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PROFICIENCY TESTING PT.UA.1.2.2016
MAIZE ANALYSIS (QUALITY)
PROFICIENCY TESTING REPORT
ROUND 3 FEBRUARY 2019 (ENG)

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2. SUMMARY

2.1. The purpose of proficiency testing in wheat testing is to determine the characteristics of the operation (as described in ISO/IEC 17043[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 3 held in February 2019. This report is issued according to ISO/IEC 17043 [1] and PT.UA.1.2.2016 Round 3 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 35 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 17043:2010[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 is proved to be satisfactory for the purposes of PT programme PT.UA.1.2.2016 Round 3. 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 [2-8]. 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*)** were dispatched 28.01.2019 according to schedule of proficiency testing programme PT.UA.1.2.2016 Round 3.

3.3.2. Each produced and identified sample was hermetically sealed.

3.3.3. A total of 35 participants received one sample. Results were returned from 35 participants.

3.4. FOLLOW-UP SERVICES

3.4.1. If a participant wishes 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 [2,3]

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 $|z| \leq 2$ (marked green in tables). z-Scores were deemed questionable if $2 < |z| \leq 3$ (marked yellow in tables). If $|z| \geq 3$, the results were considered to be unsatisfactory (marked red in tables). The calculations were made according to [1,3,5].

3.5.5. Only 0,93% of all results in this round are considered to be unsatisfactory. In Round 2, unsatisfactory results were 1.93%.

3.5.6. None of the participants provided results for «Crude fibre content (Expressed as a mass fraction of the product as received), % (ISO 12099:2017)» and «Ash content (Expressed on dry matter),% (ДСТУ 4117:2007)». Corresponding columns are not presented in tables.

4. HOMOGENITY AND STABILITY ASSESMENT

4.1. Samples were assessed for homogeneity and stability after blending and packing by selecting ten samples of material at random from all those produced. Three of these samples were tested in duplicate under repeatability conditions as only 48 samples were produced according to [7]. Four 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. 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 [3,4].

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 Moisture content, %

Moisture content, %	ISO 6540:1980											
Дослідження гомогенності/Homogeneity test							Аналіз на 'достатню однорідність'/Test for 'sufficient homogeneity'					
Аналіз викидів за тестом Кохрана(C-тест)/Cohran's C test for outliers												
Номер зразку/ Sample number	Результат/ Result A	Результат/ Result B	Average	SD²			Номер зразку/ Sample number	Результат/ Result A	Результат/ Result B	SUM	Difference²	
1	14,11	14,14	14,13	0,0005	0,00		1	14,11	14,14	28,25	0,0009	
2	14,23	14,13	14,18	0,0050	0,00		2	14,23	14,13	28,36	0,0100	
3	14,24	14,05	14,15	0,0180	0,00		3	14,24	14,05	28,29	0,0361	
4	14,09	14,11	14,10	0,0002	0,00		4	14,09	14,11	28,20	0,0004	
5	14,26	14,10	14,18	0,0128	0,00		5	14,26	14,10	28,36	0,0256	
6	14,20	14,20	14,20	0,0000	0,00		6	14,20	14,20	28,40	0,0000	
7	14,14	14,30	14,22	0,0128	0,00		7	14,14	14,30	28,44	0,0256	
											0,0986	
Mean	14,164		Worst pair	0,0180			Mean	14,164				
Max	14,30		SUM of SD²	0,0493			Max	14,30				
Min	14,05		C	0,3661			Min	14,05				
			Ccr, 5%	0,7271								
			Ccr, 1%	0,8376			Analytical variance S²a	0,0070	SD		0,0740	
			Conclusion				Sanal	0,0839	RSDR		0,5223	
			5% PASS				Ssums	0,0073				
			1% PASS				MSb	0,0036				
							Between sample variance S²sam	-0,0017				
Remarks												
1. Cohran's C test is described in ISO 5727-2 and FAPAS protocol, sixth edition, 2002												
2. Test for 'sufficient homogeneity' is performed according to FAPAS protocol, sixth edition, 2002												

Source of op value to use	σp
Use(write '1') Source	
C>13.8%, HORWITZ	0,3764
1 120ppb<C<13.8%, HORWITZ	0,3802
C<120 ppb	3,116143
MASS NEGATIVE POWER for HORWITZ EQUATION(%=2, ppb=9,ppm=)	2
SD	0,0713
Trial SD	3,9800
Target SD chosen	0,3802
σ²all	0,013007
Replicates	7
F1	2,1
F2	1,43
Critical value	0,0374
Between sample variance S²sam	-0,0017
Sufficient homogeneity test	PASS

4.5. Data for all analytes

Method	EN 16378:2013	EN 16378:2013	EN 16378:2013	ISO 6540:1980/ДСТУ ISO 6540:2007	ISO 20483:2013/ДСТУ ISO 20483:2016	ISO 2171:2007/ДСТУ ISO 2171:2009	ISO 6492:1999/ДСТУ ISO 6492:2003	ISO 6865:2000/ДСТУ ISO 6865:2004	ГОСТ 10840-64	ГОСТ 13586.5-93
	Broken grains, %	Grain impurities, %	Miscellaneous impurities, %	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),%	Test weight, g/l	Moisture content, %
Гомогенність та стабільність										
С-тест "Кохрана"										
Critical value(5%,10pairs)=0,602	0,5935	0,3537	0,5239	0,3661	0,2083	0,4455	0,5151	0,4509	0,1818	0,4081
Mean Result	2,0950	0,3657	0,8879	14,1643	8,2014	1,2759	3,1896	2,0127	732,4286	13,9457
Conclusion(Висновок)	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
Analytical variance test(тест аналітичної дисперсії)										
S ² anal	0,0053	0,0065	0,0187	0,0070	0,0034	0,0002	0,0009	0,0006	1,5714	0,0057
Sanal	0,0729	0,0809	0,1366	0,0839	0,0586	0,0135	0,0298	0,0245	1,2536	0,0753
S ² sample	0,0034	0,0037	0	0	0,0086	0,0001	0,0068	0,0010	0	0,0014
σ _p	0,0750	0,0170	0,0362	0,3802	0,2390	0,0492	0,1990	0,0725	3,1400	0,3752
σ _p source	Horwitz	Horwitz	Horwitz	Horwitz	Horwitz	Horwitz	Method Tr. SD	Horwitz	Trial SD	Horwitz
σ ² all	0,0005	0,0000	0,0001	0,0130	0,0051	0,0002	0,0036	0,0005	0,8874	0,0127
Critical value	0,0087	0,0094	0,0269	0,0374	0,0157	0,0007	0,0088	0,0019	4,1106	0,0347
Conclusion(Висновок)	PASS	PASS	PASS	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 6540:1980/ICTY ISO 6540:2007	ISO 20483:2013/ICTY ISO 20483:2016	ISO 16634-2:2016	ISO 12099:2017	ISO 2171:2007/ICTY ISO 2171:2009	ISO 6492:1999/ICTY ISO 6492:2003	ISO 12099:2017
	Broken grains, %	Grain impurities, %	Miscellaneous impurities, %	Broken grains, %	Damaged grains, %	Other grains, %	Miscellaneous impurities, %	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),%
No of Results	15	15	15	5	5	5	5	14	10	2	3	11	9	2
No of Results z >3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
No of Results z >3, %	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Mean	2,296	0,426	1,007	2,356	0,454	0,056	1,128	14,153	8,128	8,340	8,093	1,260	3,484	3,475
Min	1,800	0,050	0,400	2,000	0,240	0,030	0,920	13,790	7,900	8,280	8,000	1,120	3,320	3,450
Max	2,600	0,710	1,420	2,620	0,740	0,070	1,540	14,330	8,330	8,400	8,150	1,330	3,730	3,500
SD	0,218	0,185	0,263	0,241	0,227	0,015	0,252	0,135	0,136	0,085	0,081	0,062	0,161	0,035
Median	2,320	0,430	1,100	2,440	0,400	0,060	1,100	14,150	8,140	8,340	8,130	1,270	3,400	3,475
Robust mean(assigned value)	2,311	0,432	1,022	2,356	0,454	0,057	1,116	14,167	8,131	8,340	8,093	1,266	3,484	3,475
Robust SD	0,186	0,166	0,218	0,241	0,227	0,013	0,227	0,096	0,130	0,085	0,081	0,050	0,160	0,035
SD from method(Tr.SD)	0,740	0,930	0,850	0,609	0,509	0,102	0,918	N/A	0,140	0,330	N/A	0,033	0,199	N/A
SD from Horwitz eq.	0,081	0,020	0,041	0,083	0,020	0,004	0,044	0,376	0,237	0,242	0,236	0,049	0,115	0,115
Target SD	0,246	0,279	0,336	0,241	0,227	0,015	0,227	0,376	0,140	0,242	0,081	0,049	0,138	0,115
Source of target SD of PT	Trial SD	Trial SD	Trial SD	Trial SD	Trial SD	Trial SD	Trial SD	Horwitz	Method Tr SD	Horwitz	Trial SD	Horwitz	Trial SD	Horwitz

