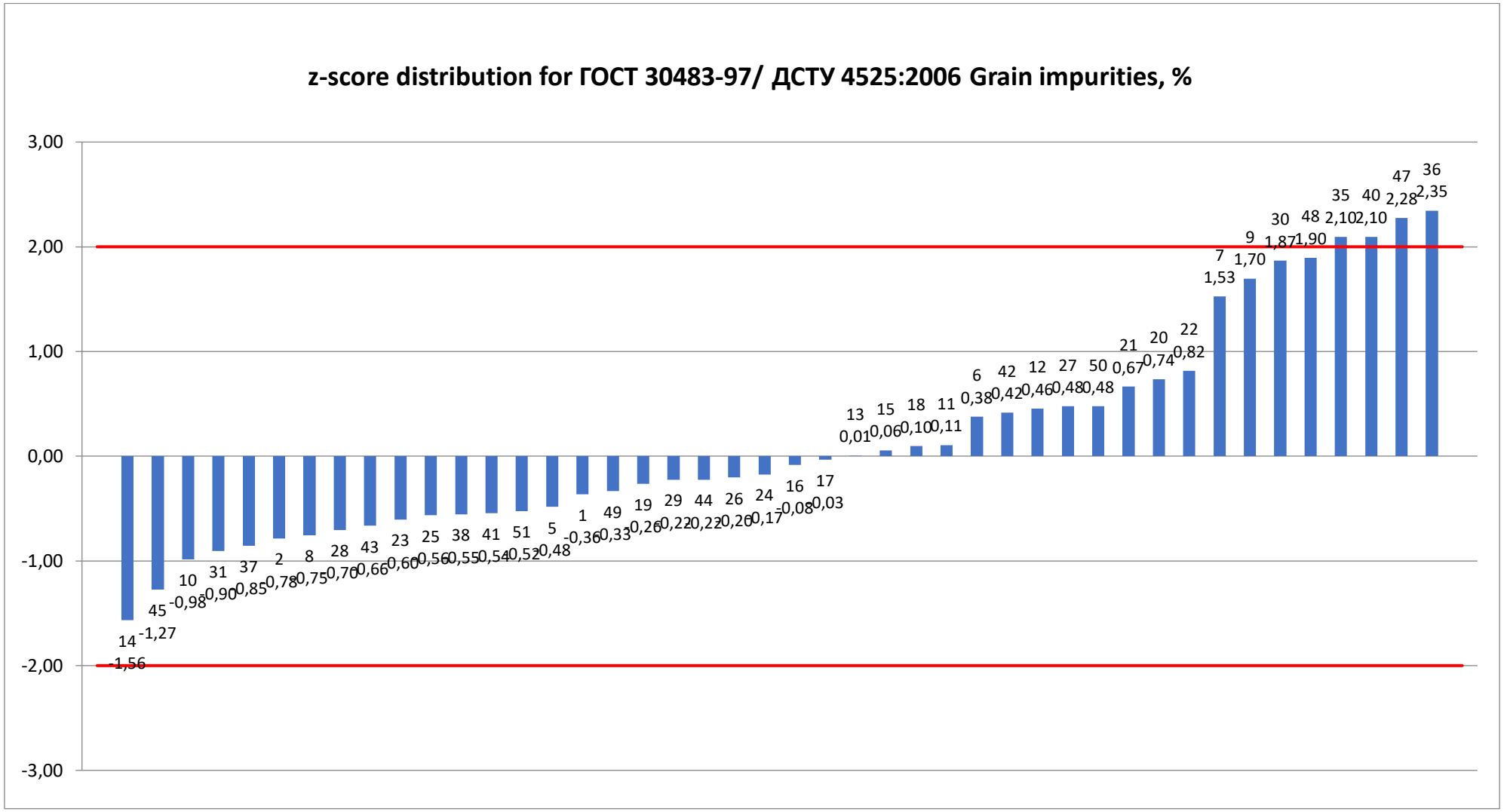
8.14. ГОСТ 30483-97/ ДСТУ 4525:2006 Foreign impurities, %



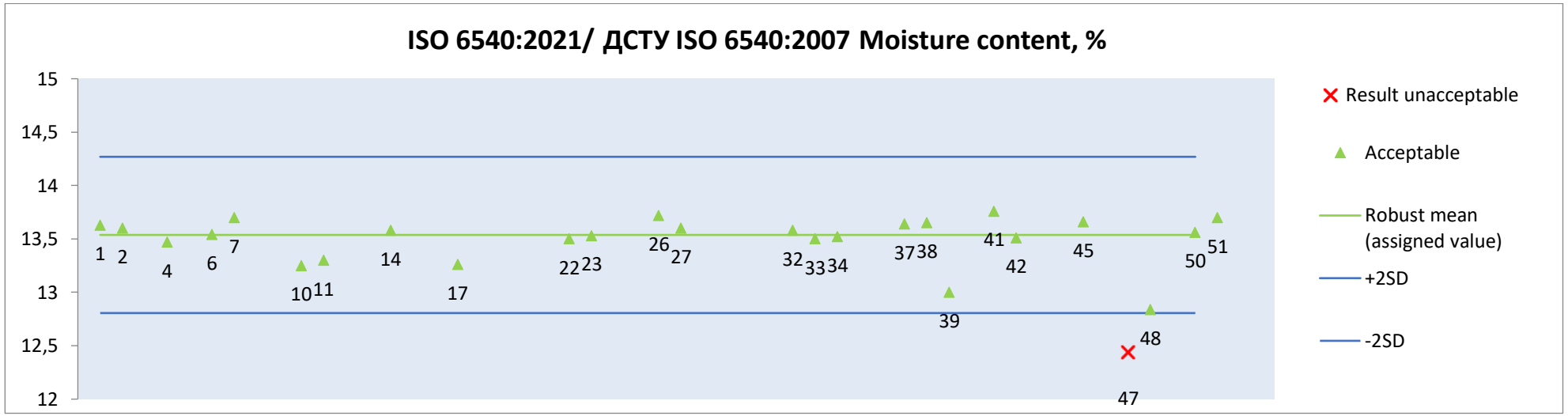

z-score distribution for ГОСТ 30483-97/ ДСТУ 4525:2006 Foreign impurities, %
4,00
3,00
2,00
1,00
0,00
-1,00
-2,00
-3,00
14 -1,52
35 -1,12
12 -0,99
50 0,95
49 0,92
2 0,85
26 0,82
37 0,75
30 0,72
21 0,65
38 0,59
44 -0,49
10 -0,35
15 -0,25
20 0,25
5 0,22
17 0,22
11 0,19
8 0,12
16 0,12
31 0,12
42 0,12
29 0,01
23 0,05
19 0,08
45 0,08
13 0,11
28 0,11
43 0,18
51 0,18
22 0,21
36 0,31
7 0,55
18 0,55
1 0,71
41 0,85
47 0,85
27 1,01
25 1,05
40 1,31
24 1,35
48 1,35
6 1,68
9 3,01

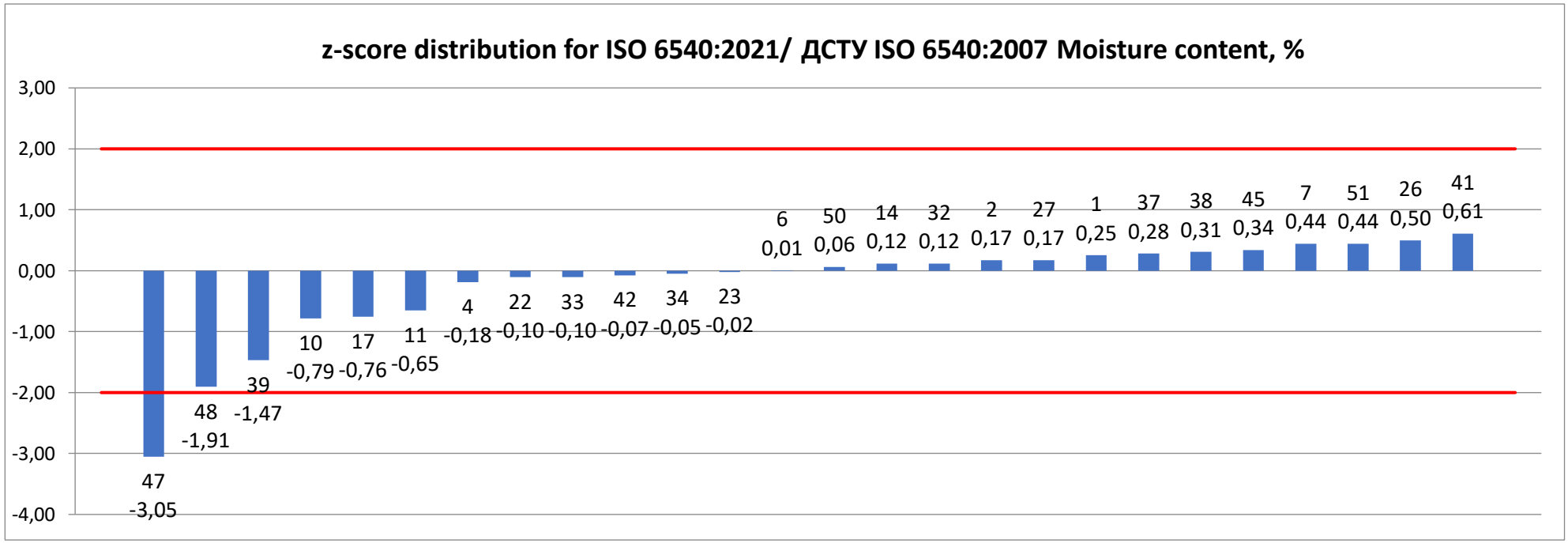
8.15. ГОСТ 30483-97/ ДСТУ 4525:2006 Grain impurities, %



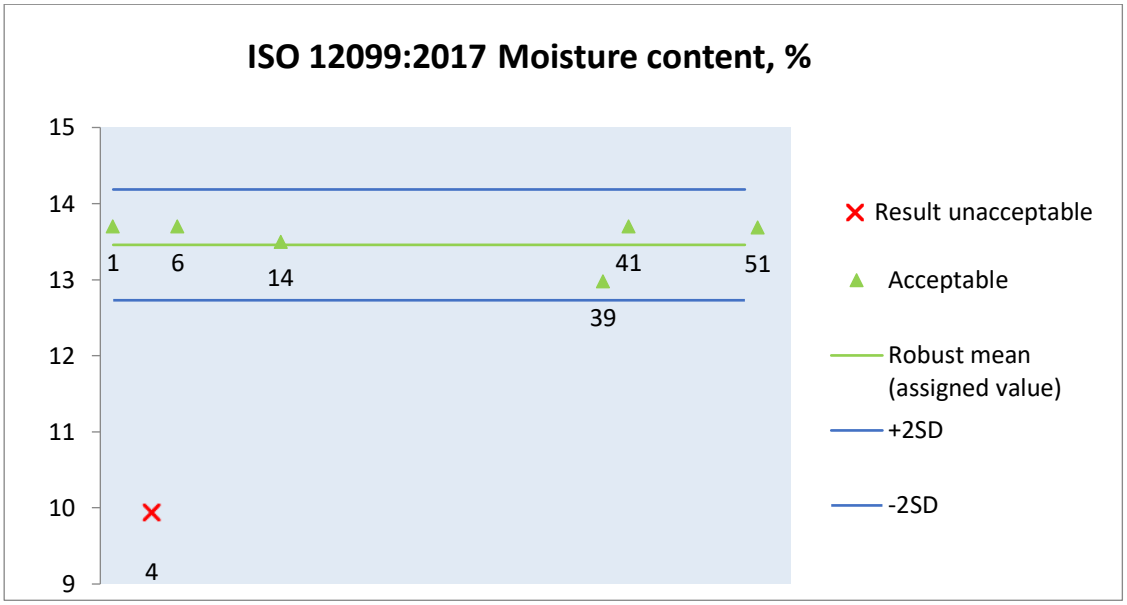

z-score distribution for ГОСТ 30483-97/ ДСТУ 4525:2006 Grain impurities, %
3,00
2,00
1,00
0,00
-1,00
-2,00
-3,00
14 -1,56
45 -1,27
10 -0,98
31 -0,90
37 -0,85
2 -0,78
8 -0,75
28 -0,76
43 -0,66
23 -0,60
25 -0,56
38 -0,55
41 -0,54
51 -0,52
5 -0,48
1 -0,36
49 -0,33
19 -0,26
29 -0,22
44 -0,22
26 -0,26
24 -0,17
16 -0,08
17 -0,03
13 0,01
15 0,06
18 0,10
11 0,11
6 0,38
42 0,42
12 0,46
27 0,48
50 0,48
21 0,67
20 0,74
22 0,82
7 1,53
9 1,70
30 1,87
48 1,90
35 2,10
40 2,10
47 2,28
36 2,35

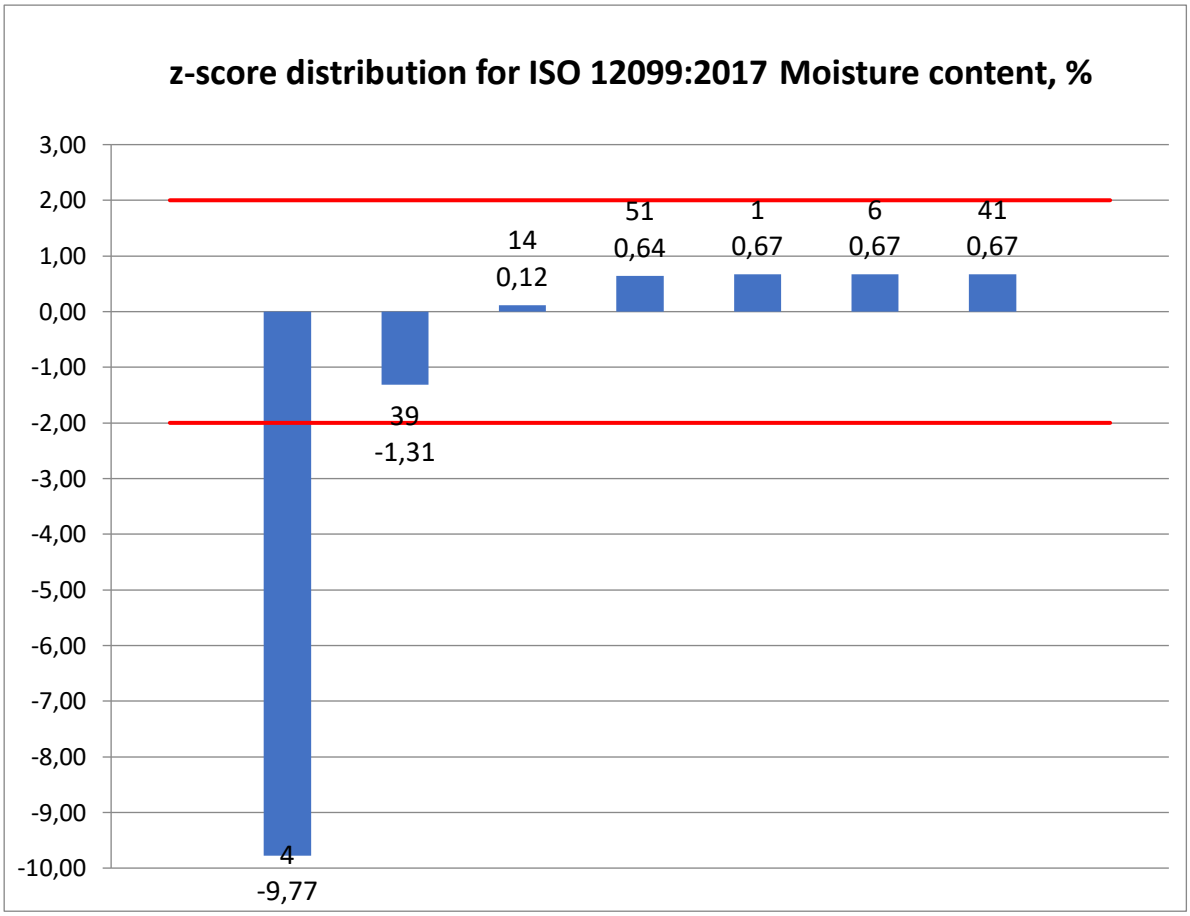
8.16. ISO 6540:2021/ ДСТУ ISO 6540:2007 Moisture content, %