Method	ISO 6865:2000/ICTY ISO 6865:2004	USDA(Grain Grading Procedures, Chapter 4 - Corn April 11, 2017)	USDA(Grain Grading Procedures, Chapter 4 - Corn April 11, 2017)	USDA (Grain Grading Procedures, Chapter 4 - Corn April 11, 2017)	USDA(Grain Grading Procedures, Chapter 1 - General Information July 30, 2013)	ГОСТ 10840-64	ГОСТ 30483-97/ICTY 4525:2006	ГОСТ 30483-97/ICTY 4525:2006	ГОСТ 13586.5-93	ICTY 4117:2007	ICTY 7169:2010	ГОСТ 10847-74	ГОСТ 13496.15-97	ГОСТ 13496.2-91
	Crude fibre content (Expressed as a mass fraction of the product as received),%	Broken Corn, %	Foreign Material, %	Damaged kernels, %	Test weight, lbu/bu	Test weight, g/l	Foreign impurities, %	Grain impurities, %	Moisture content, %	Moisture content, %	Mass fraction of crude protein (Expressed on dry matter, factor for converting nitrogen content to protein content - 6.0),%	Ash content (Expressed on dry matter),%	Mass fraction of crude fat (Expressed on dry matter),%	Mass fraction of crude fibre (Expressed on dry matter),%
No of Results	10	10	10	10	9	19	31	31	33	10	12	5	9	9
No of Results z > 3	0	0	0	0	0	1	0	0	0	0	1	0	1	0
No of Results z > 3, %	0,000	0,000	0,000	0,000	0,000	5,263	0,000	0,000	0,000	0,000	8,333	0,000	11,111	0,000
Mean	1,780	2,693	0,593	0,968	57,957	734,668	0,876	3,314	13,795	13,965	7,748	1,228	3,896	1,750
Min	1,450	2,500	0,440	0,530	56,000	723,000	0,410	2,020	13,400	13,800	6,630	1,160	2,976	0,700
Max	2,040	2,880	0,850	1,380	59,900	778,700	1,260	6,000	14,100	14,150	7,990	1,330	4,160	2,750
SD	0,218	0,122	0,137	0,253	1,316	12,036	0,210	0,958	0,179	0,116	0,372	0,071	0,359	0,619
Median	1,820	2,710	0,570	0,910	57,400	732,000	0,900	2,880	13,800	14,000	7,845	1,240	4,000	1,820
Robust mean(assigned value)	1,780	2,694	0,586	0,971	57,957	732,763	0,883	3,242	13,801	13,963	7,817	1,228	3,963	1,757
Robust SD	0,217	0,119	0,124	0,228	1,316	6,033	0,176	0,808	0,142	0,113	0,164	0,071	0,174	0,557
SD from method(Tr.SD)	0,180	N/A	N/A	N/A	N/A	N/A	0,300	1,000	0,700	N/A	N/A	N/A	N/A	N/A
SD from Horwitz eq.	0,065	0,093	0,025	0,039	N/A	N/A	0,036	0,109	0,371	0,374	0,229	0,048	0,129	0,065
Target SD	0,180	0,106	0,124	0,228	1,387	4,600	0,300	1,000	0,371	0,374	0,229	0,048	0,129	0,557
Source of target SD of PT	Method Tr SD	Trial SD	Trial SD	Trial SD	Trial SD	Trial SD	Method Tr SD	Method Tr SD	Horwitz	Horwitz	Horwitz	Horwitz	Horwitz	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 6540:1980/ICTY ISO 6540:2007	ISO 20483:2013/ICTY ISO 20483:2016	ISO 16634-2:2016	ISO 12099:2017	ISO 2171:2007/ICTY ISO 2171:2009	ISO 6492:1999/ICTY ISO 6492:2003	ISO 12099:2017	ISO 6865:2000/ICTY ISO 6865:2004
Laboratory number	Broken grains, %	Grain impurities, %	Miscellaneous impurities, %	Broken grains, %	Damaged grains, %	Other grains, %	Miscellaneous impurities, %	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),%	Crude fibre content (Expressed as a mass fraction of the product as received),%
1	2,19	0,43	0,89	2,24	0,40	0,03	0,93	14,10	8,22	8,28		1,27	3,32		1,91
2															
3	2,50	0,52	1,42	2,62	0,74	0,06	1,54	14,11	8,14			1,32	3,52		1,64
4	1,80	0,27	1,10	2,00	0,64	0,07	1,15	14,33	8,12		8,13	1,27	3,65	3,50	1,53
5	2,60	0,29	1,16					14,33			8,15			3,45	
6	2,40	0,70	1,27					14,15	8,14			1,29	3,40		1,91
7	2,41	0,64	1,24					14,25	8,20			1,26	3,36		2,04
8	2,26	0,47	0,77					13,79							
9	2,50	0,40	1,00	2,44	0,25	0,06	0,92	14,05	7,93	8,40		1,20	3,73		2,00
10	2,50	0,30	1,12	2,48	0,24	0,06	1,10	14,10	7,90		8,00	1,12			2,00
11															
12															
13															
14															
15	2,15	0,35	1,11					14,12	8,33			1,32	3,67		1,45
16															
18	2,43	0,45	1,12					14,15	8,05			1,27	3,34		1,73
19	2,28	0,58	1,07					14,20							
20															
21	2,10	0,23	0,70												
22															
23	2,00	0,71	0,40					14,21							
24	2,32	0,05	0,74					14,25	8,25			1,33	3,37		1,59
25												1,21 ± 0,09			
27															
28															
29															
30															
31															
32															
33															
34															
35															
36															
37															

Method	ISO 12099:2017	USDA(Grain Grading Procedures, Chapter 4 - Corn April 11, 2017)	USDA(Grain Grading Procedures, Chapter 4 - Corn April 11, 2017)	USDA (Grain Grading Procedures, Chapter 4 - Corn April 11, 2017)	USDA(Grain Grading Procedures, Chapter 1 - General Information July 30, 2013)	ГОСТ 10840-64	ГОСТ 30483-97/ДСТУ 4525:2006	ГОСТ 30483-97/ДСТУ 4525:2006	ГОСТ 13586.5-93	ДСТУ 4117:2007	ДСТУ 7169:2010	ГОСТ 10847-74	ДСТУ 4117:2007	ГОСТ 13496.15-97	ГОСТ 13496.2-91
Laboratory number	Crude fibre content (Expressed as a mass fraction of the product as received),%	Broken Corn, %	Foreign Material, %	Damaged kernels, %	Test weight, lbu/bu	Test weight, g/l	Foreign impurities, %	Grain impurities, %	Moisture content, %	Moisture content, %	Mass fraction of crude protein (Expressed on dry matter, factor for converting nitrogen content to protein content - 6.0),%	Ash content (Expressed on dry matter),%	Ash content (Expressed on dry matter),%	Mass fraction of crude fat (Expressed on dry matter),%	Mass fraction of crude fibre (Expressed on dry matter),%
1		2,55	0,63	1,15	56,88	732,00	0,90	2,61	13,88		7,87	1,25		3,86	2,16
2						746,00	0,78	2,88	13,80	13,90					
3						733	1,06	3,08	13,74		7,82				
4		2,50	0,44	0,81	59,0	727	1,20	2,17	13,97		7,99	1,24		4,16	1,76
5		2,88	0,50	1,38		730,00	1,00	4,79	14,10						
6		2,70	0,85	0,80	59,00										
7		2,78	0,78	0,82	59,10										
8						778,70	0,95	2,80	13,60	13,80					
9		2,56	0,63	1,20	57,40	739,00	1,02	2,76	13,70		7,70	1,16		4,00	1,06
10		2,72	0,63	1,17	57,30	738,00	0,91	2,66	13,80	14,00	7,70	1,16		4,00	0,70
11									13,80		7,64			3,95	2,04
12							0,85	2,64	13,80	14,00					
13						730,00	0,62	2,40	13,40		6,630			2,976	2,072
14							0,60	2,90	14,1	13,8					
15		2,77	0,47	0,97	56	727	1,26	2,61	13,40		7,97			4,15	1,82
16						733	0,8	2,7	13,8	13,9					
18						734,00	1,00	3,00	13,80						
19		2,79	0,51	0,85	57,03	734,00	0,92	2,74	13,90	14,00					
20						728			13,75	14,15	7,82				
21						732,00	0,43	2,23	14,05		7,95				
22							0,86	2,69	13,90	14,00					
23						728,00	0,72	3,82	14,00	14,10					
24		2,68	0,49	0,53	59,90	740,00	1,16	2,02	13,90		7,92	1,33		3,92	1,39
25						726 ± 0,02	0,41 ± 0,02	2,88 ± 0,10	13,54 ± 0,04		7,97 ± 0,35			4,05± 0,54	2,75± 0,87
27							0,98	4,02	13,70						
28							0,80	6,00	13,70						
29							0,74	4,78	13,80						
30							1,05	3,70	13,50						
31							0,80	4,70	13,70						
32							0,95	4,12	13,80						
33							0,84	4,76	13,80						
34							0,76	3,84	13,80						
35							1,00	3,90	13,90						
36							0,59	2,74	14,10						
37						723,00	1,20	3,80	13,70						

7. Z SCORES

Method	EN 16378:2013	EN 16378:2013	EN 16378:2013	ISO 19942:2018	ISO 19942:2018	ISO 19942:2018	ISO 19942:2018	ISO 6540:1980/ДСТУ ISO 6540:2007	ISO 20483:2013/ДСТУ ISO 20483:2016	ISO 16634-2:2016	ISO 12099:2017	ISO 2171:2007/ДСТУ ISO 2171:2009	ISO 6492:1999/ДСТУ ISO 6492:2003	ISO 12099:2017
Laboratory number	Broken grains, %	Grain impurities, %	Miscellaneous impurities, %	Broken grains, %	Damaged grains, %	Other grains, %	Miscellaneous impurities, %	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),%
1	-0,49	-0,01	-0,39	-0,48	-0,24	-1,81	-0,82	-0,18	0,63	-0,25		0,08	-1,19	
2														
3	0,77	0,31	1,18	1,10	1,26	0,19	1,87	-0,15	0,06			1,11	0,26	
4	-2,08	-0,58	0,23	-1,48	0,82	0,85	0,15	0,43	-0,08		0,45	0,08	1,20	0,22
5	1,17	-0,51	0,41					0,43			0,70			-0,22
6	0,36	0,96	0,74					-0,05	0,06			0,49	-0,61	
7	0,40	0,74	0,65					0,22	0,49			-0,12	-0,90	
8	-0,21	0,14	-0,75					-1,00						
9	0,77	-0,12	-0,07	0,35	-0,90	0,19	-0,86	-0,31	-1,44	0,25		-1,35	1,78	
10	0,77	-0,47	0,29	0,51	-0,94	0,19	-0,07	-0,18	-1,65		-1,15	-2,99		
11														
12														
13														
14														
15	-0,66	-0,29	0,26					-0,13	1,42			1,11	1,35	
16														
18	0,48	0,06	0,29					-0,05	-0,58			0,08	-1,04	
19	-0,13	0,53	0,14					0,09						
20														
21	-0,86	-0,73	-0,96											
22														
23	-1,27	1,00	-1,85					0,11						
24	0,03	-1,37	-0,84					0,22	0,85			1,31	-0,82	
25												-1,14		
27														
28														
29														
30														
31														
32														
33														
34														
35														
36														
37														

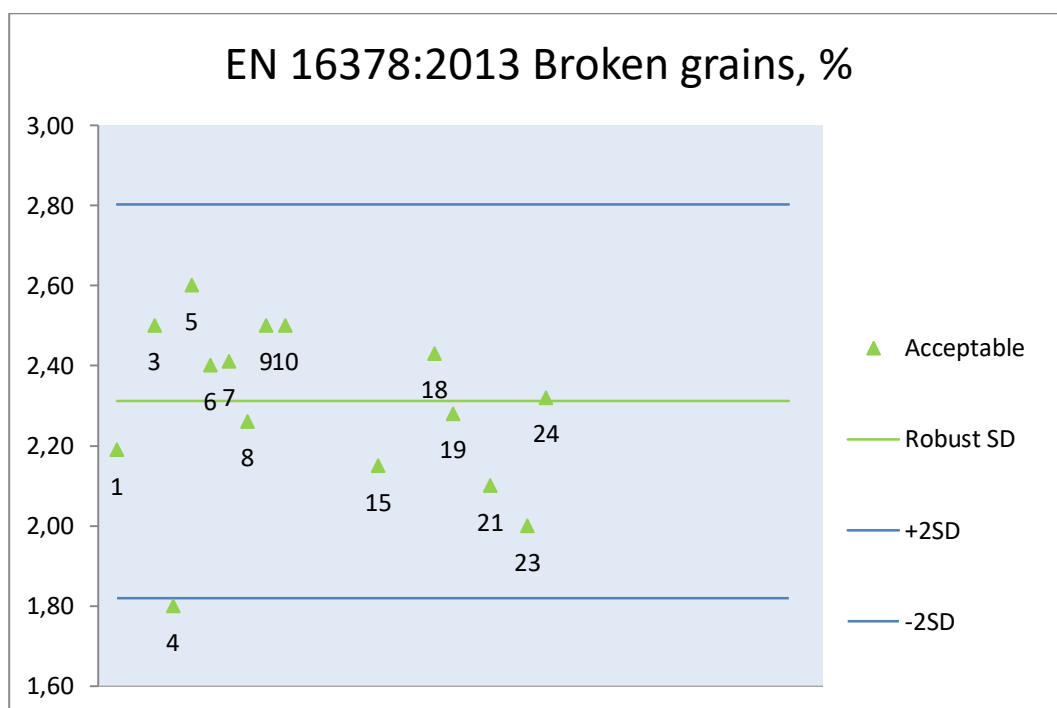
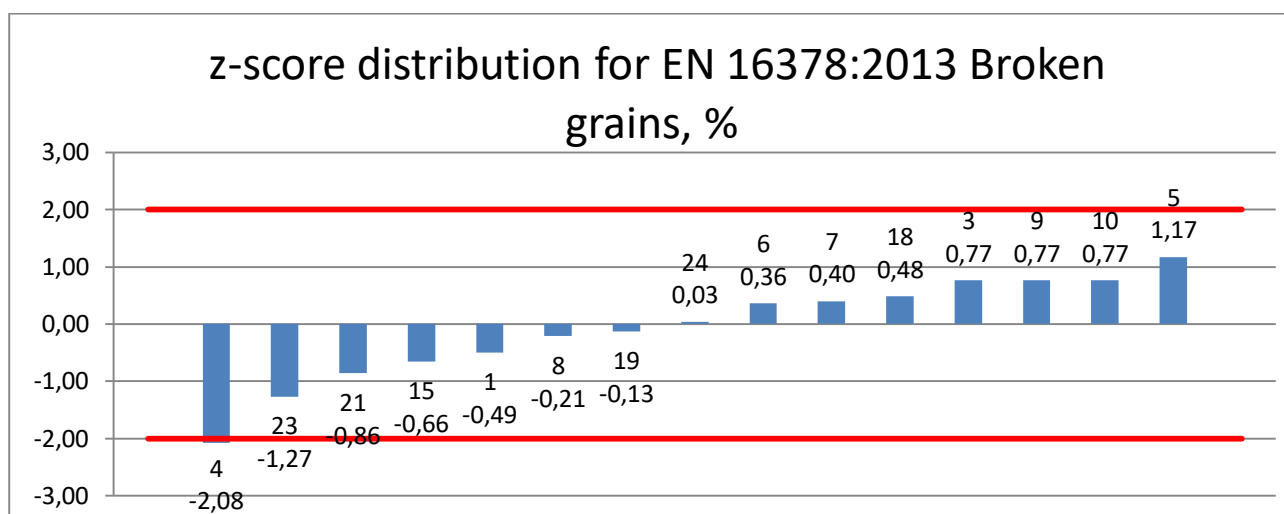
Method	ISO 6865:2000/ICTY ISO 6865:2004	USDA(Grain Grading Procedures, Chapter 4 - Corn April 11, 2017)	USDA(Grain Grading Procedures, Chapter 4 - Corn April 11, 2017)	USDA (Grain Grading Procedures, Chapter 4 - Corn April 11, 2017)	USDA(Grain Grading Procedures, Chapter 1 - General Information July 30, 2013)	ГОСТ 10840-64	ГОСТ 30483-97/ICTY 4525:2006	ГОСТ 30483-97/ICTY 4525:2006	ГОСТ 13586.5-93	ICTY 4117:2007	ICTY 7169:2010	ГОСТ 10847-74	ГОСТ 13496.15-97	ГОСТ 13496.2-91
Laboratory number	Crude fibre content (Expressed as a mass fraction of the product as received),%	Broken Corn, %	Foreign Material, %	Damaged kernels, %	Test weight, lbu/bu	Test weight, g/l	Foreign impurities, %	Grain impurities, %	Moisture content, %	Moisture content, %	Mass fraction of crude protein (Expressed on dry matter, factor for converting nitrogen content to protein content - 6.0),%	Ash content (Expressed on dry matter),%	Mass fraction of crude fat (Expressed on dry matter),%	Mass fraction of crude fibre (Expressed on dry matter),%
1	0,72	-1,36	0,36	0,78	-0,78	-0,17	0,06	-0,63	0,21		0,23	0,46	-0,80	0,72
2						2,88	-0,34	-0,36	0,00	-0,17				
3	-0,78					0,05	0,59	-0,16	-0,16		0,01			
4	-1,39	-1,83	-1,18	-0,71	0,75	-1,25	1,06	-1,07	0,45		0,75	0,25	1,53	0,01
5		1,76	-0,69	1,79		-0,60	0,39	1,55	0,80					
6	0,72	0,06	2,13	-0,75	0,75									
7	1,44	0,81	1,57	-0,66	0,82									
8						9,99	0,22	-0,44	-0,54	-0,44				
9	1,22	-1,26	0,36	1,00	-0,40	1,36	0,46	-0,48	-0,27		-0,51	-1,43	0,28	-1,25
10	1,22	0,25	0,36	0,87	-0,47	1,14	0,09	-0,58	0,00	0,10	-0,51	-1,43	0,28	-1,90
11									0,00		-0,77		-0,10	0,51
12							-0,11	-0,60	0,00	0,10				
13						-0,60	-0,88	-0,84	-1,08		-5,18		-7,66	0,57
14							-0,94	-0,34	0,80	-0,44				
15	-1,84	0,72	-0,93	0,00	-1,41	-1,25	1,26	-0,63	-1,08		0,67		1,45	0,11
16						0,05	-0,28	-0,54	0,00	-0,17				
18	-0,28					0,27	0,39	-0,24	0,00					
19		0,91	-0,61	-0,53	-0,67	0,27	0,12	-0,50	0,27	0,10				
20						-1,04			-0,14	0,50	0,01			
21						-0,17	-1,51	-1,01	0,67		0,58			
22							-0,08	-0,55	0,27	0,10				
23						-1,04	-0,54	0,58	0,54	0,37				
24	-1,06	-0,13	-0,77	-1,93	1,40	1,57	0,92	-1,22	0,27		0,45	2,14	-0,34	-0,66
25						-1,47	-1,58	-0,36	-0,70		0,67		0,67	1,78
27							0,32	0,78	-0,27					
28							-0,28	2,76	-0,27					
29							-0,48	1,54	0,00					
30							0,56	0,46	-0,81					
31							-0,28	1,46	-0,27					
32							0,22	0,88	0,00					
33							-0,14	1,52	0,00					
34							-0,41	0,60	0,00					
35							0,39	0,66	0,27					
36							-0,98	-0,50	0,80					
37						-2,12	1,06	0,56	-0,27					

Remarks

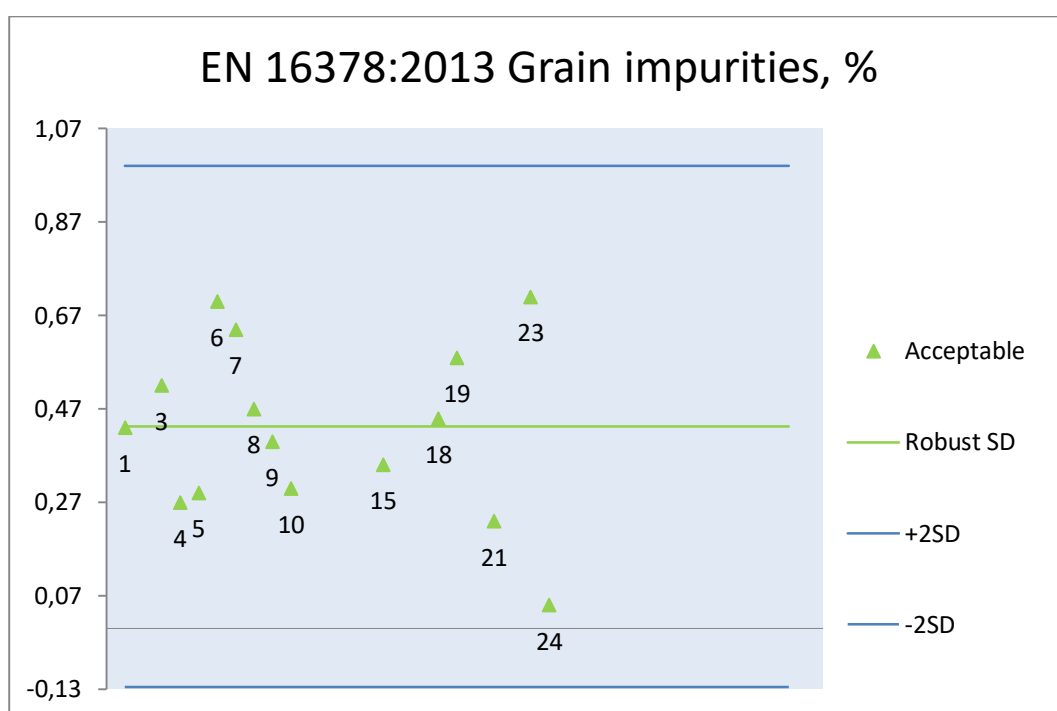
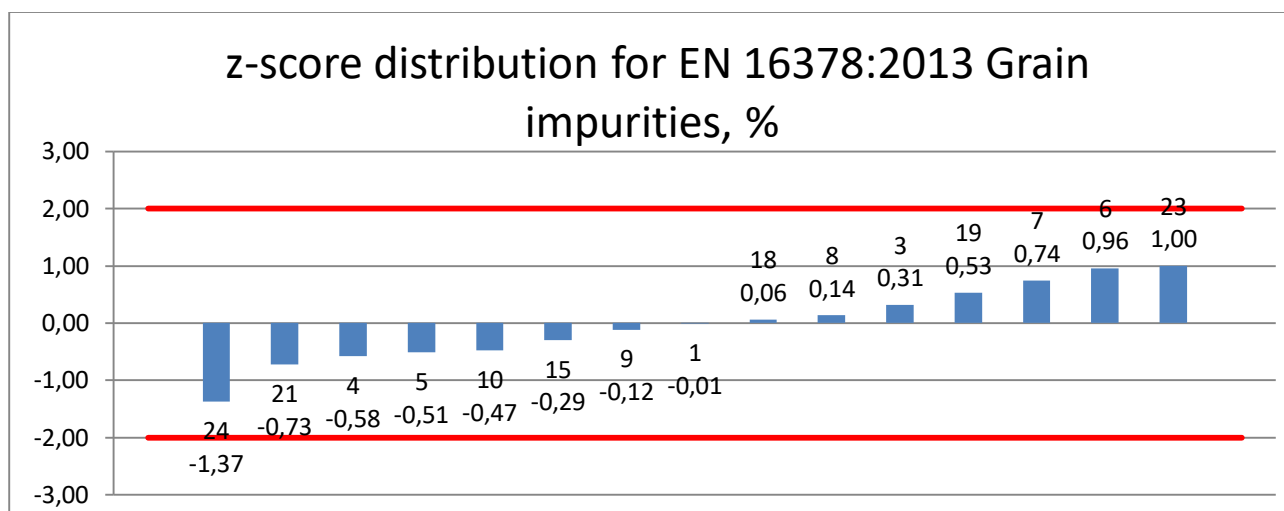
1. Green colored cells contain results that are considered to be satisfactory.
2. Red colored cells contain results that are considered to be not satisfactory.
3. Results that are considered to be questionable are marked by yellow colored cell.
4. Blank cell – results were not reported by the Participants.