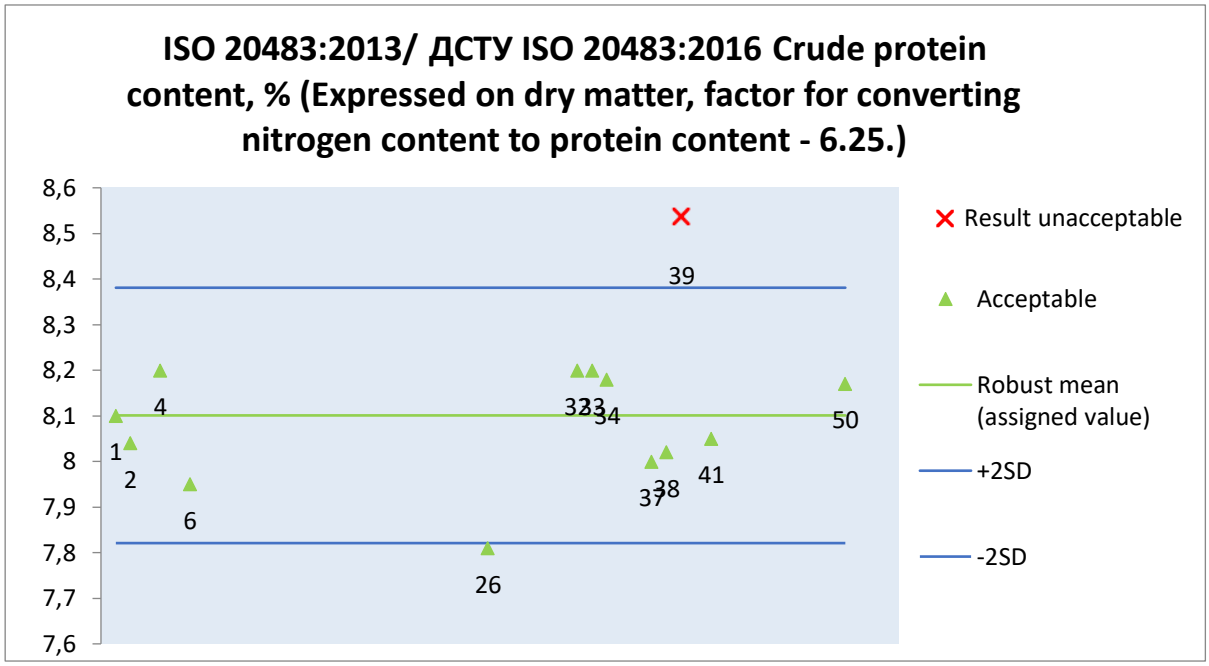


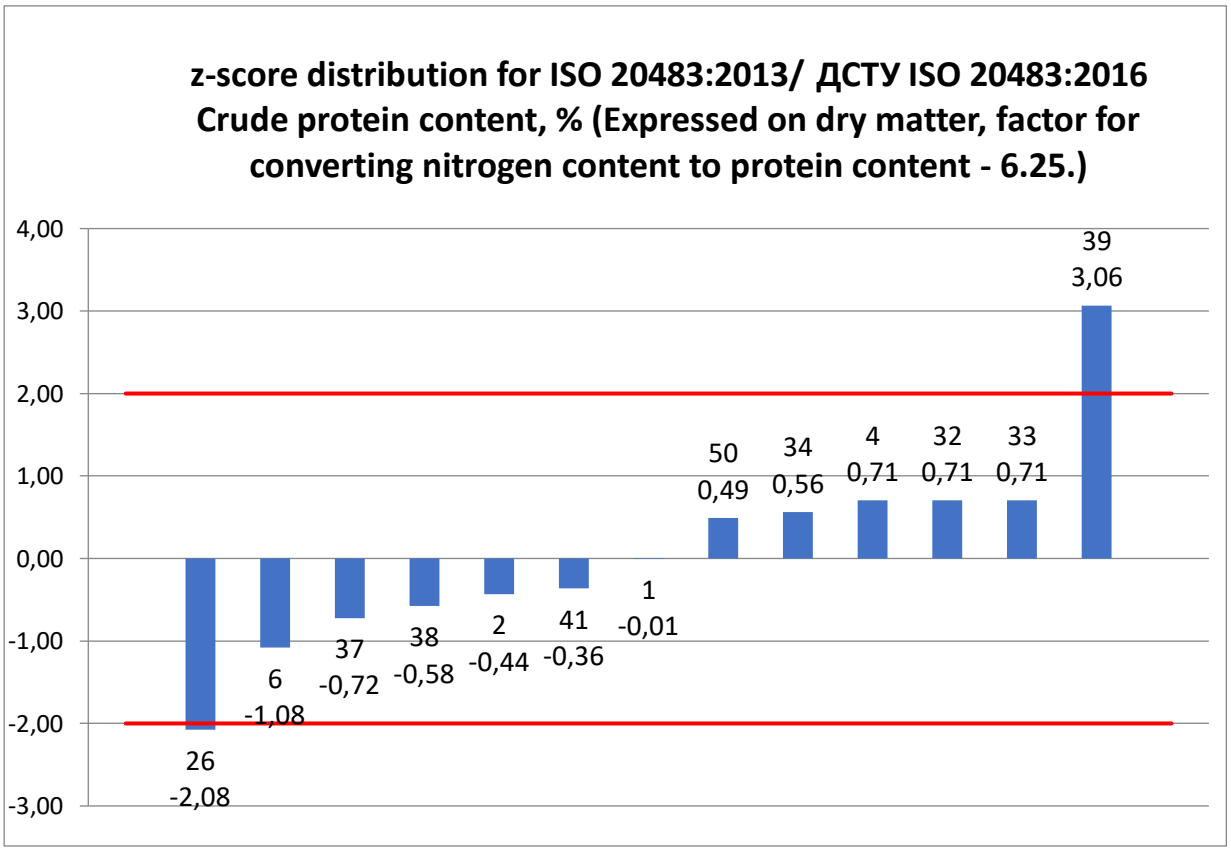
8.17. ISO 12099:2017 Moisture content, %



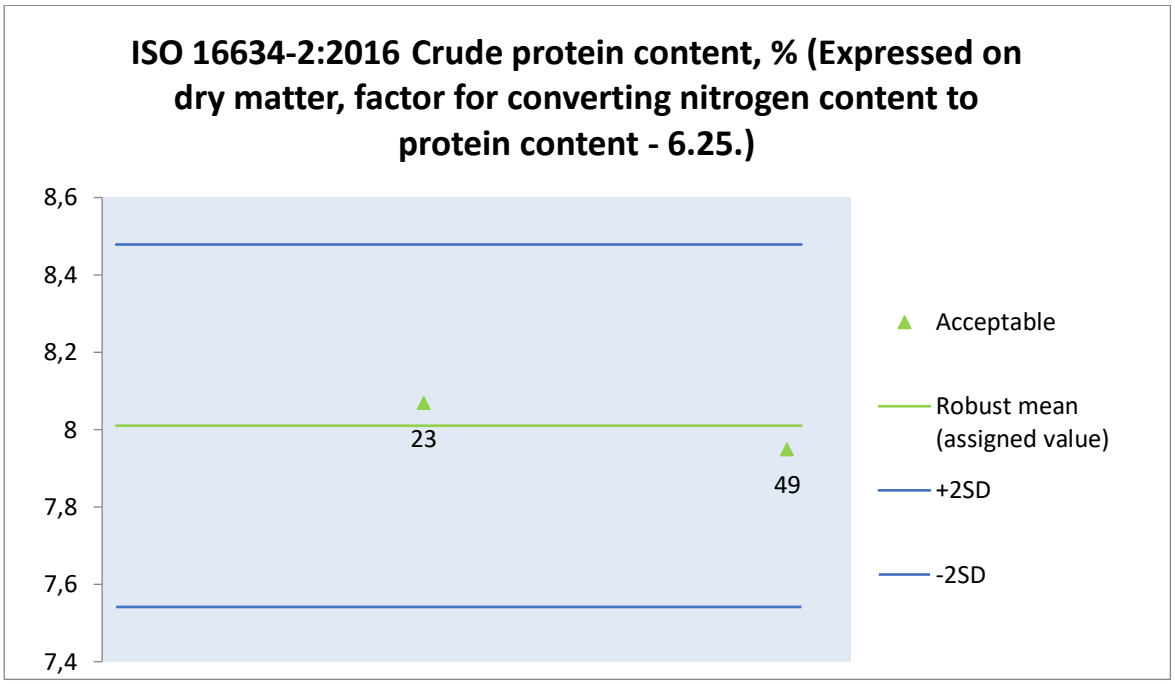


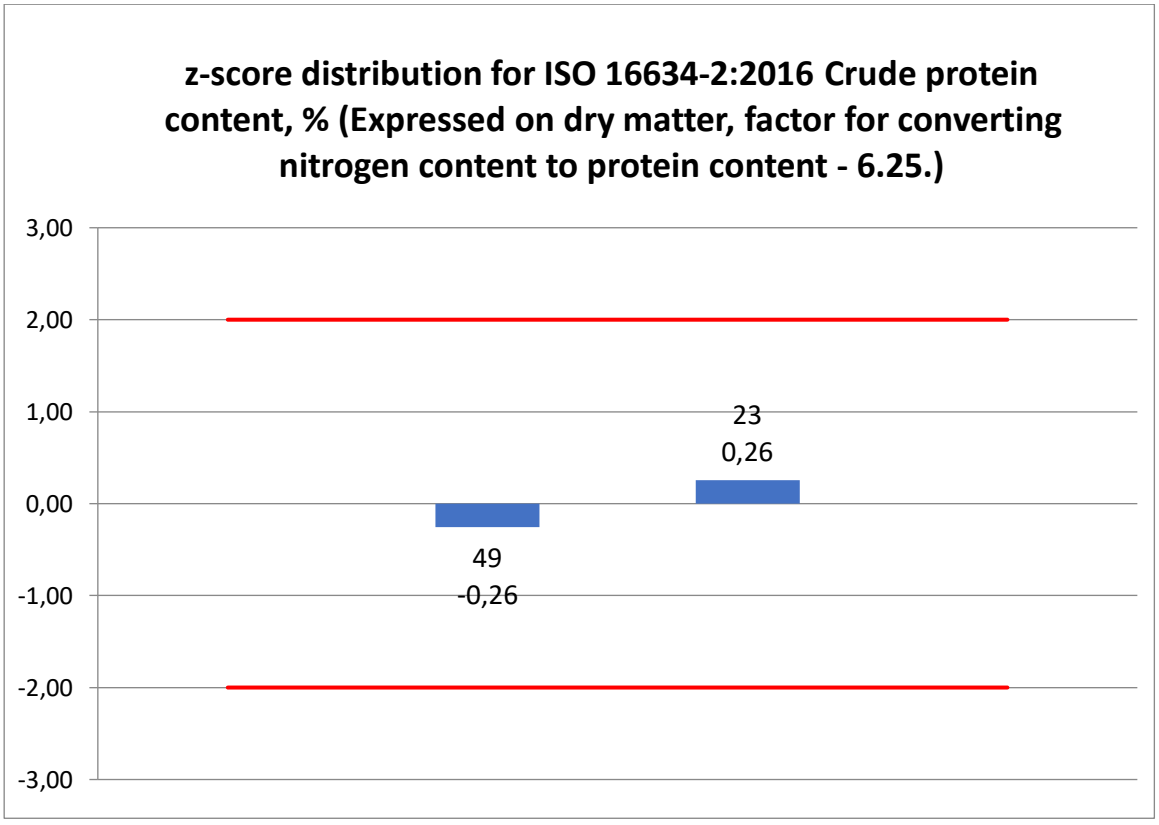
8.18. ISO 20483:2013/ ДСТУ ISO 20483:2016 Crude protein content, % (Expressed on dry matter, factor for converting nitrogen content to protein content - 6.25.)



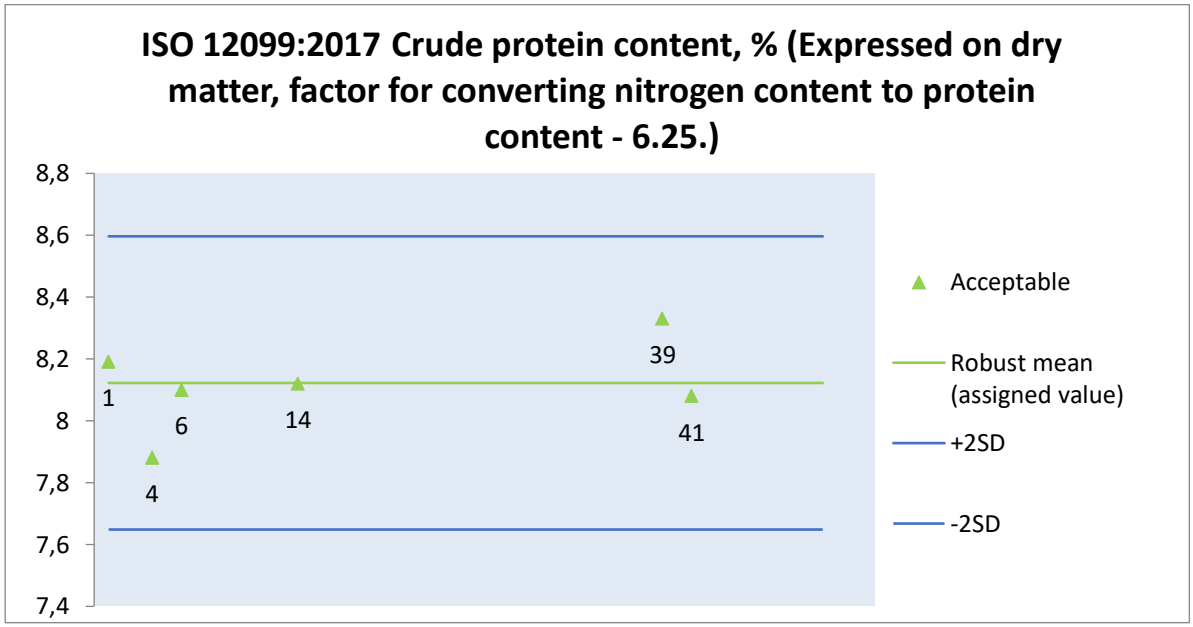


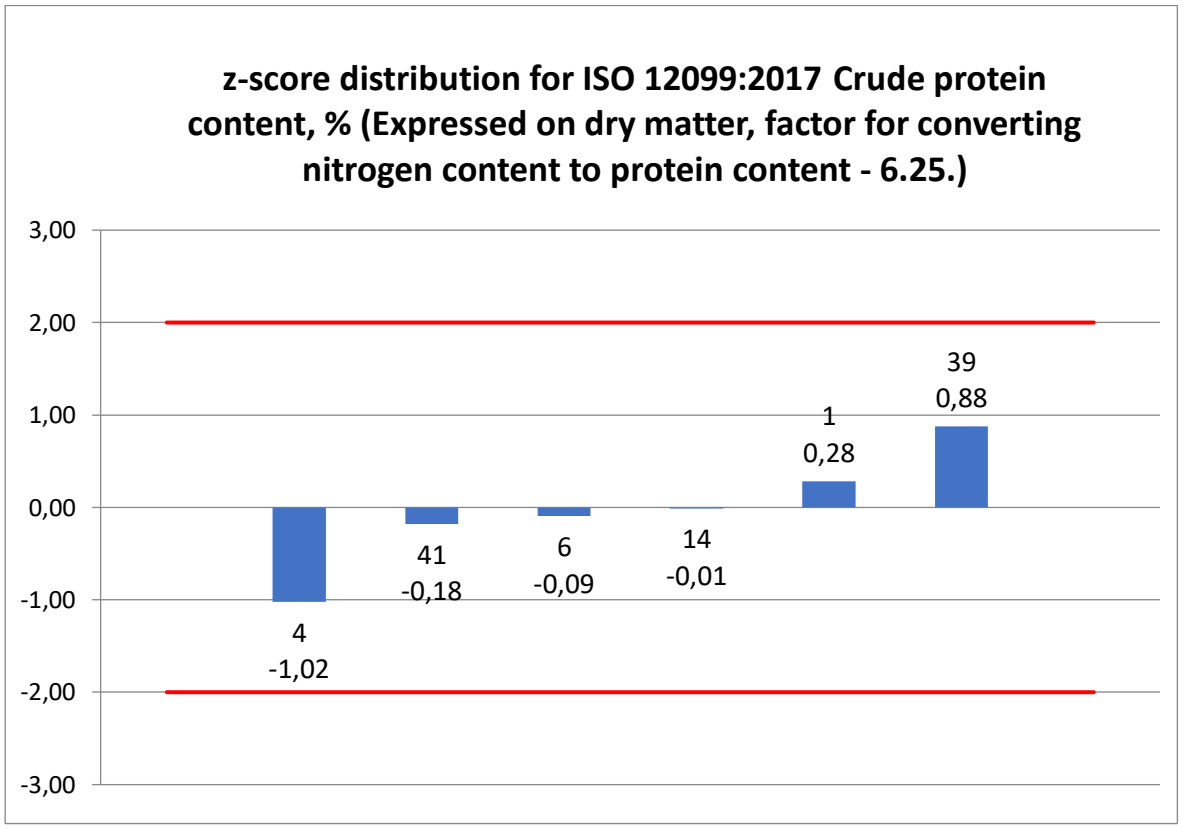
8.19. ISO 16634-2:2016 Crude protein content, % (Expressed on dry matter, factor for converting nitrogen content to protein content - 6.25.)