8. Z SCORE PLOTS AND RESULTS CHARTS.

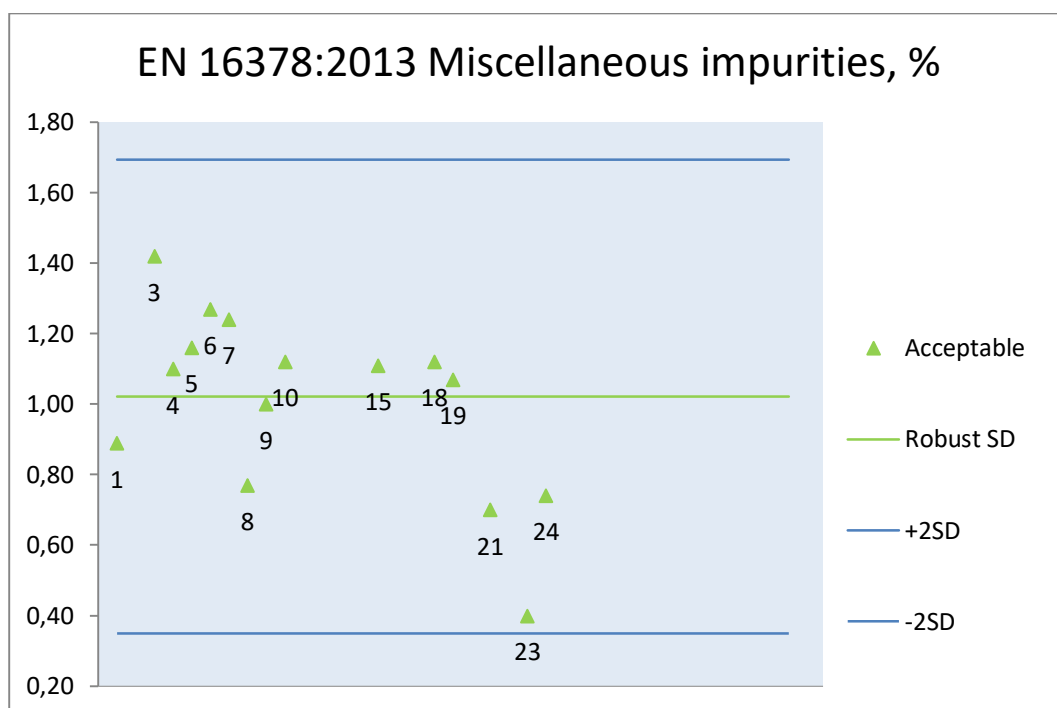
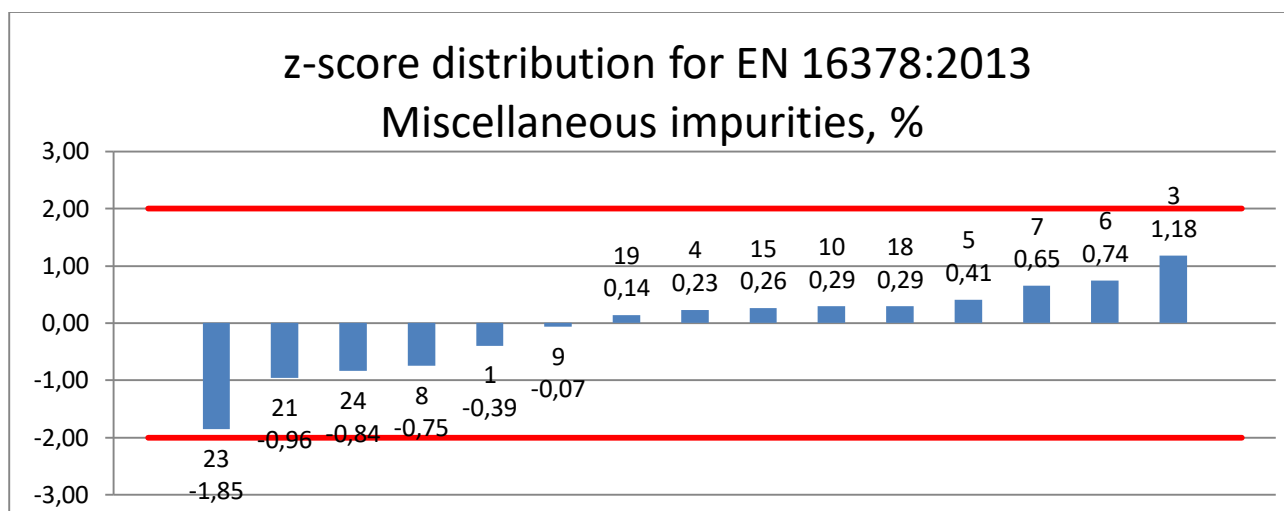
8.1. EN 16378:2013 Broken grains, %



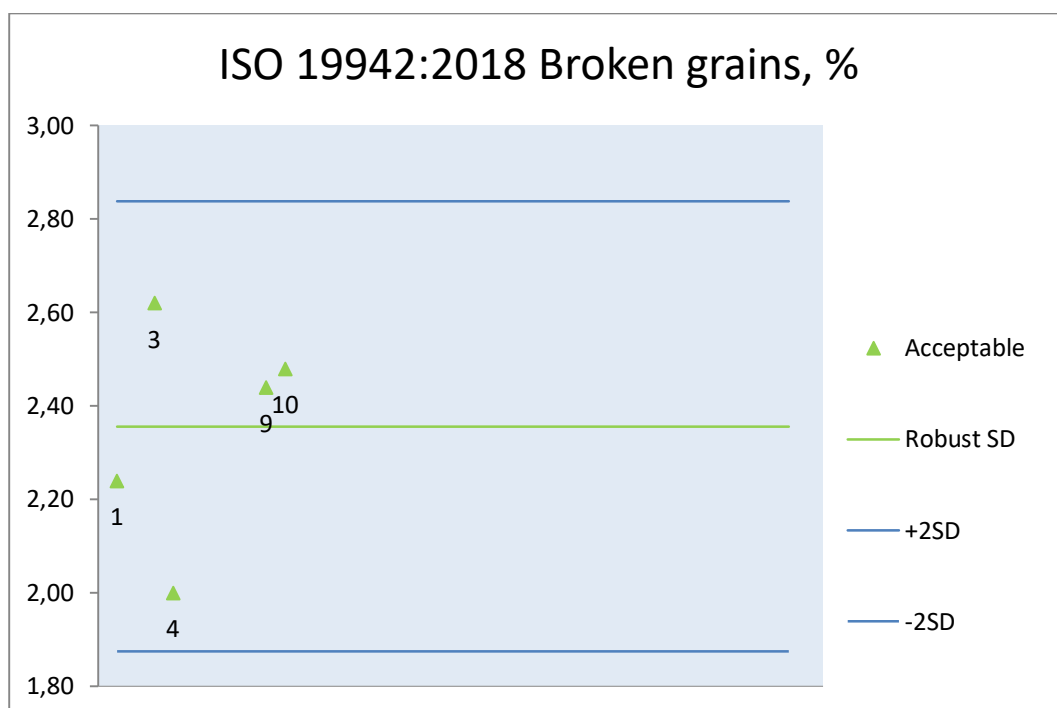
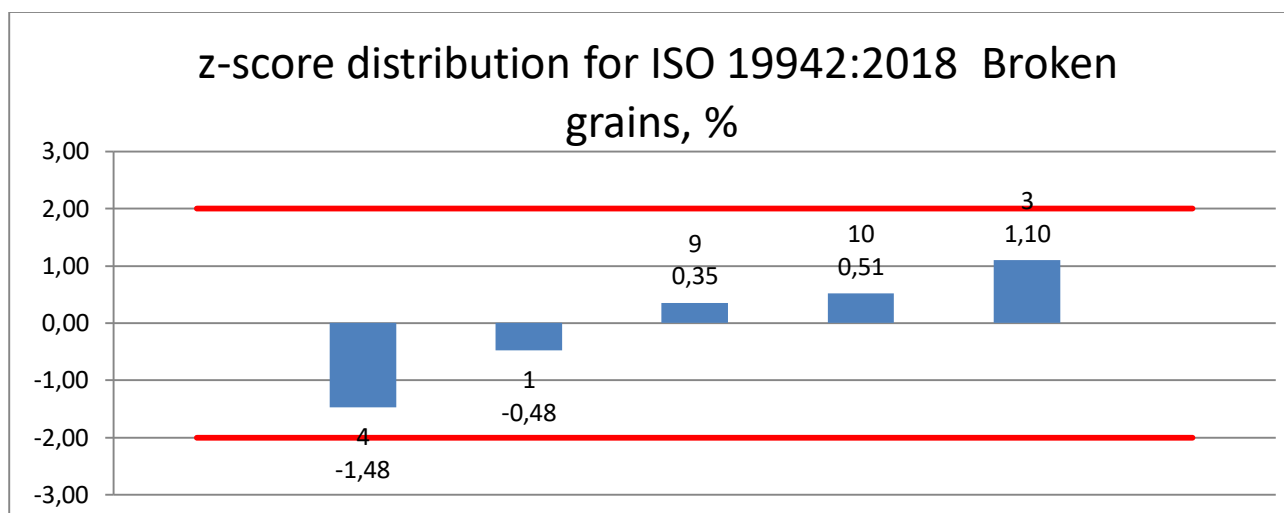
8.2. EN 16378:2013 Grain impurities, %



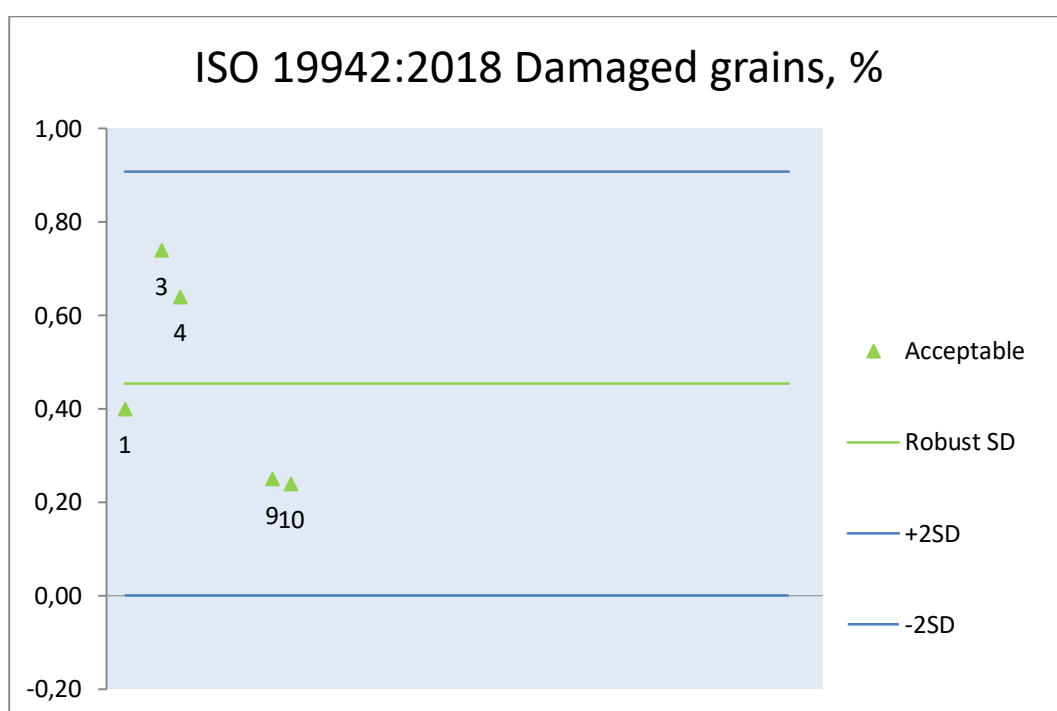
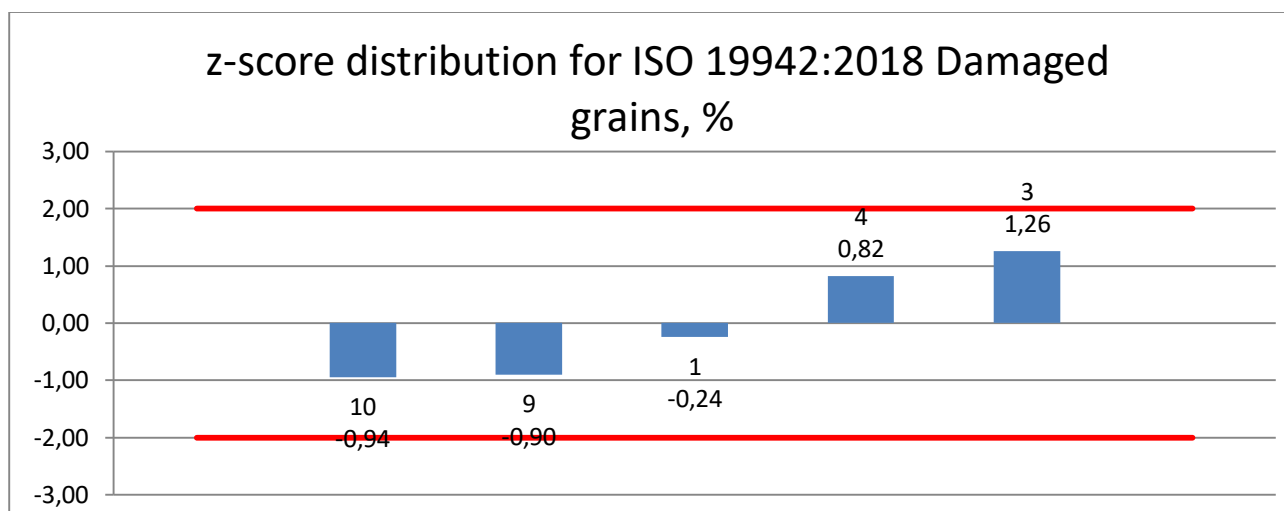
8.3. EN 16378:2013 Miscellaneous impurities, %



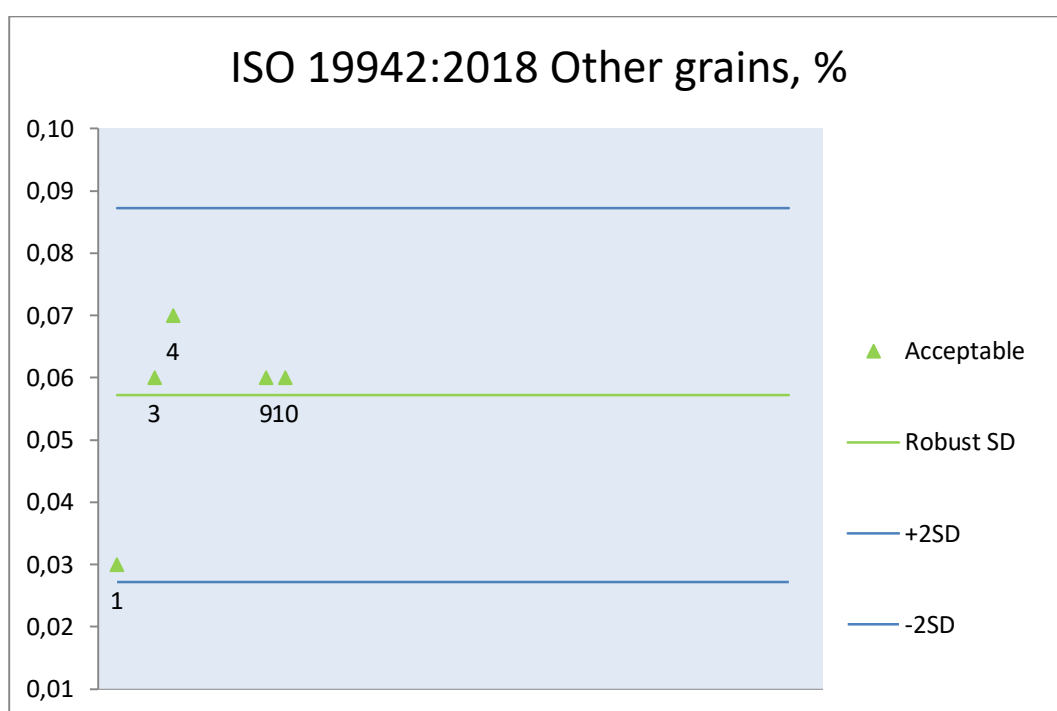
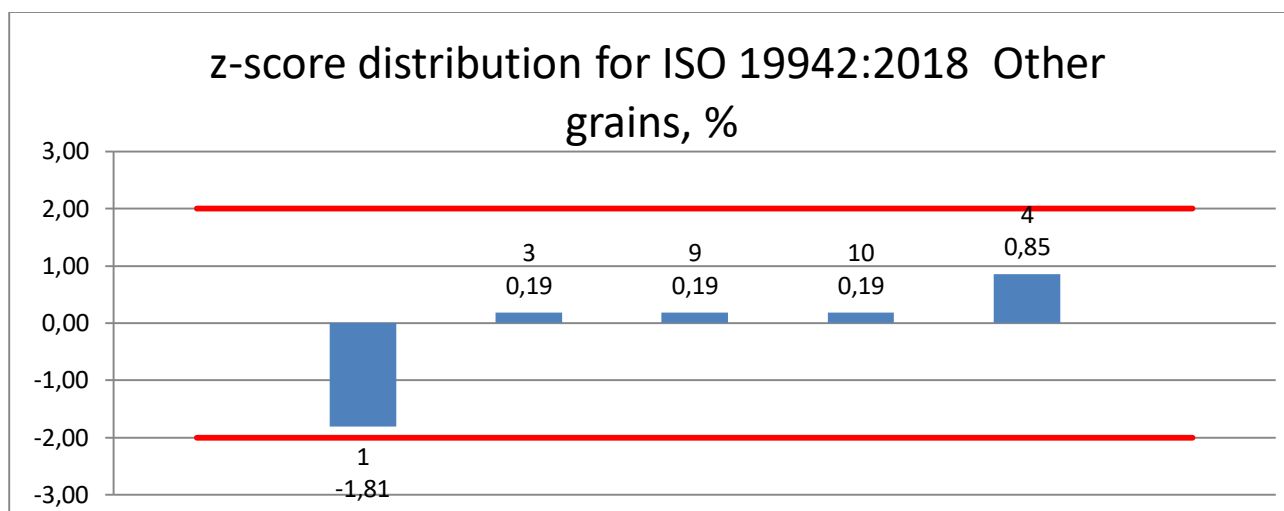
8.4. ISO 19942:2018 Broken grains, %



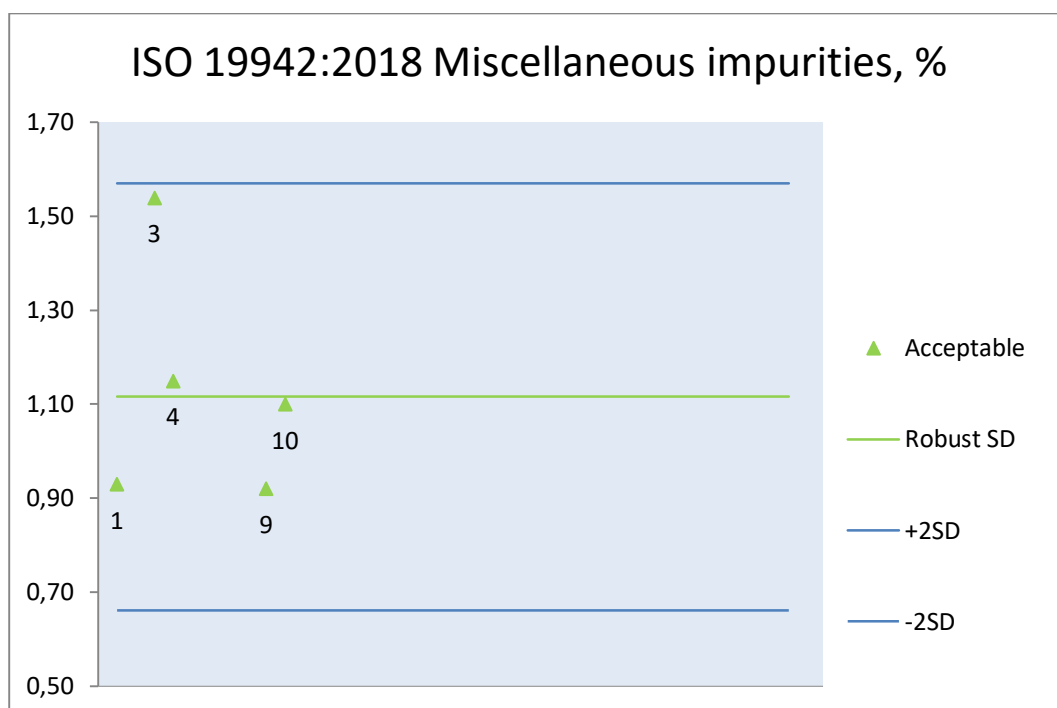
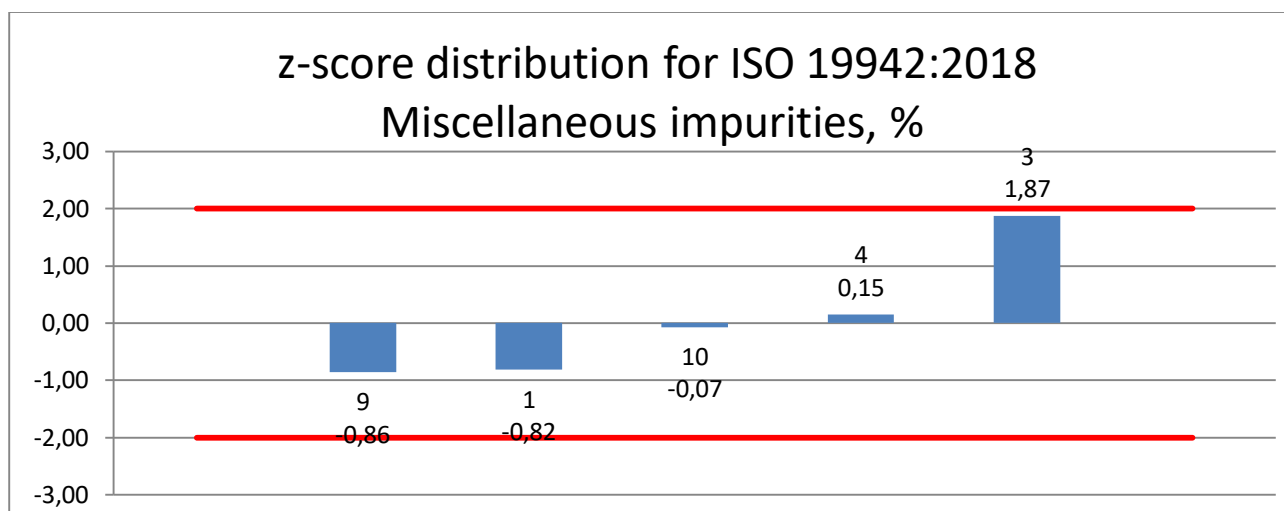
8.5. ISO 19942:2018 Damaged grains, %