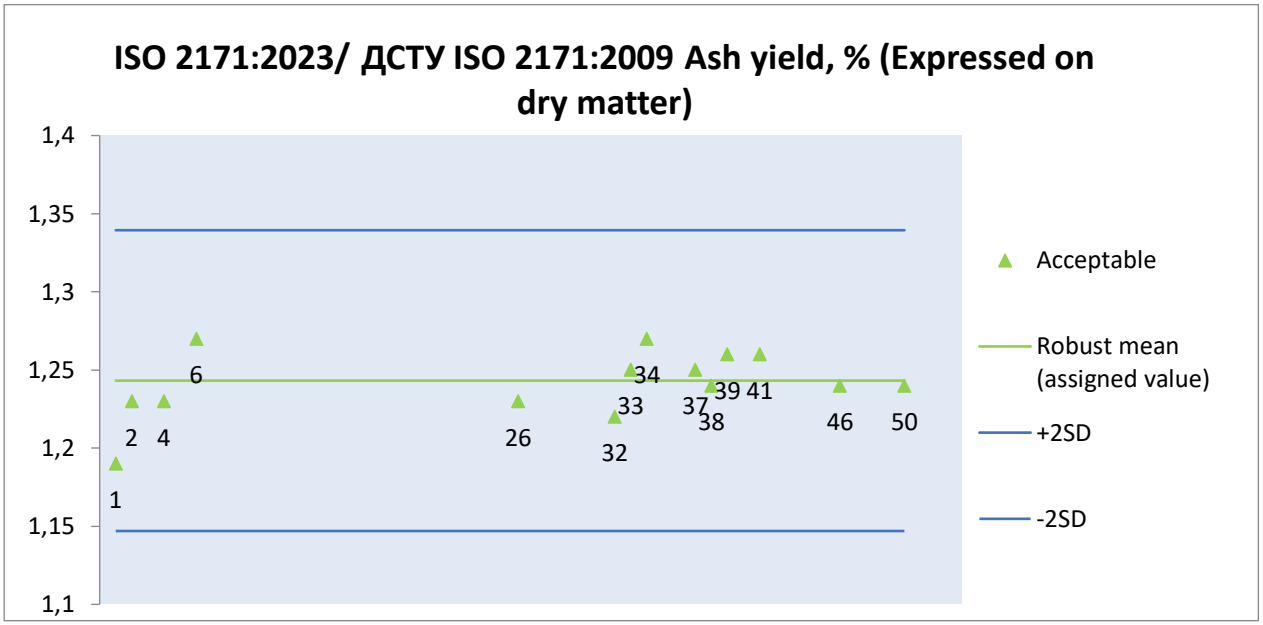


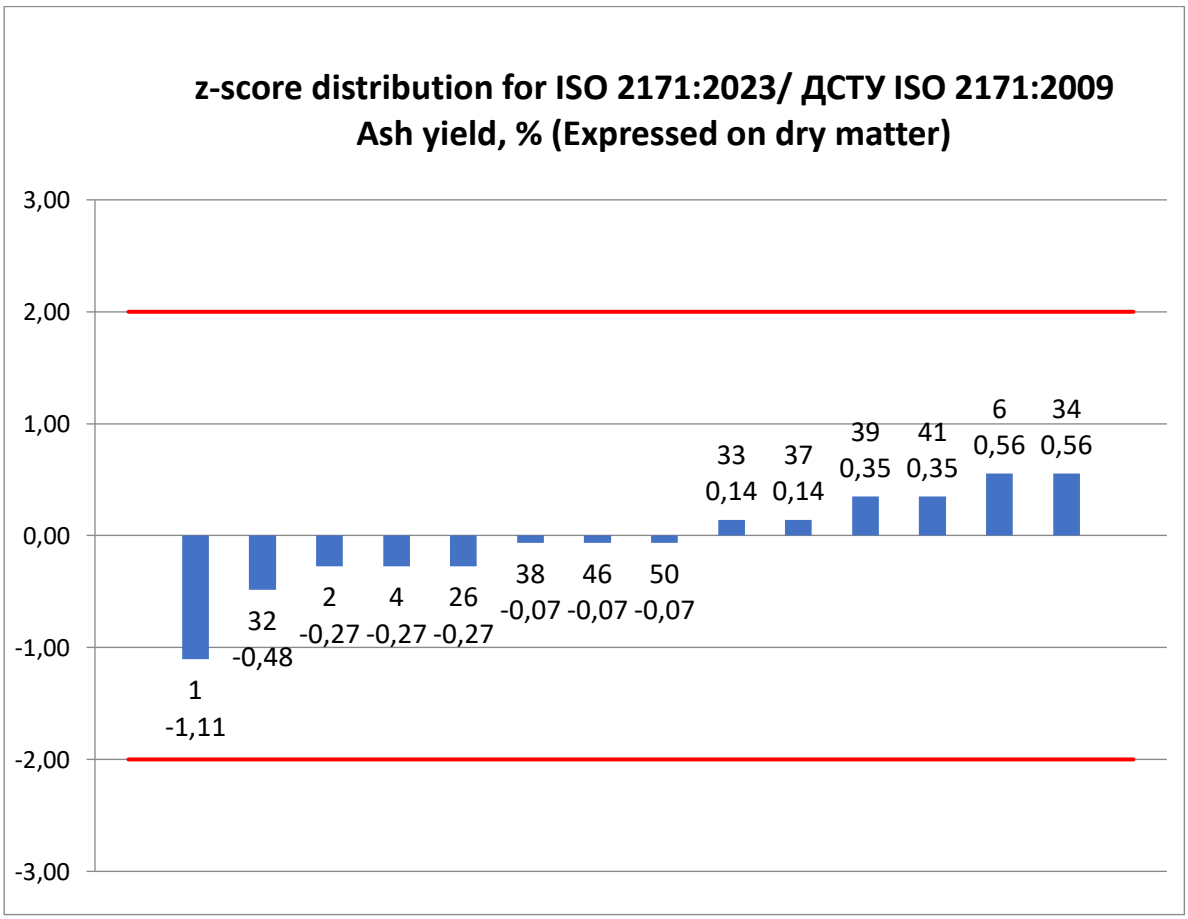
8.20. ISO 12099:2017 Crude protein content, % (Expressed on dry matter, factor for converting nitrogen content to protein content - 6.25.)



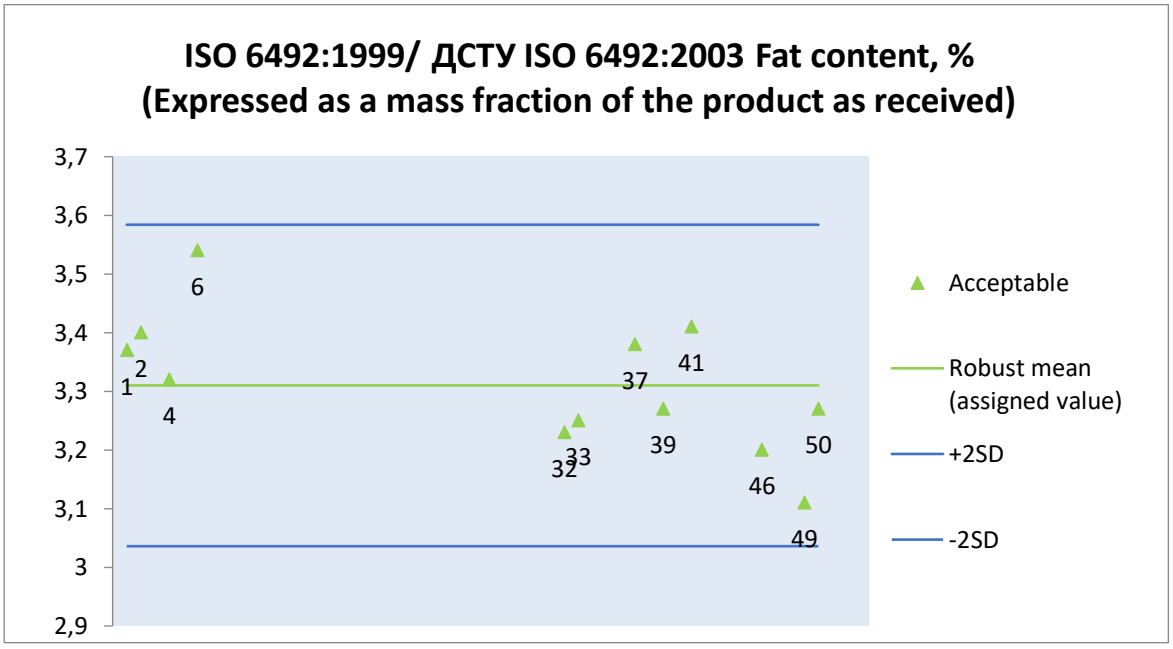


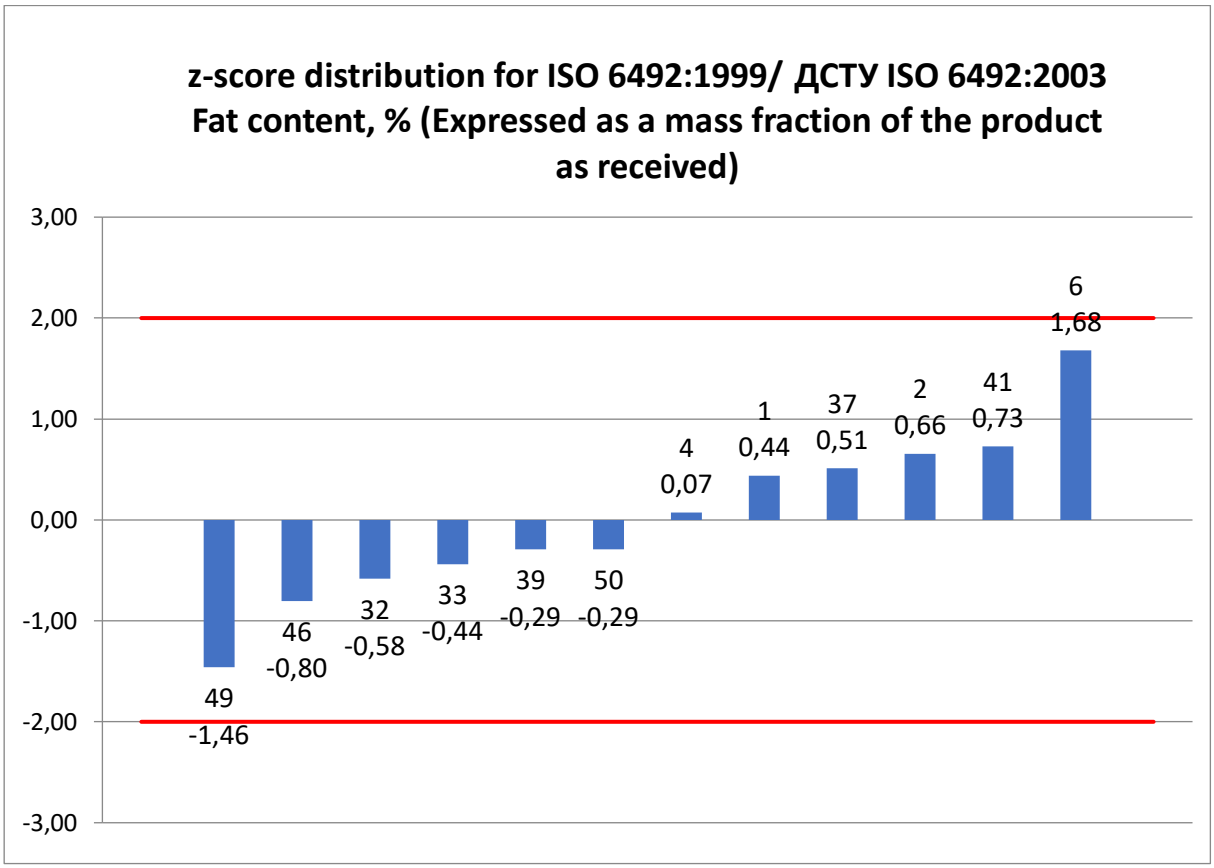
8.21. ISO 2171:2023/ ДСТУ ISO 2171:2009 Ash yield, % (Expressed on dry matter)