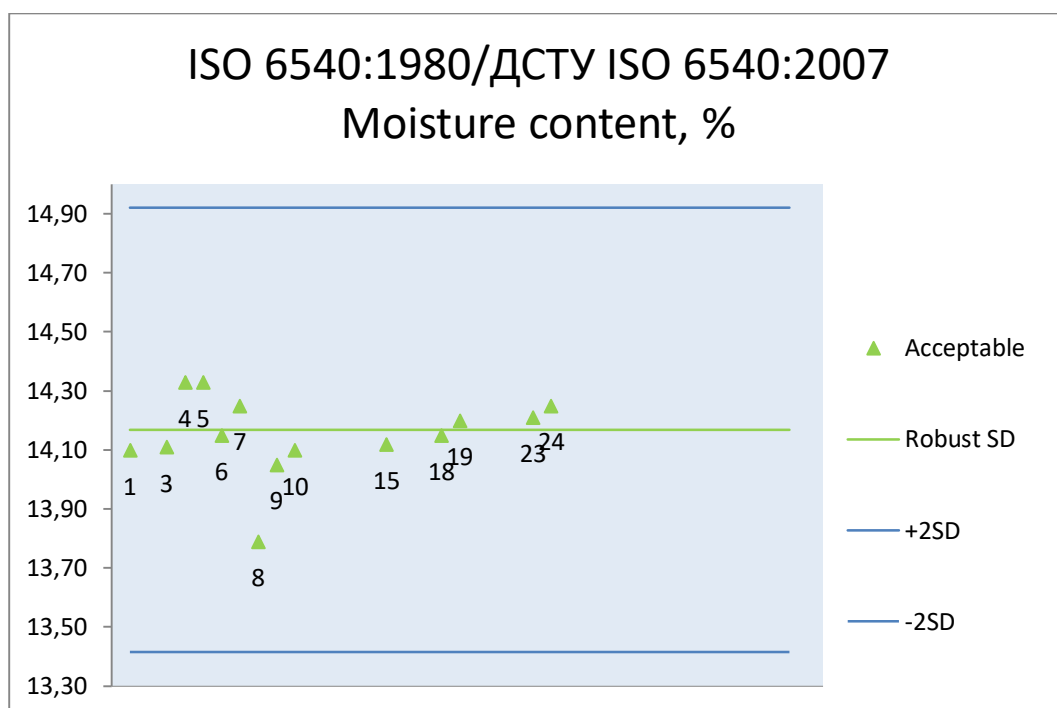
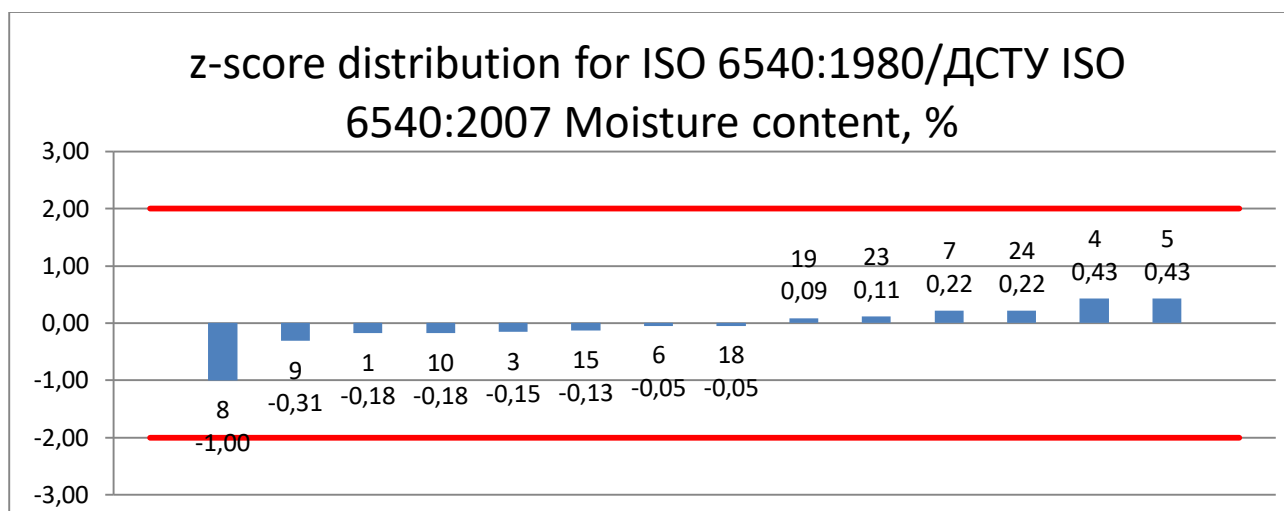
8.6. ISO 19942:2018 Other grains, %



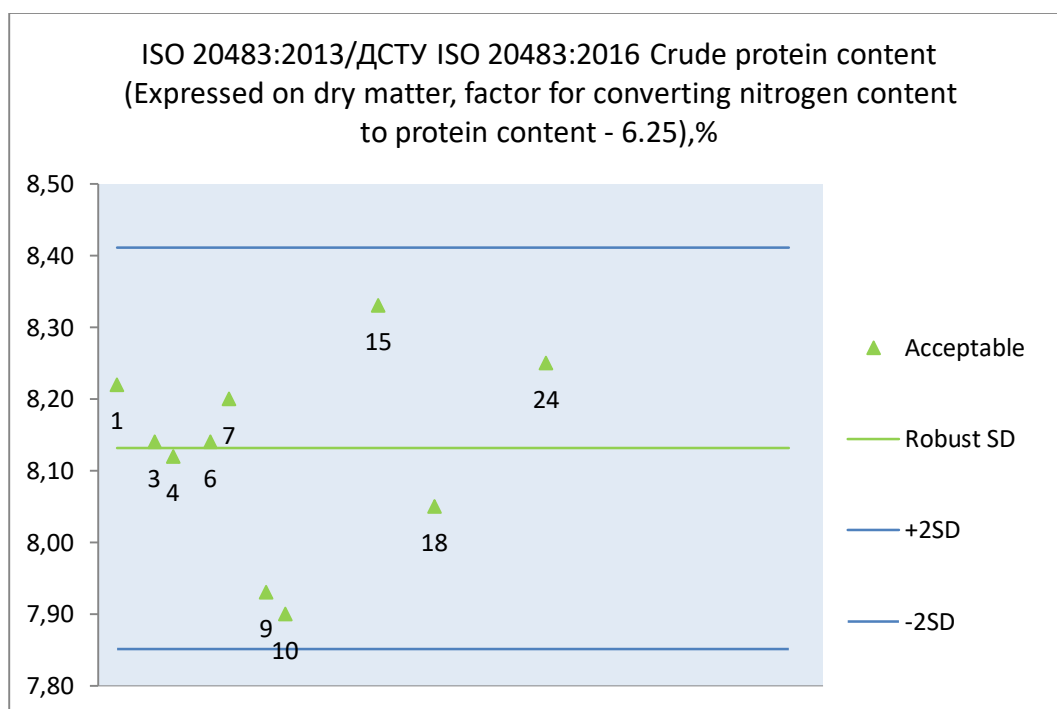
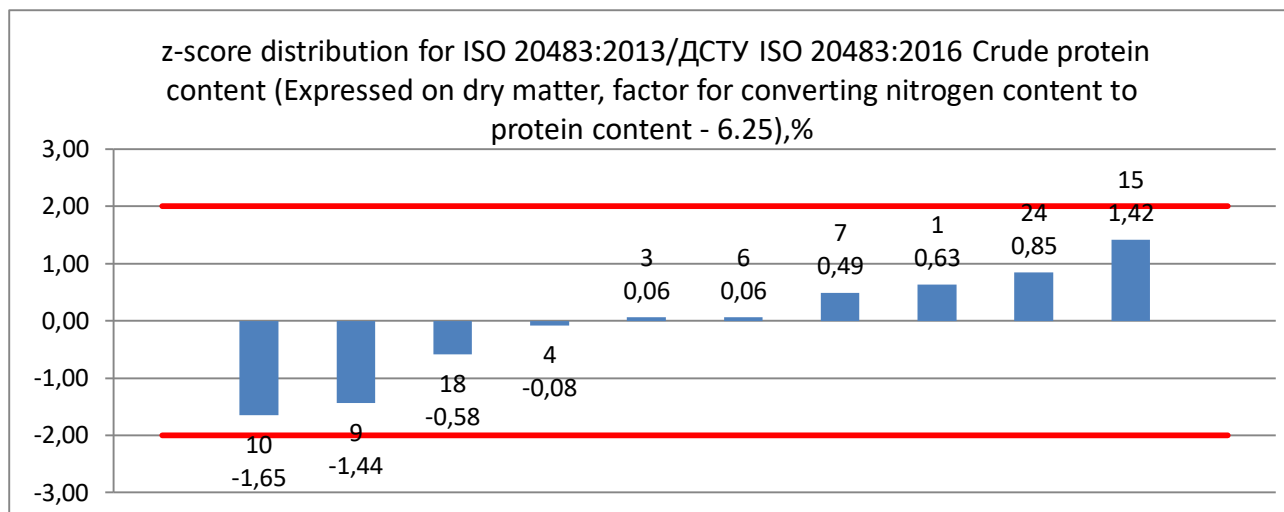
8.7. ISO 19942:2018 Miscellaneous impurities, %