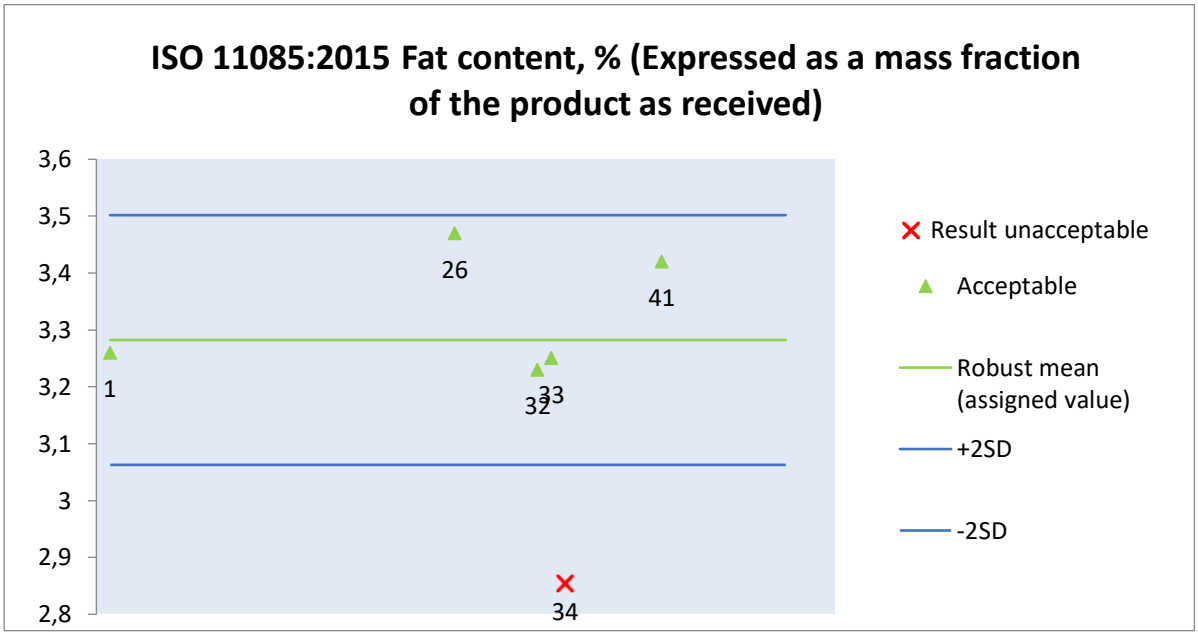


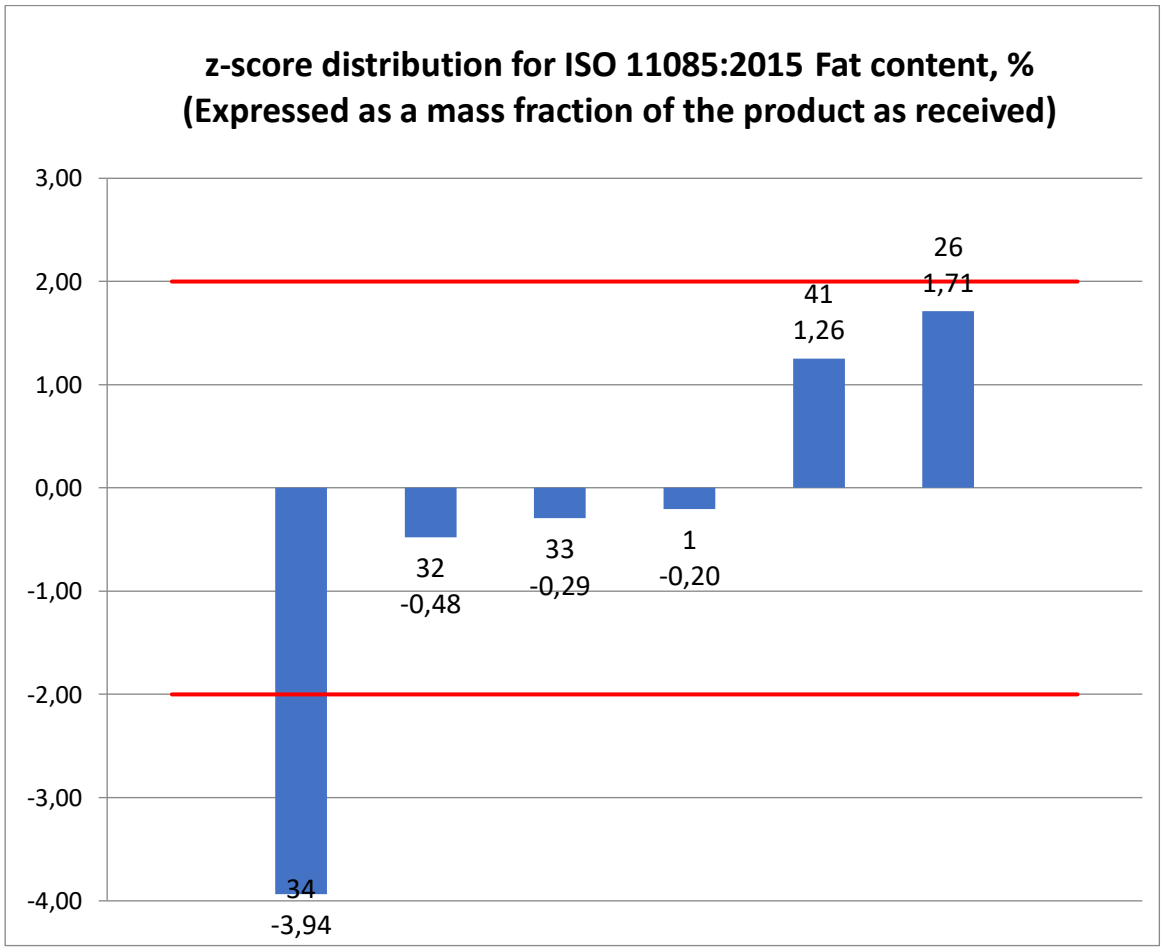
8.22. ISO 6492:1999/ ДСТУ ISO 6492:2003 Fat content, % (Expressed as a mass fraction of the product as received)



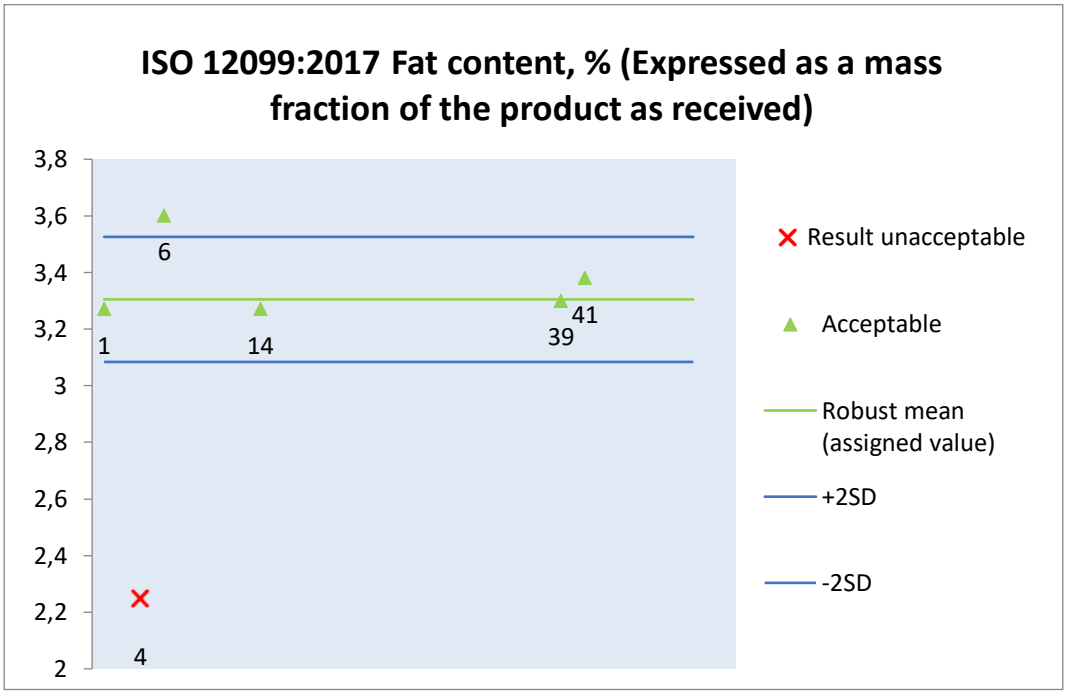


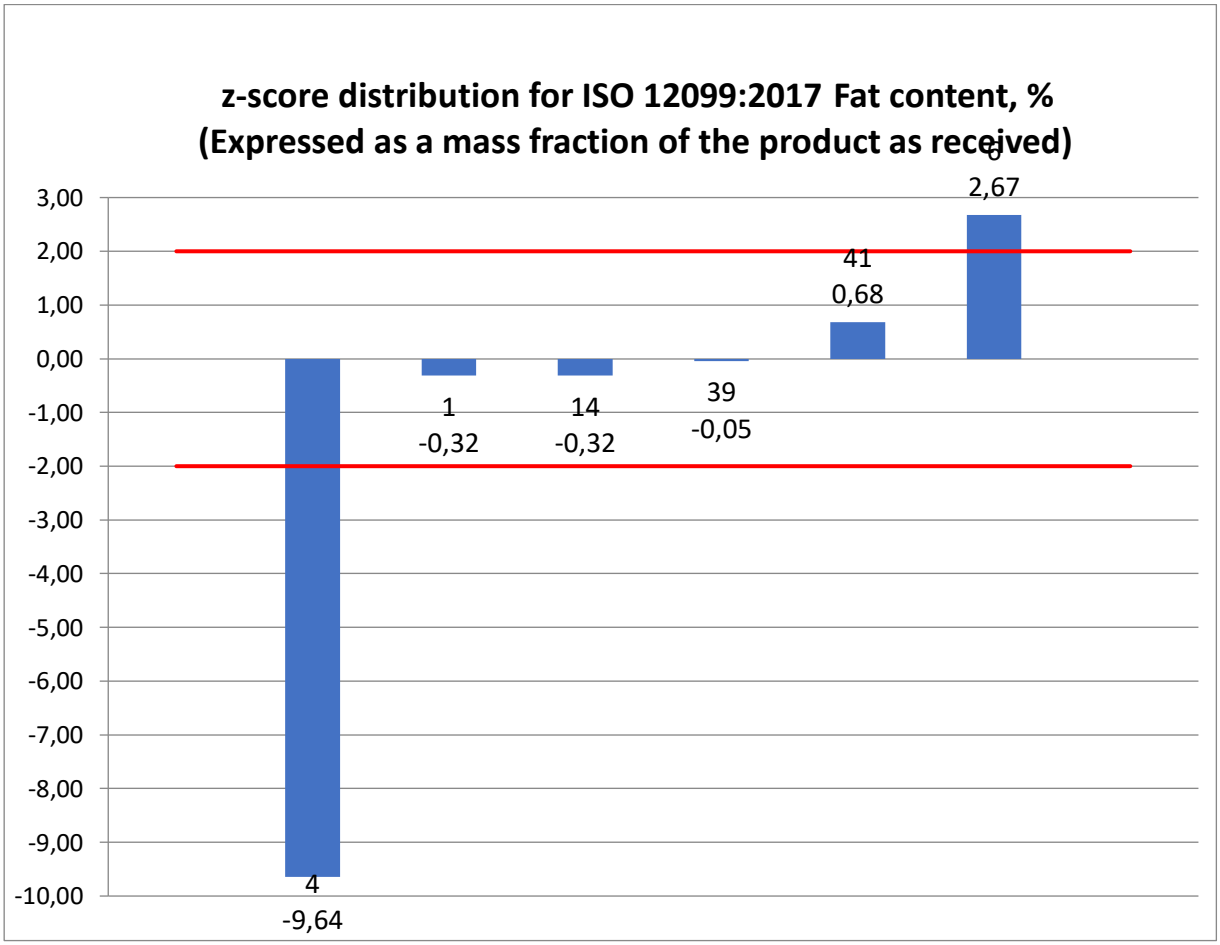
8.23. ISO 11085:2015 Fat content, % (Expressed as a mass fraction of the product as received)



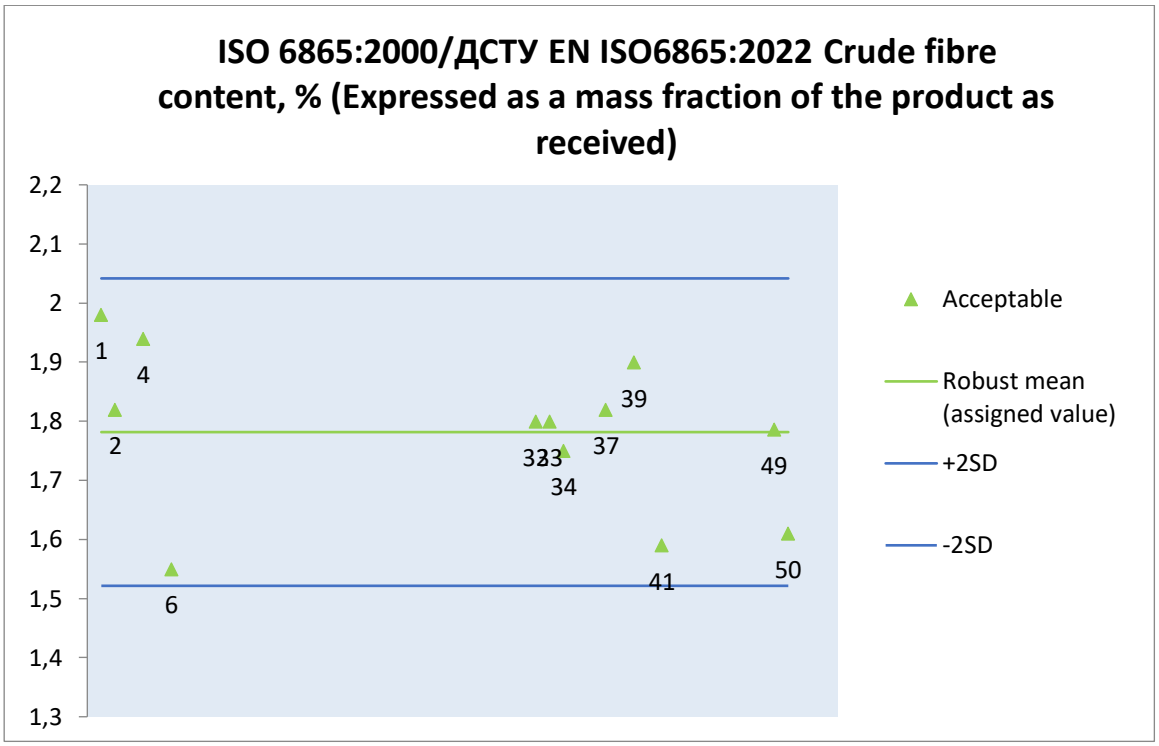


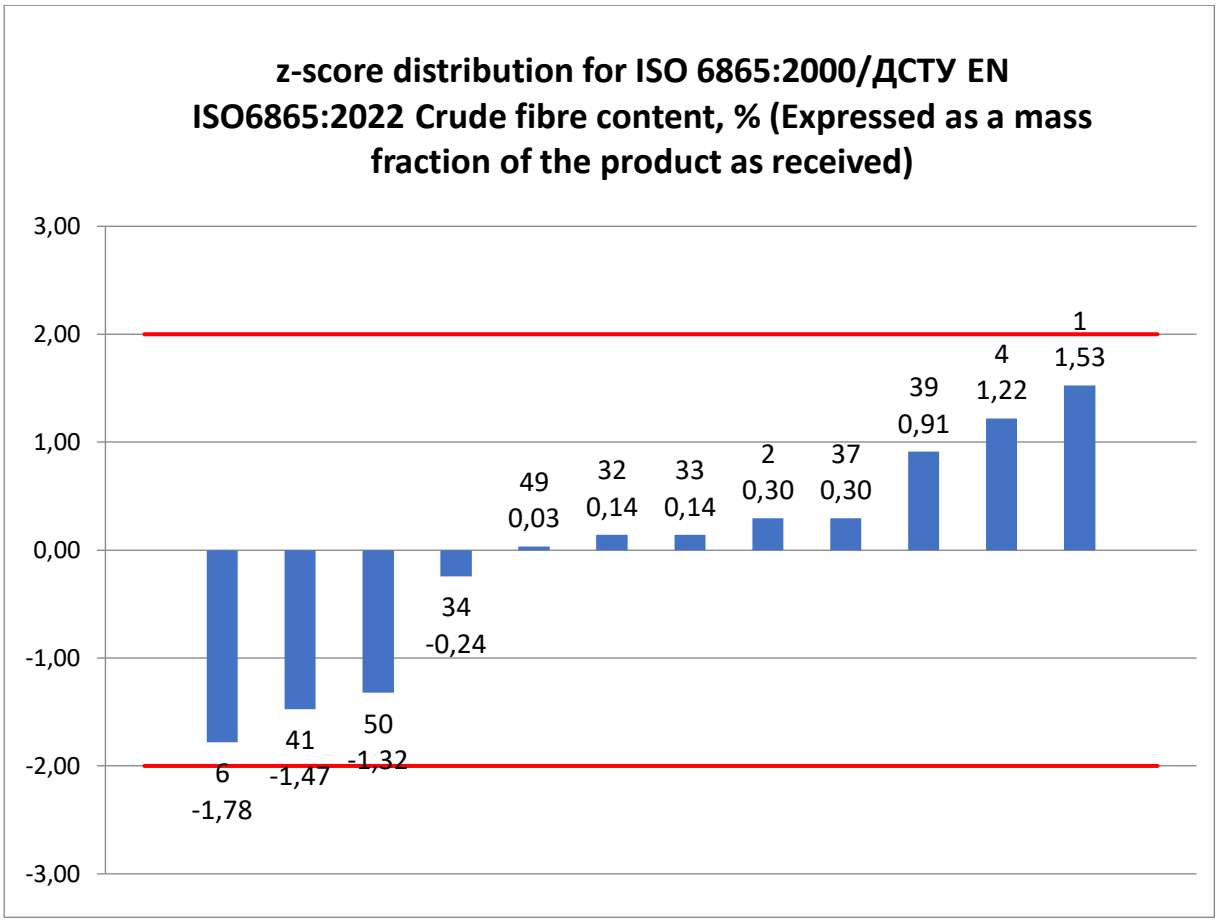
8.24. ISO 12099:2017 Fat content, % (Expressed as a mass fraction of the product as received)