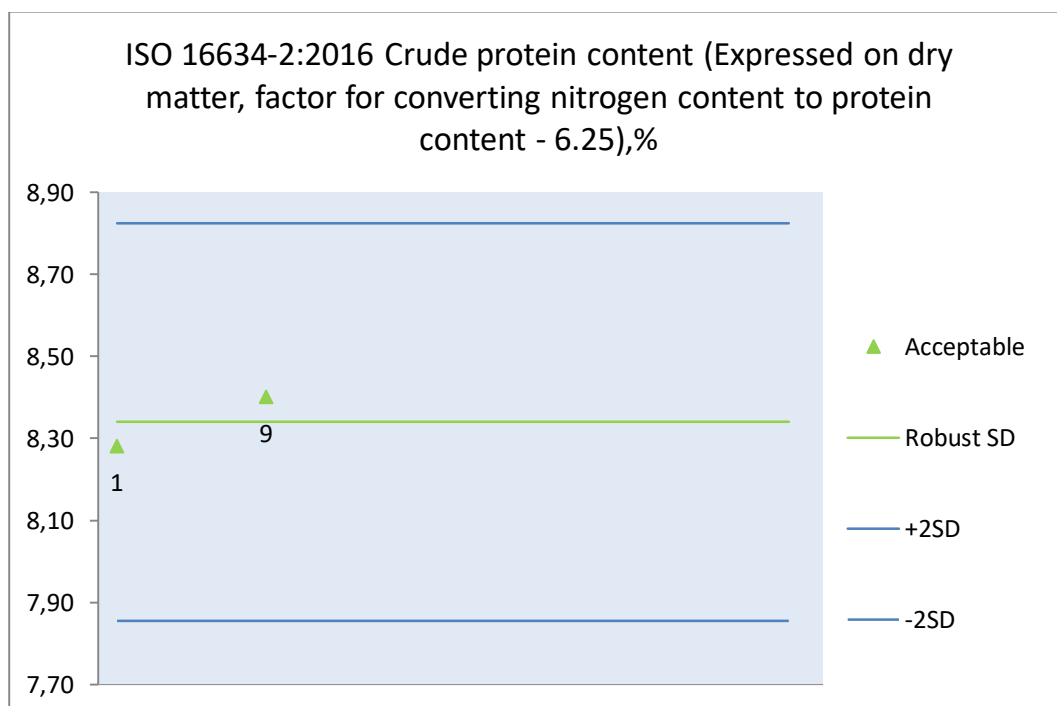
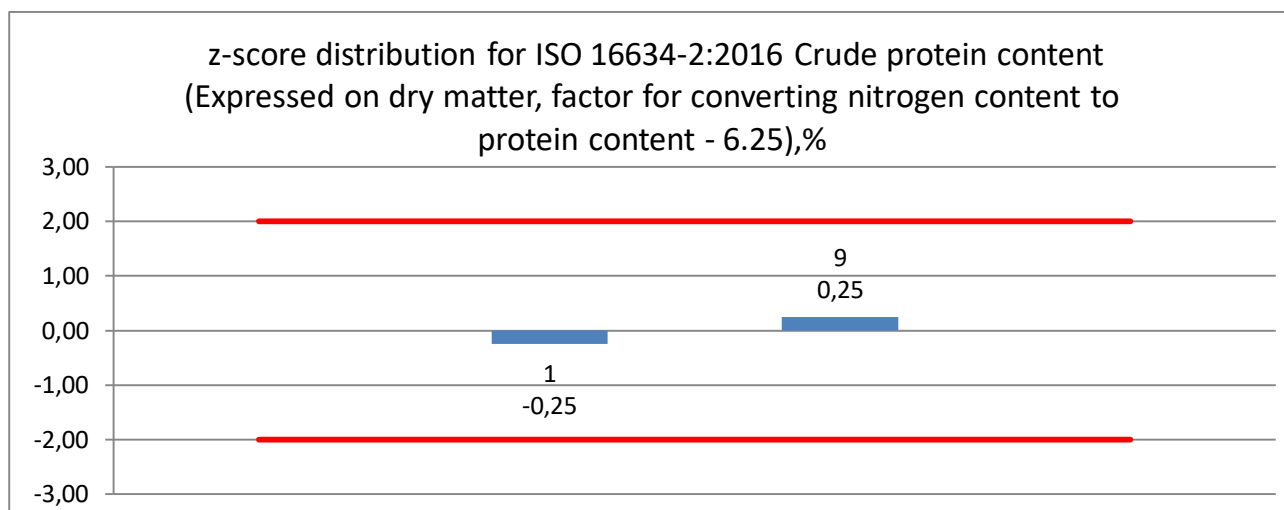
8.8. ISO 6540:1980/ДСТУ ISO 6540:2007 Moisture content, %



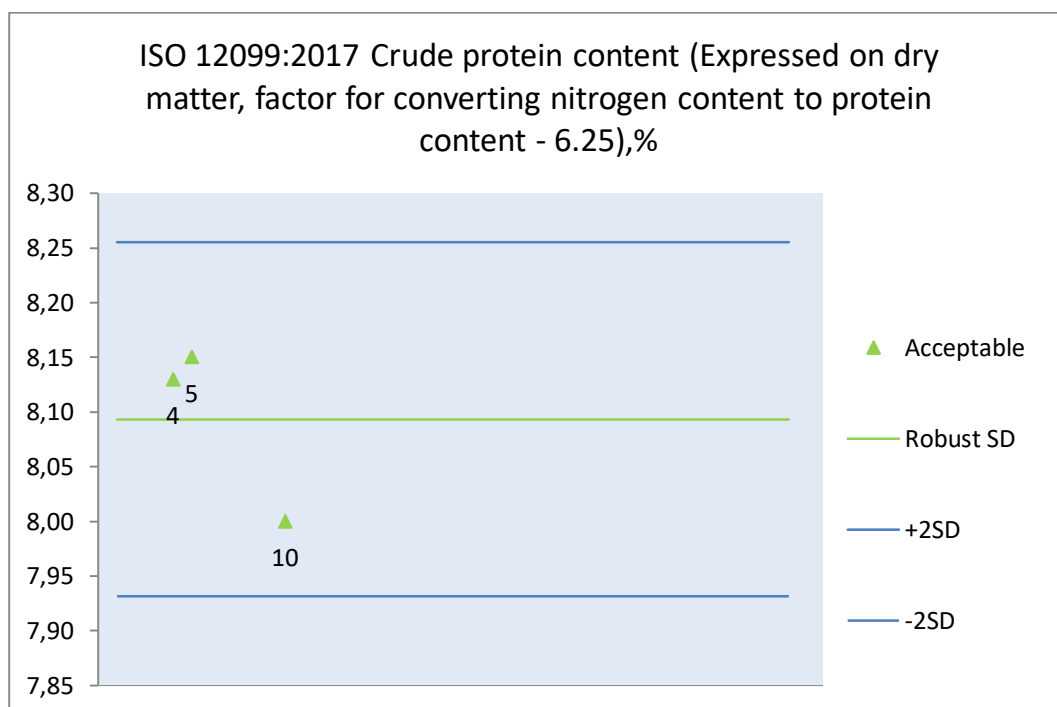
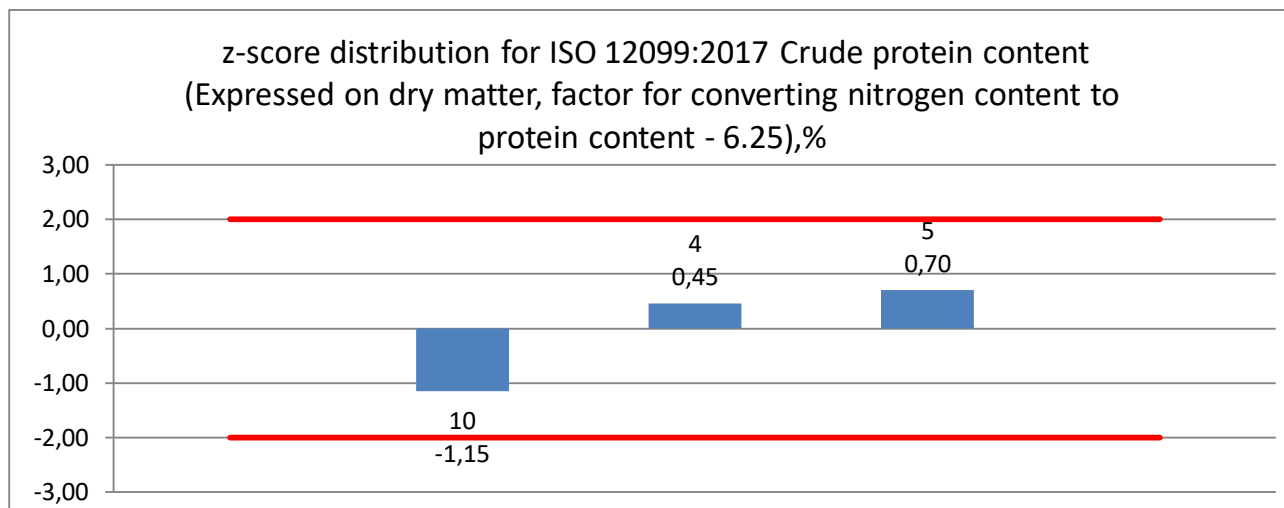
8.9. ISO 20483:2013/ДСТУ ISO 20483:2016 Crude protein content (Expressed on dry matter, factor for converting nitrogen content to protein content - 6.25), %



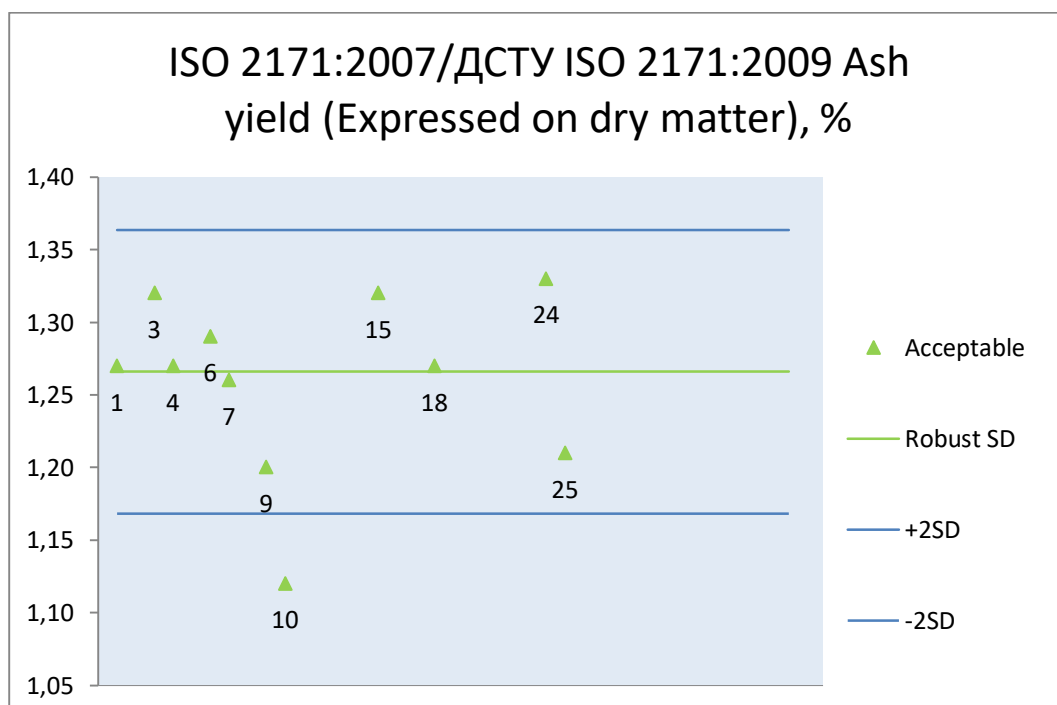
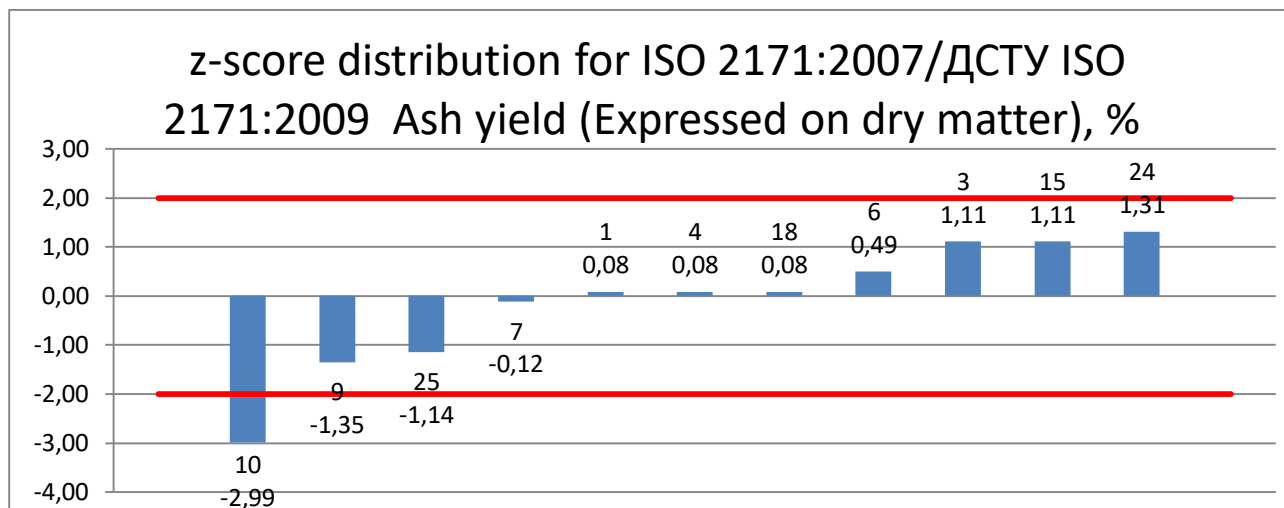
8.10. ISO 16634-2:2016 Crude protein content (Expressed on dry matter, factor for converting nitrogen content to protein content - 6.25), %