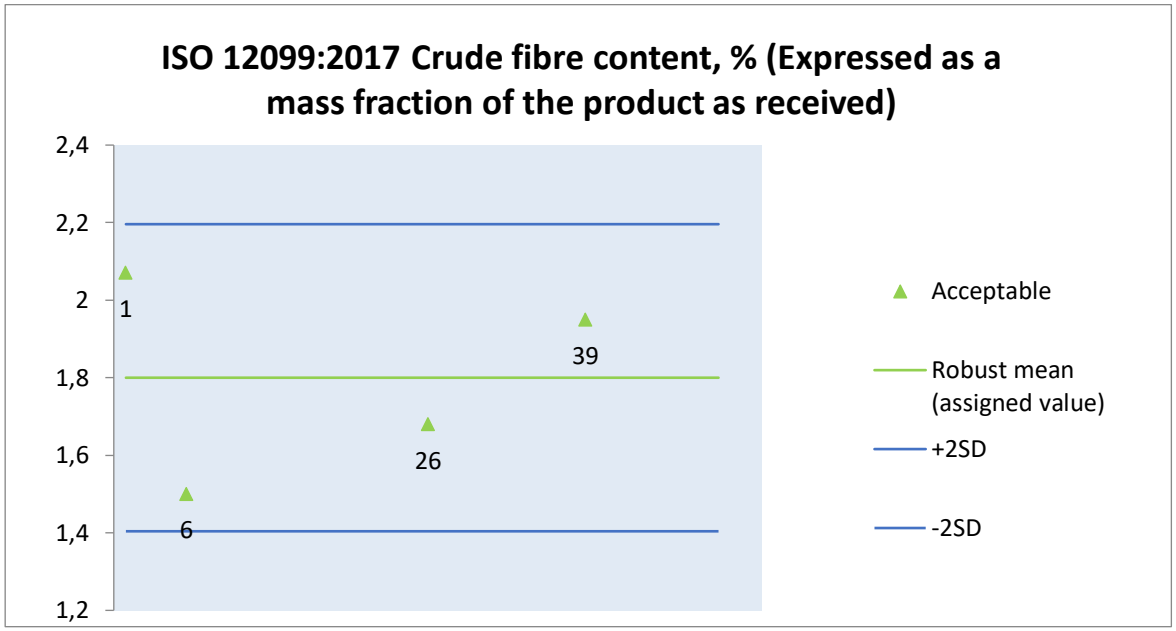


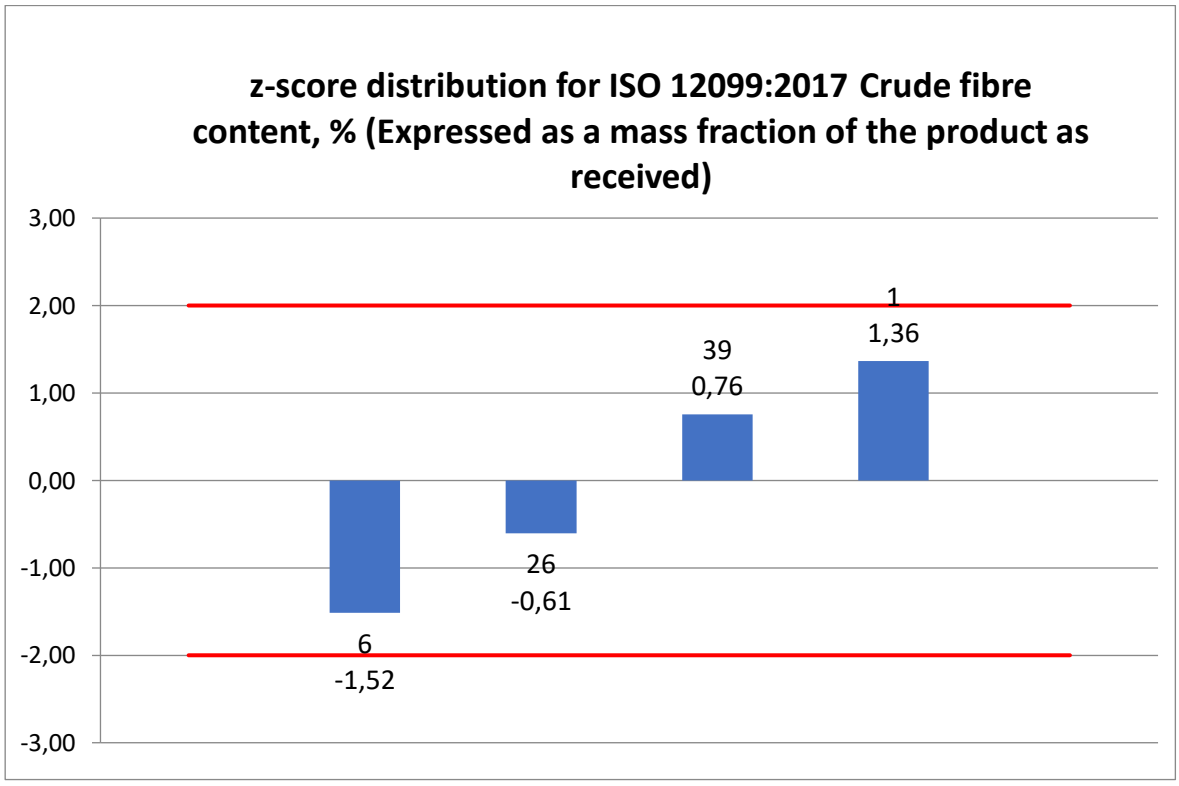
8.25. ISO 6865:2000/ ДСТУ EN ISO6865:2022 Crude fibre content, % (Expressed as a mass fraction of the product as received)



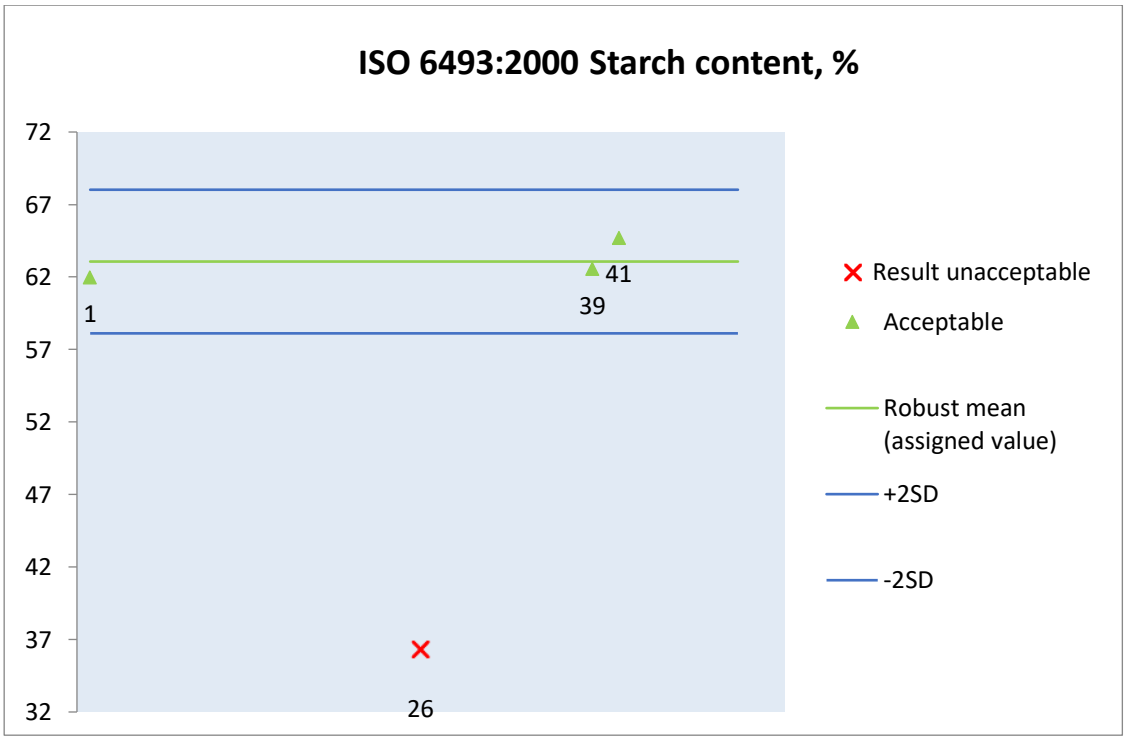


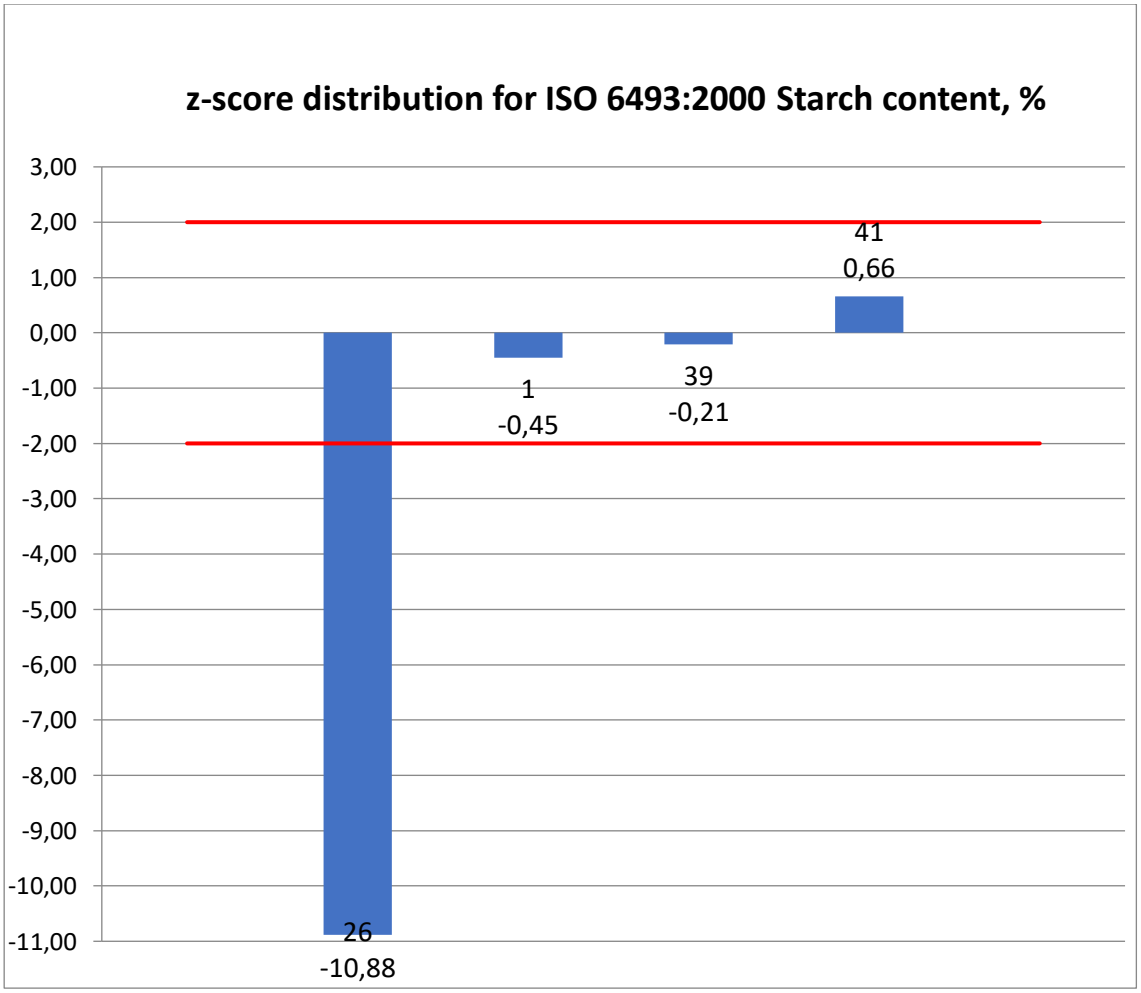
8.26. ISO 12099:2017 Crude fibre content, % (Expressed as a mass fraction of the product as received)



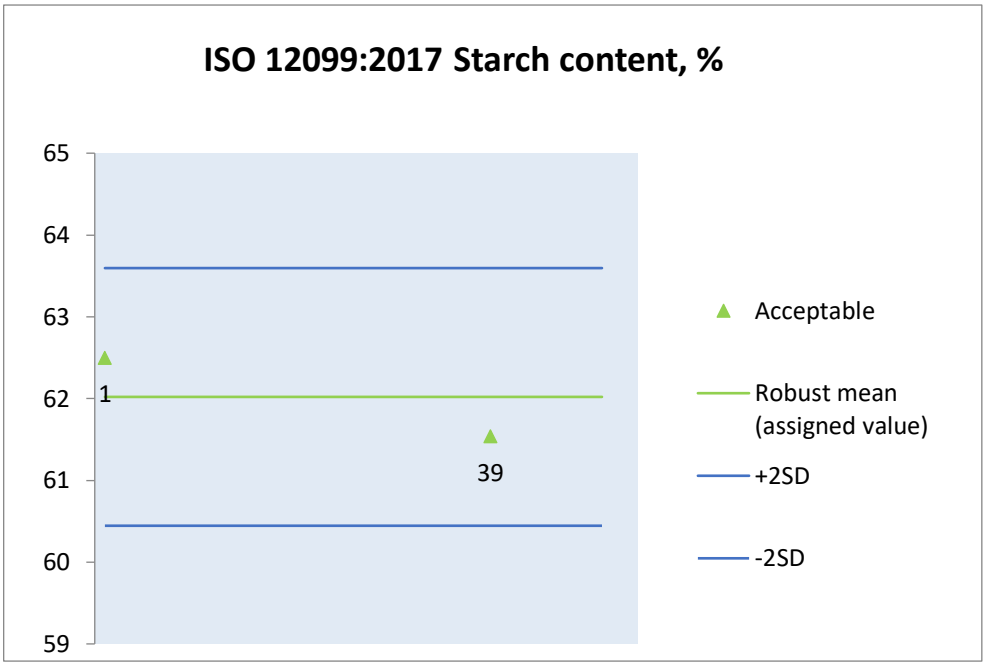


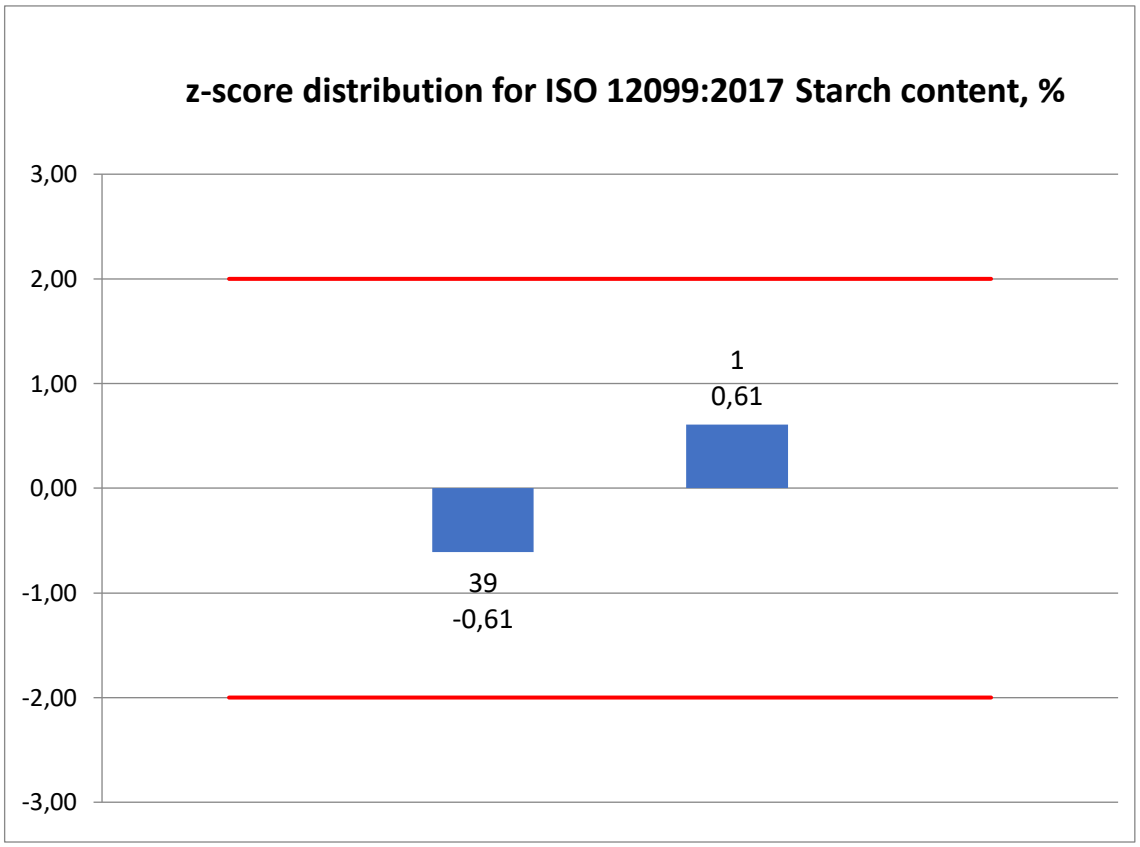
8.27. ISO 6493:2000 Starch content, %



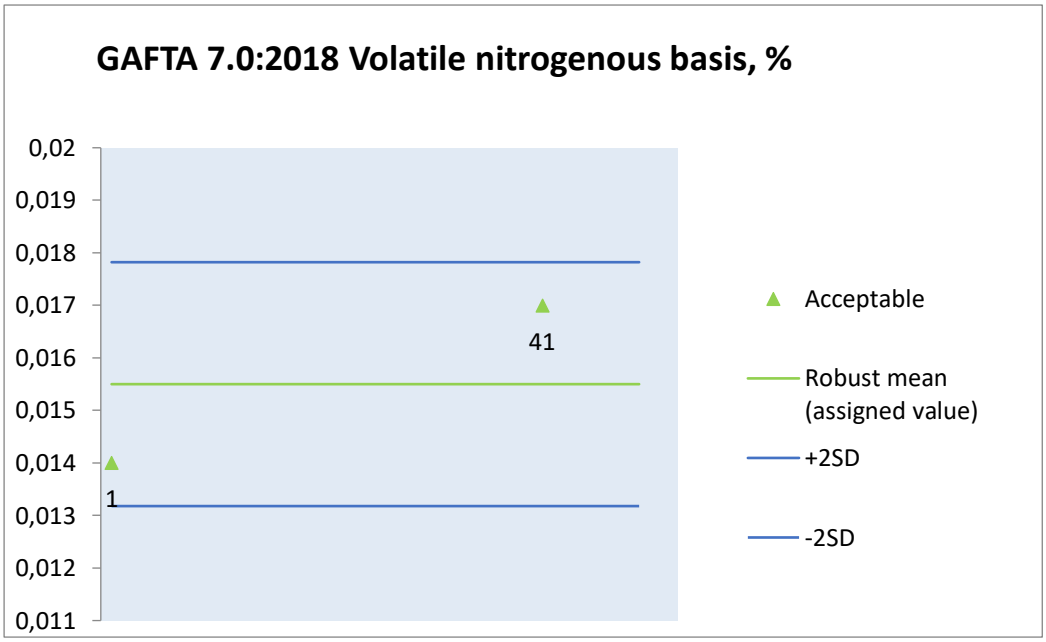


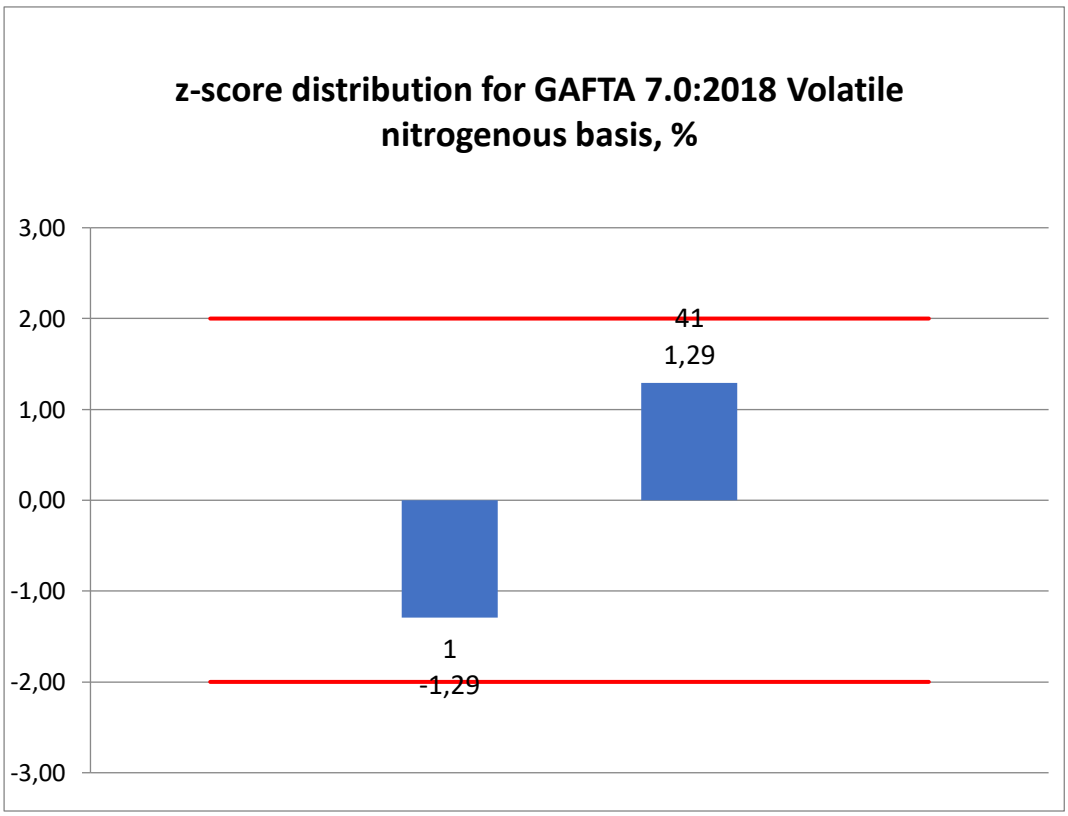
8.28. ISO 12099:2017 Starch content, %



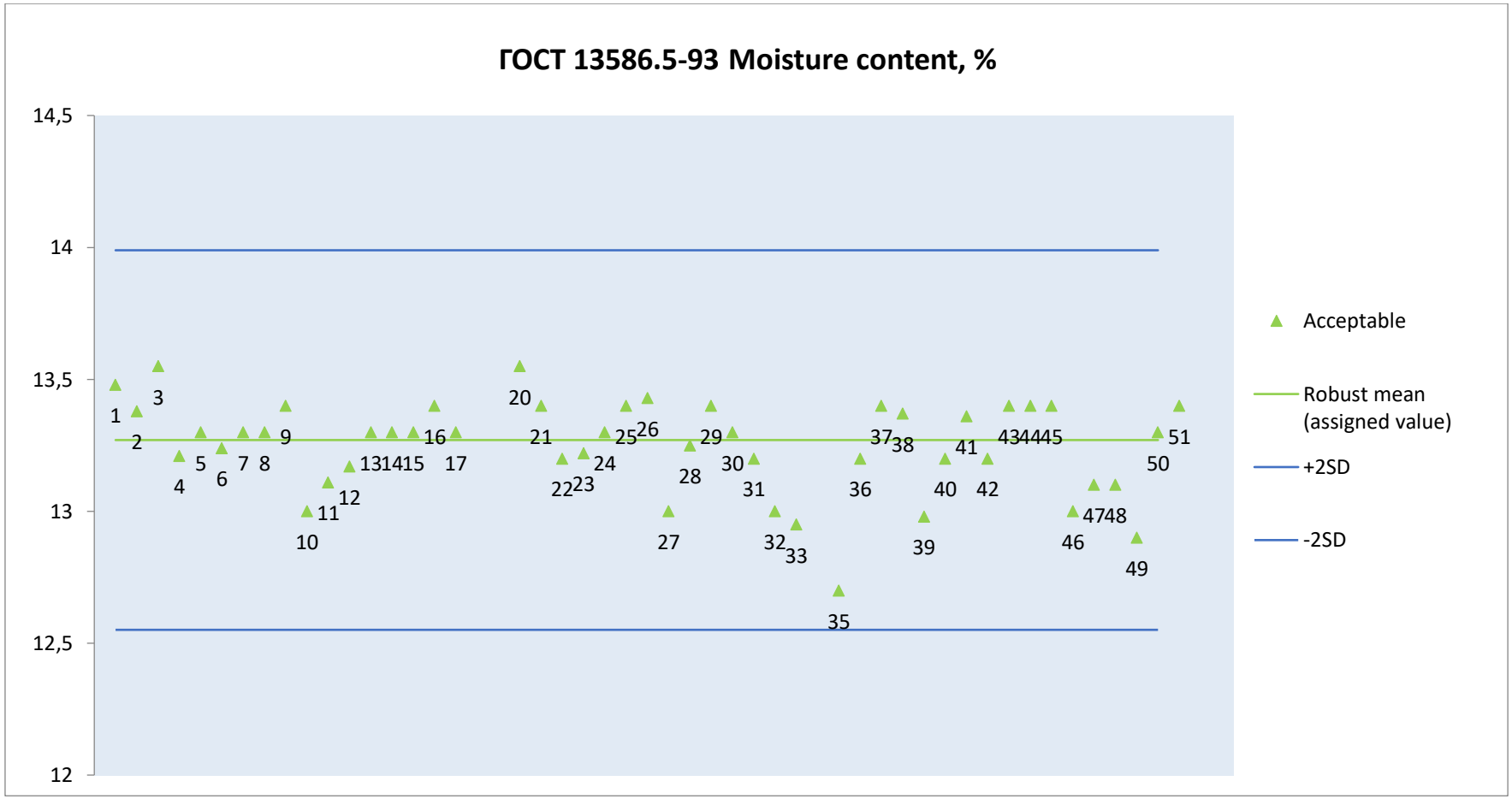


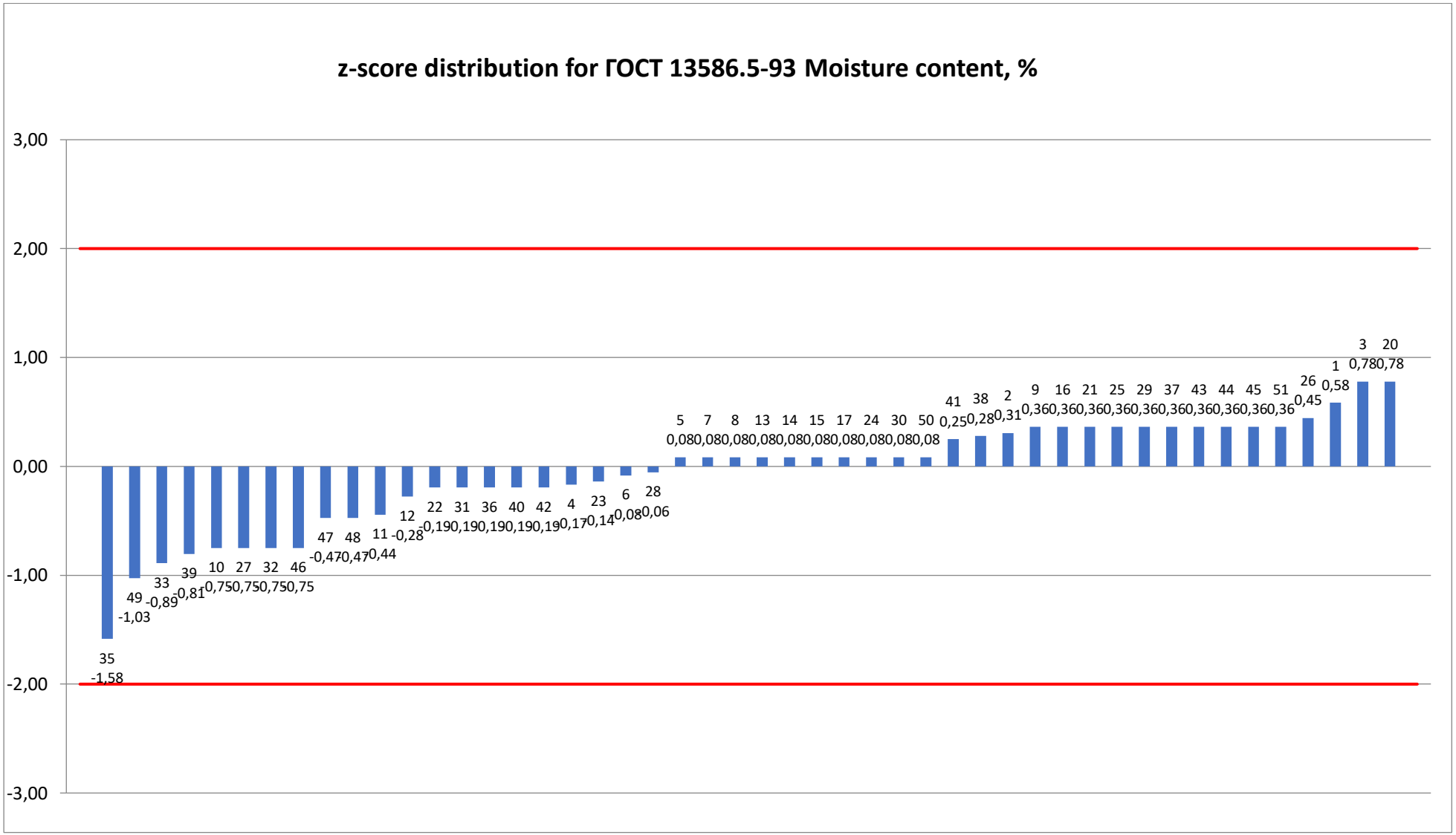
8.29. GAFTA 7.0:2018 Volatile nitrogenous basis, %



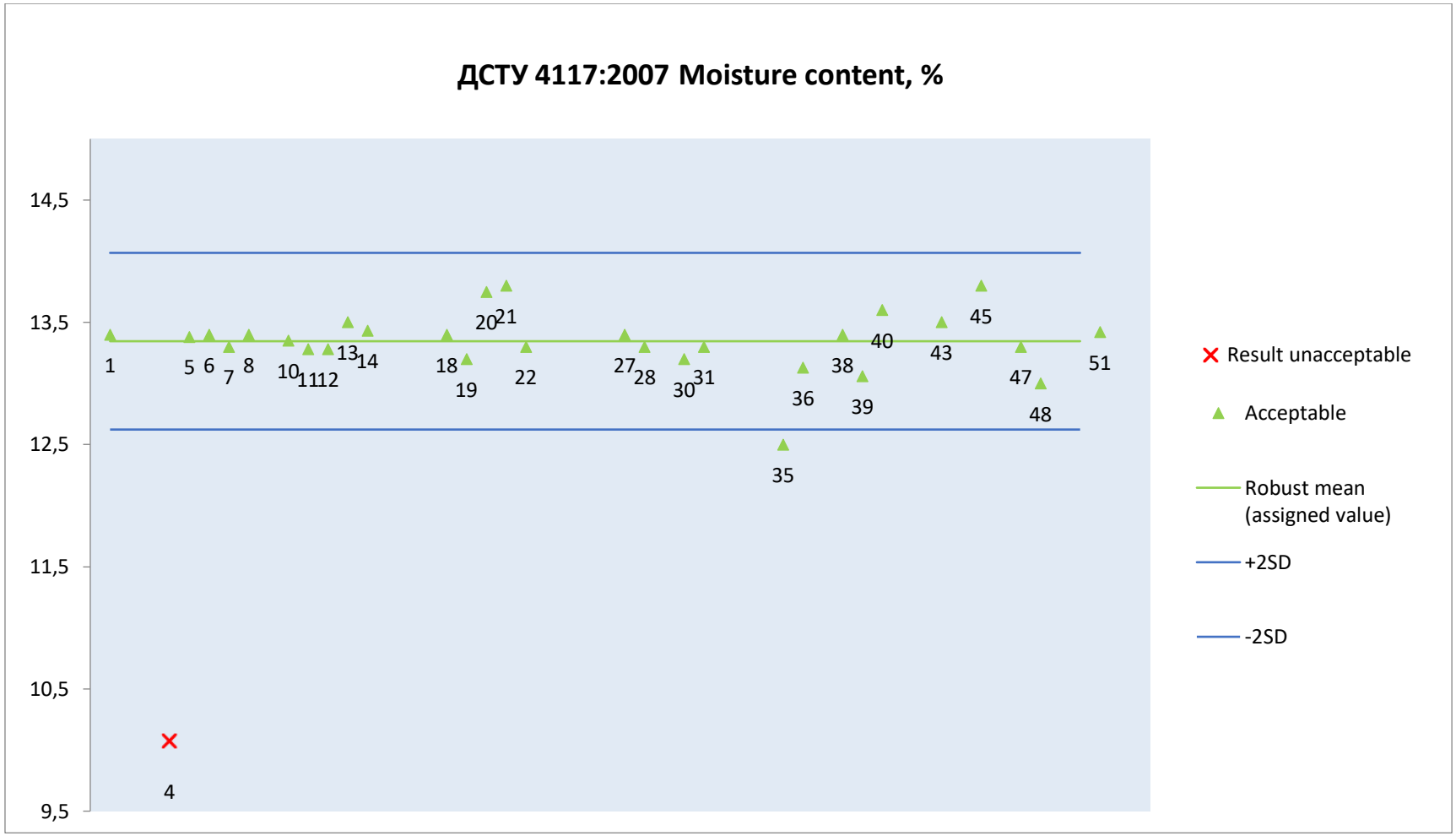


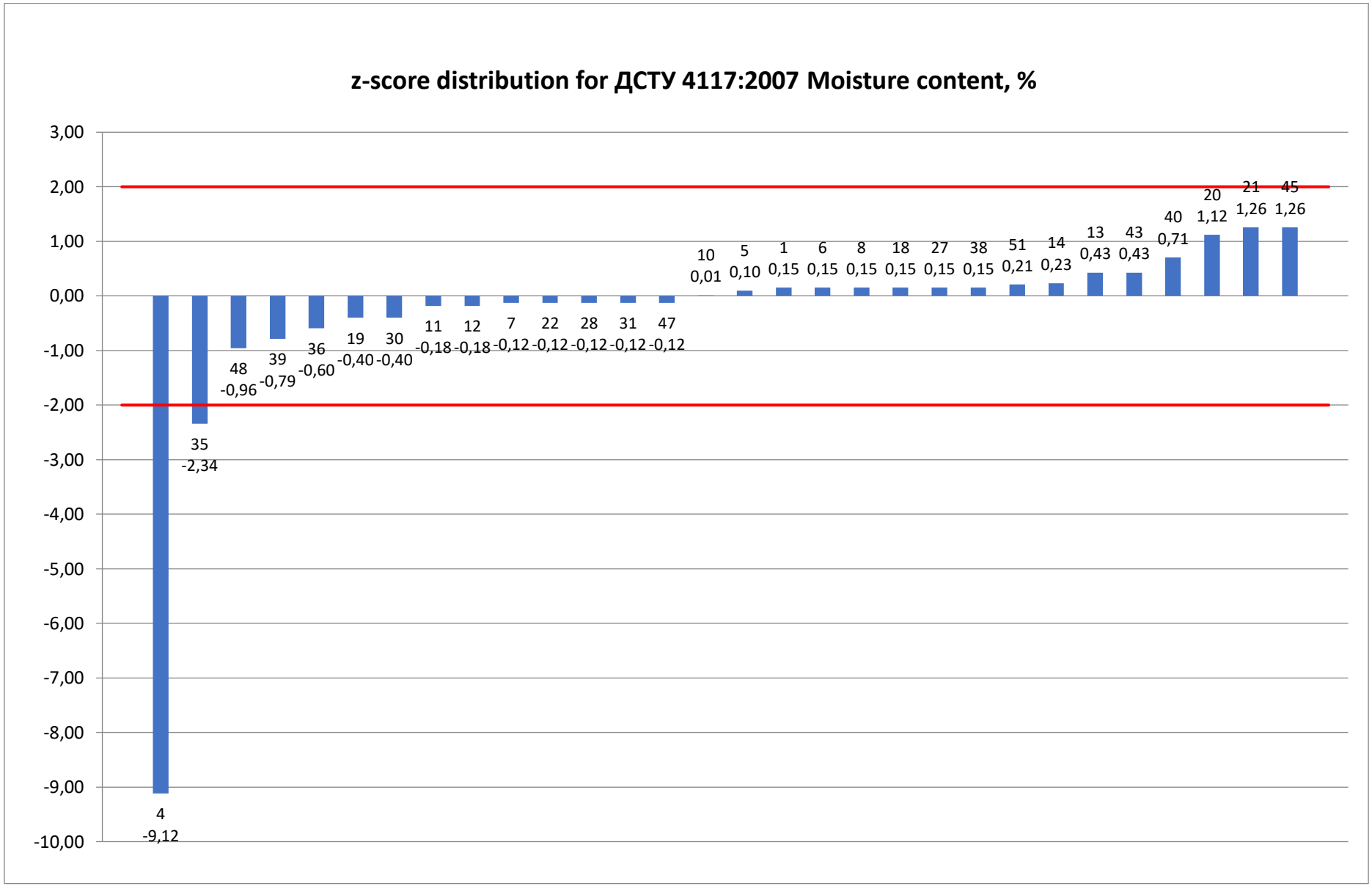
8.30. ГОСТ 13586.5-93 Moisture content, %



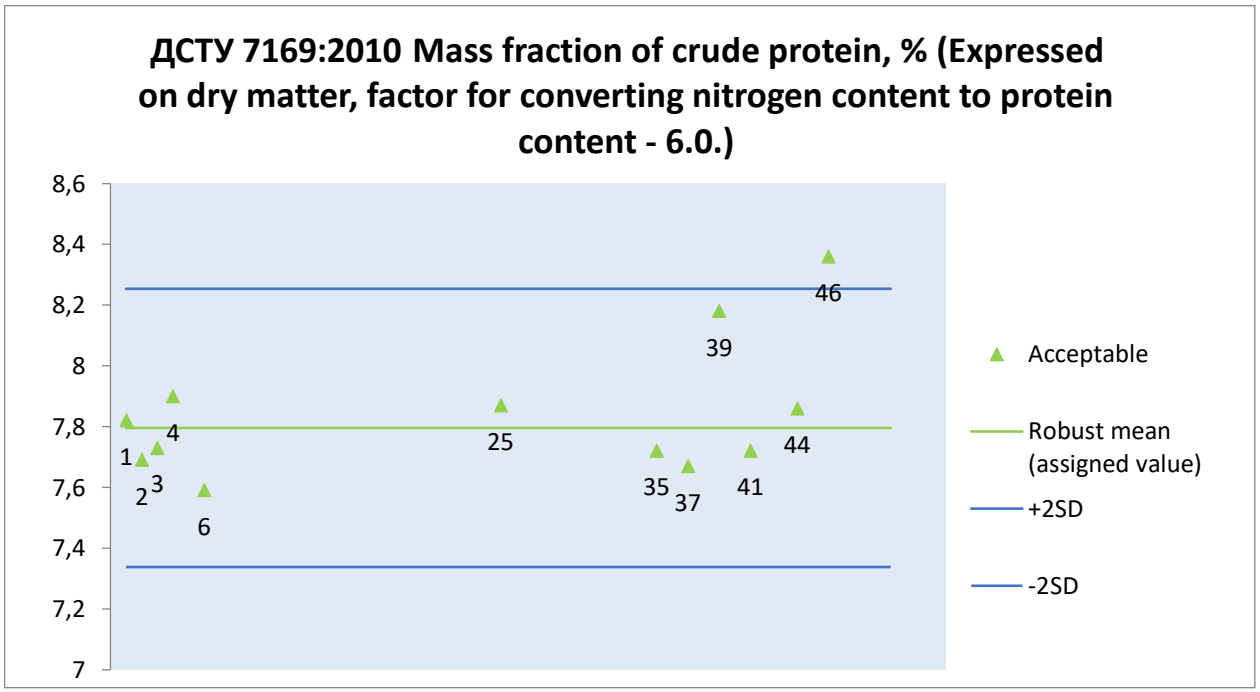

z-score distribution for ГОСТ 13586.5-93 Moisture content, %
3,00
2,00
1,00
0,00
-1,00
-2,00
-3,00
35 -1,58
49 -1,03
33 -0,89
39 -0,81
10 27 32 46 -0,75 -0,75 -0,75 -0,75
47 48 -0,47 -0,47
11 -0,44
12 -0,28
22 31 36 40 42 -0,19 -0,19 -0,19 -0,19
4 -0,17
23 -0,14
6 -0,08
28 -0,06
5 7 8 13 14 15 17 24 30 50 0,08 0,08 0,08 0,08 0,08 0,08 0,08 0,08 0,08 0,08
41 0,25
38 0,28
2 0,31
9 16 21 25 29 37 43 44 45 51 0,36 0,36 0,36 0,36 0,36 0,36 0,36 0,36 0,36 0,36
26 0,45
1 0,58
3 0,78
20 0,78

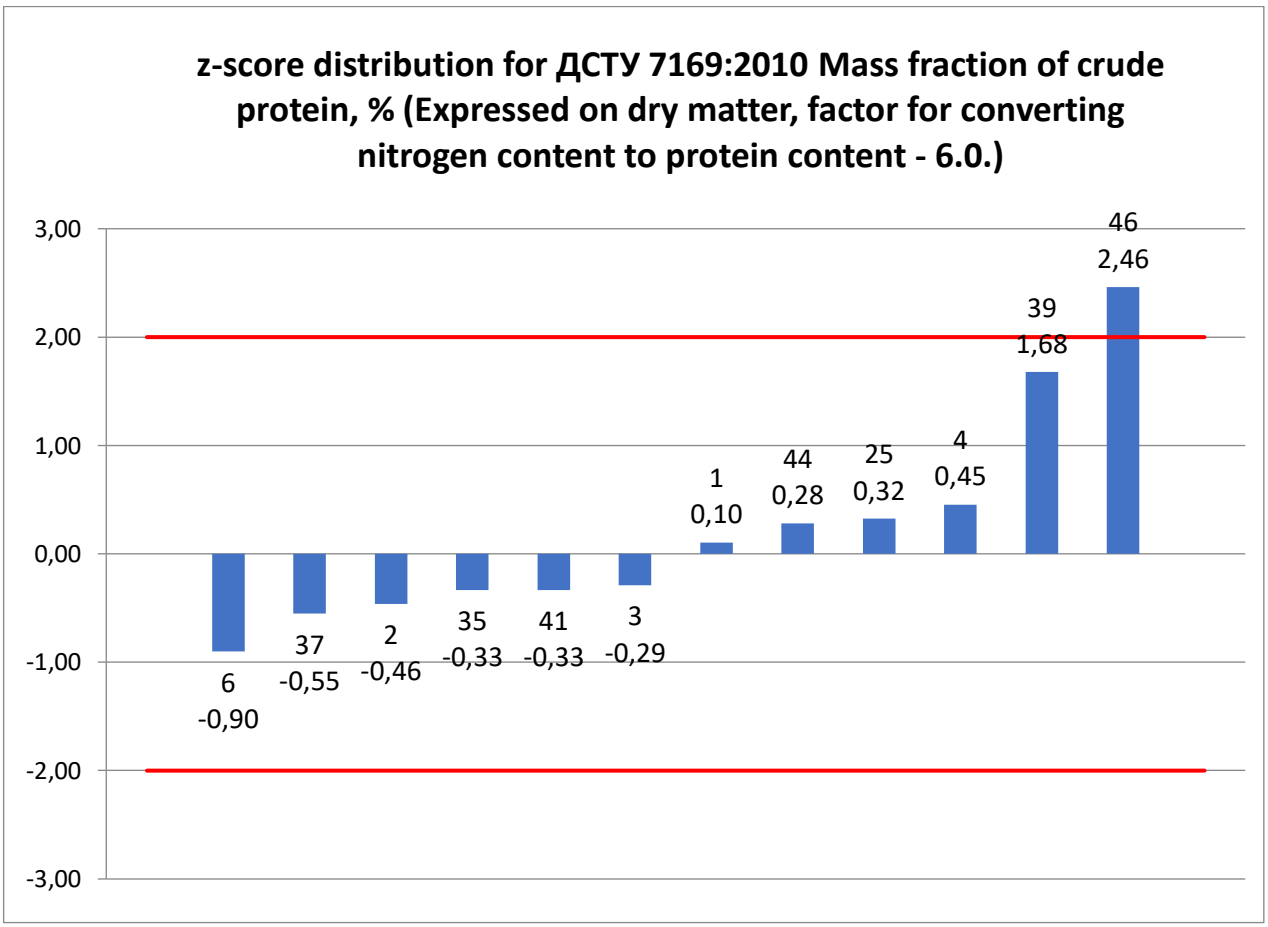
8.31. ДСТУ 4117:2007 Moisture content, %



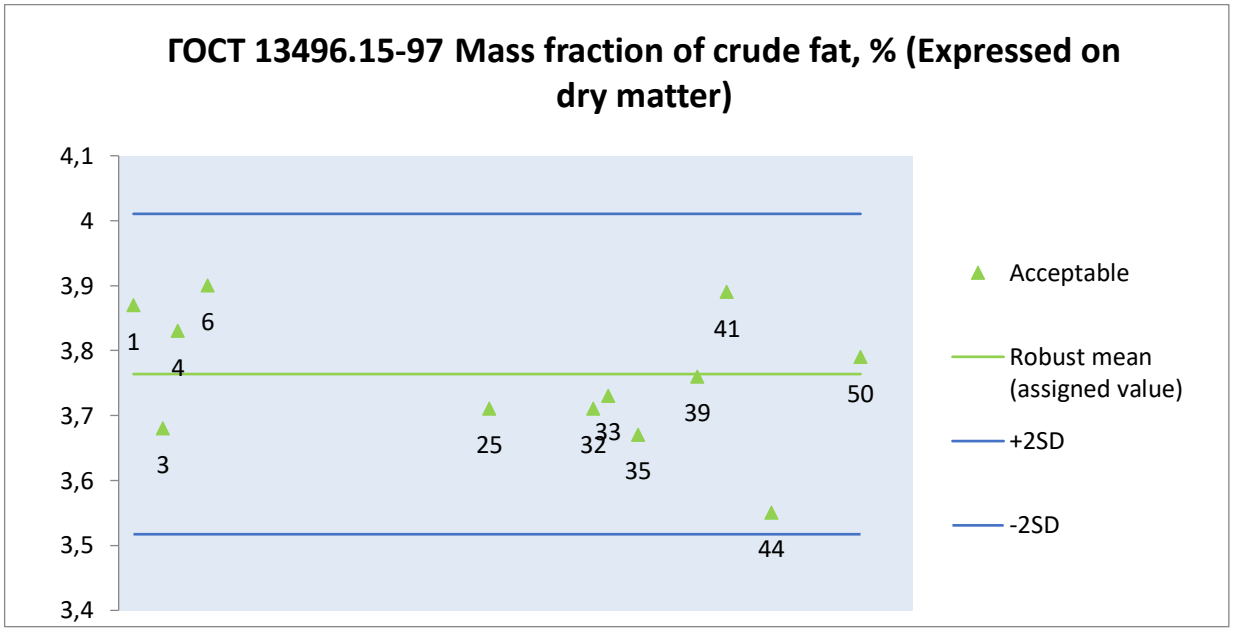

z-score distribution for ДСТУ 4117:2007 Moisture content, %
3,00
2,00
1,00
0,00
-1,00
-2,00
-3,00
-4,00
-5,00
-6,00
-7,00
-8,00
-9,00
-10,00
4 -9,12
35 -2,34
48 -0,96
39 -0,79
36 -0,60
19 -0,40
30 -0,40
11 -0,18
12 -0,18
7 -0,12
22 -0,12
28 -0,12
31 -0,12
47 -0,12
10 0,01
5 0,10
1 0,15
6 0,15
8 0,15
18 0,15
27 0,15
38 0,15
51 0,21
14 0,23
13 0,43
43 0,43
40 0,71
20 1,12
21 1,26
45 1,26

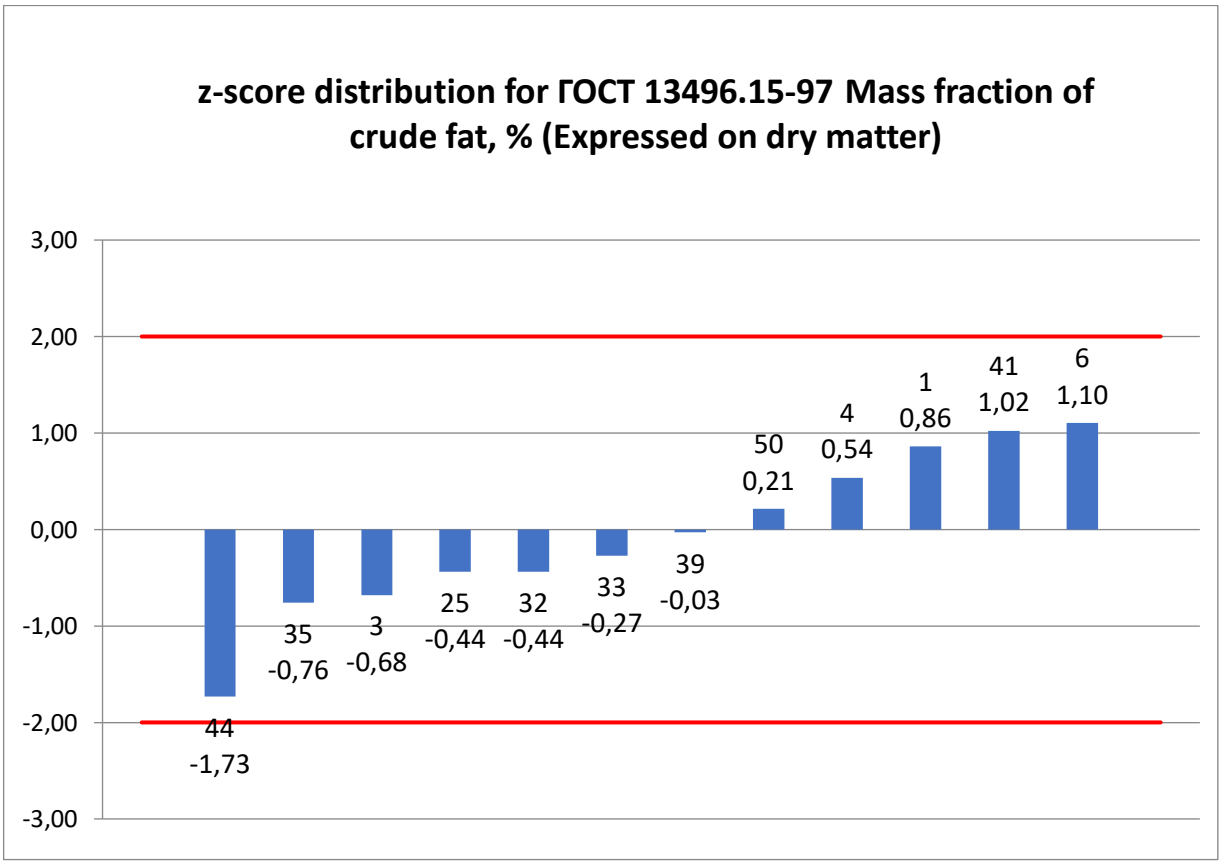
8.32. ДСТУ 7169:2010 Mass fraction of crude protein, % (Expressed on dry matter, factor for converting nitrogen content to protein content - 6.0.)



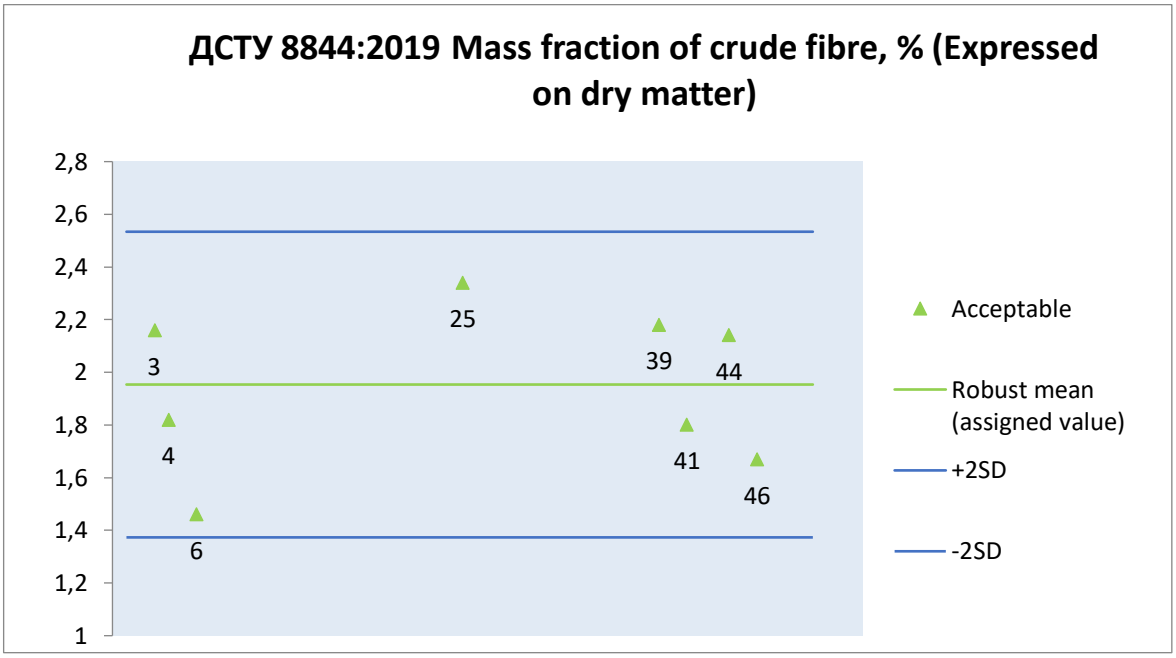


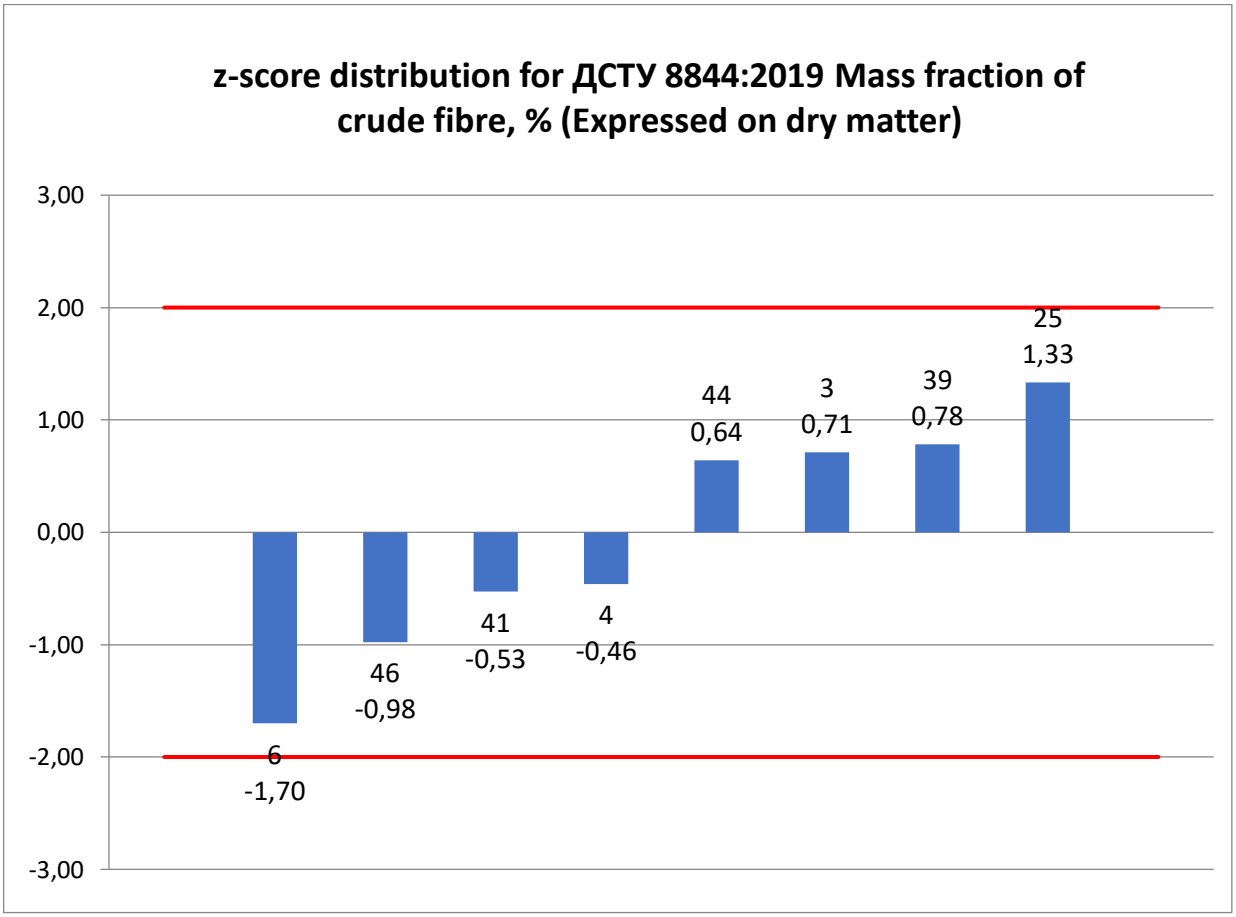
8.33. ГОСТ 13496.15-97 Mass fraction of crude fat, % (Expressed on dry matter)



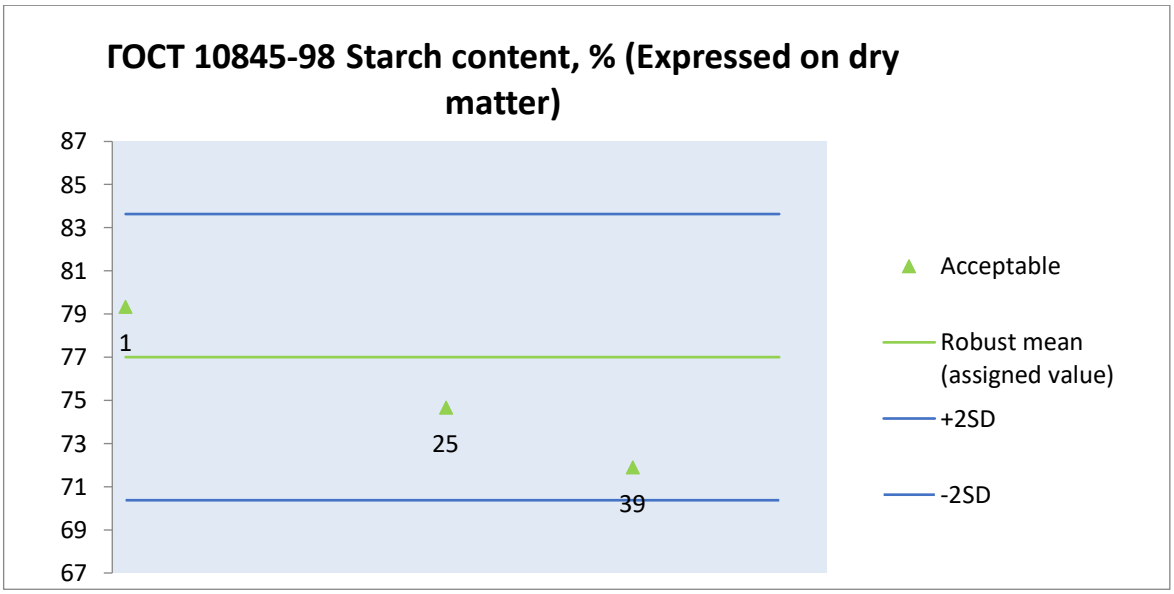


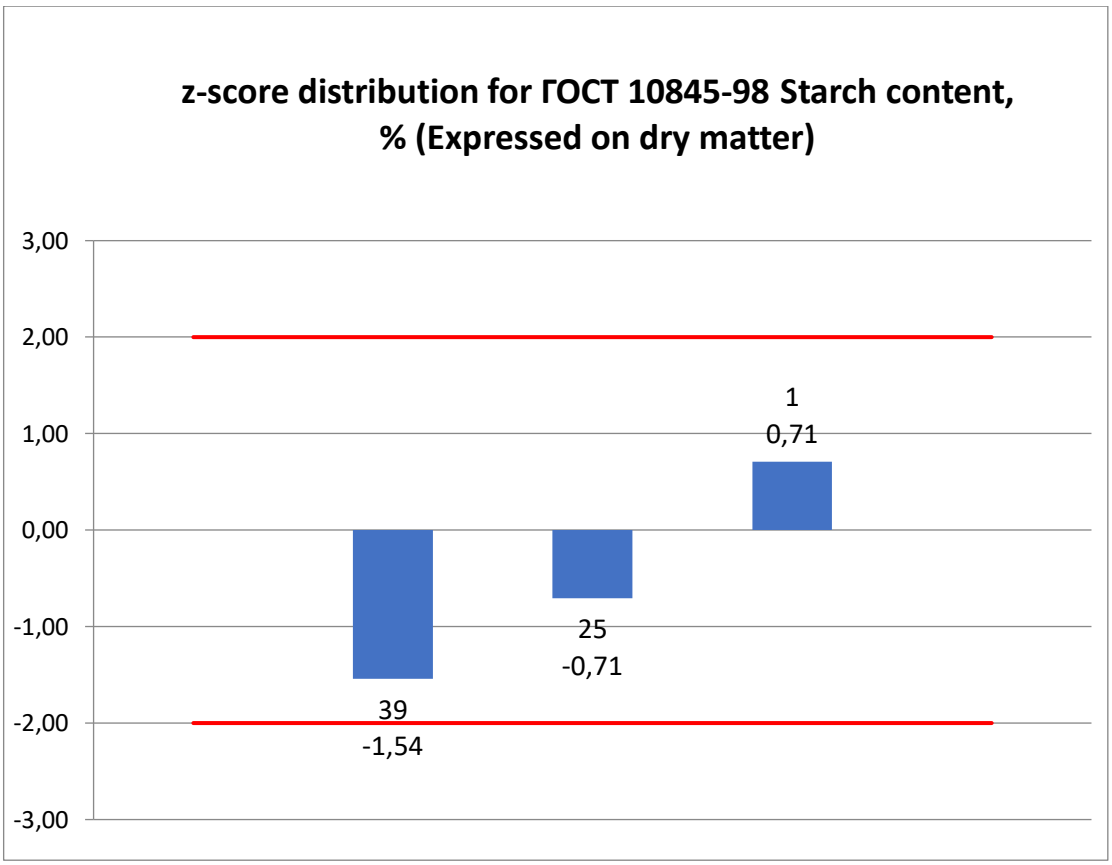
8.34. ДСТУ 8844:2019 Mass fraction of crude fibre, % (Expressed on dry matter)





8.35. ГОСТ 10845-98 Starch content, % (Expressed on dry matter)





9. NORMATIVE REFERENCE

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2. Analytical Methods Committee, Robust Statistics – How not to reject outliers Part 1. Basic Concepts, Analyst, 1989, 114, 1693-1697.

3. Fearn, T. and Thompson, M, A new test for ‘sufficient homogeneity’, Analyst, 2001, 126, 1414-1417.

4. ISO 13528:2022 Statistical methods for use in proficiency testing by interlaboratory comparison.

5. ISO Guide 35:2017 Reference materials – Guidance for characterization and assessment of homogeneity and stability.

6. ILAC Discussion Paper on Homogeneity and Stability Testing, April 2008.