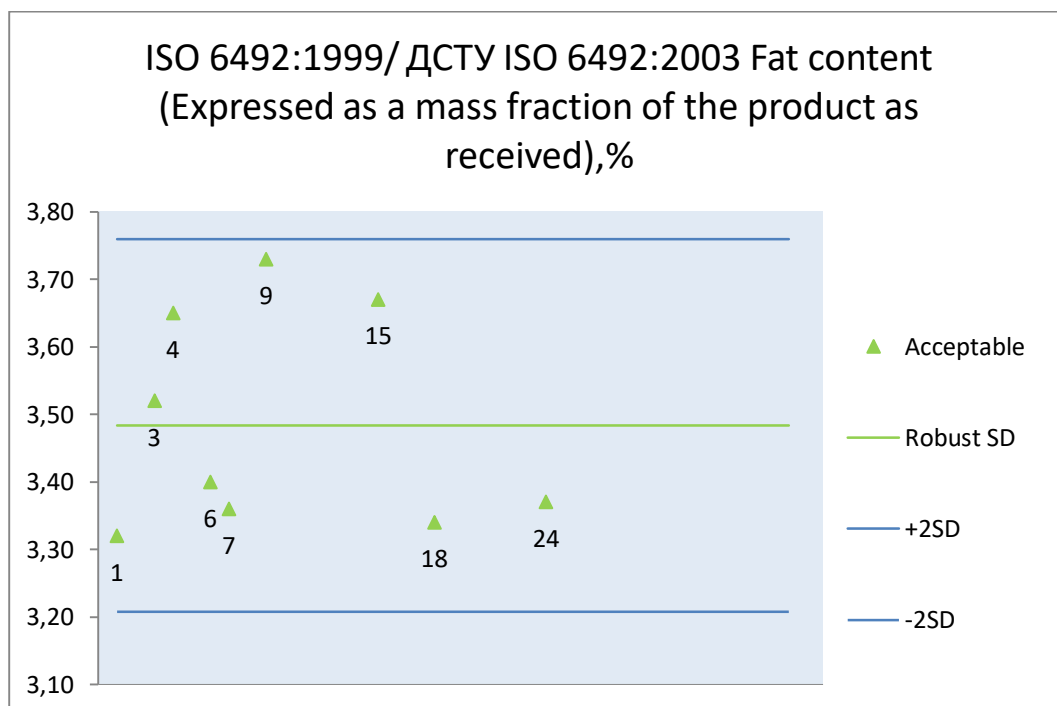
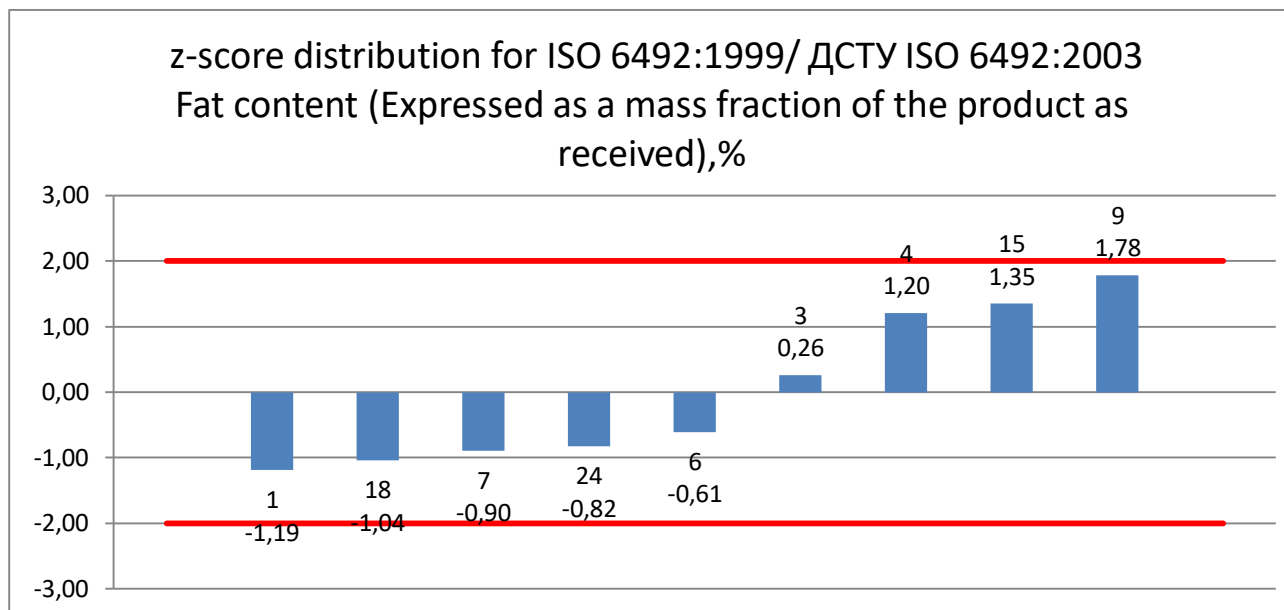
8.11. ISO 12099:2017 Crude protein content (Expressed on dry matter, factor for converting nitrogen content to protein content - 6.25), %



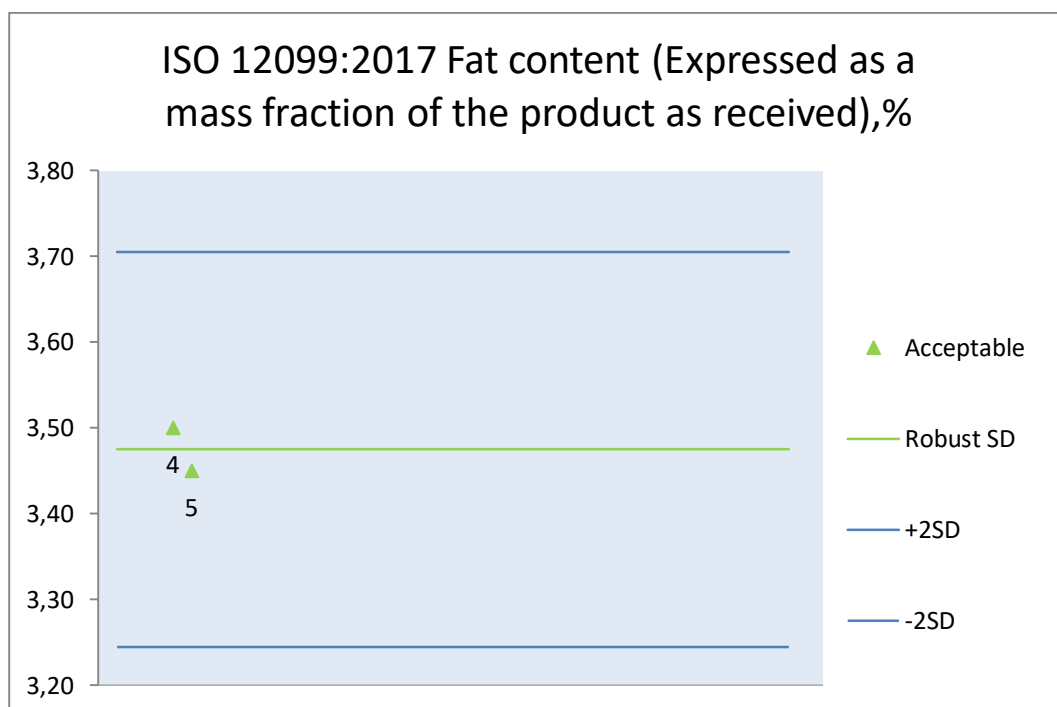
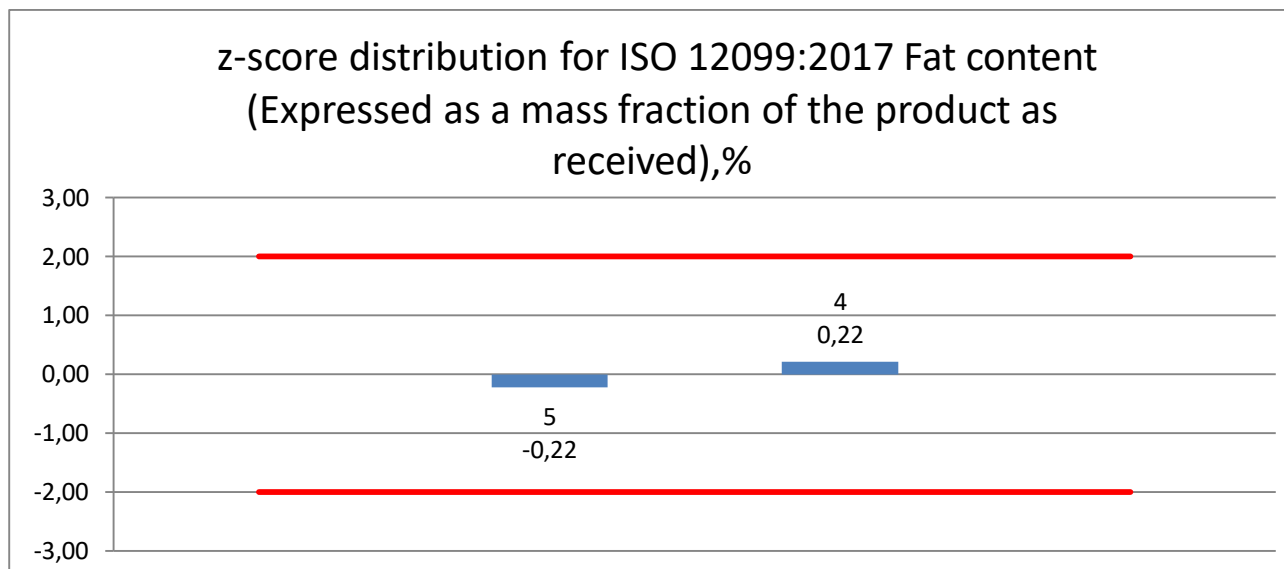
8.12. ISO 2171:2007/ДСТУ ISO 2171:2009 Ash yield (Expressed on dry matter), %



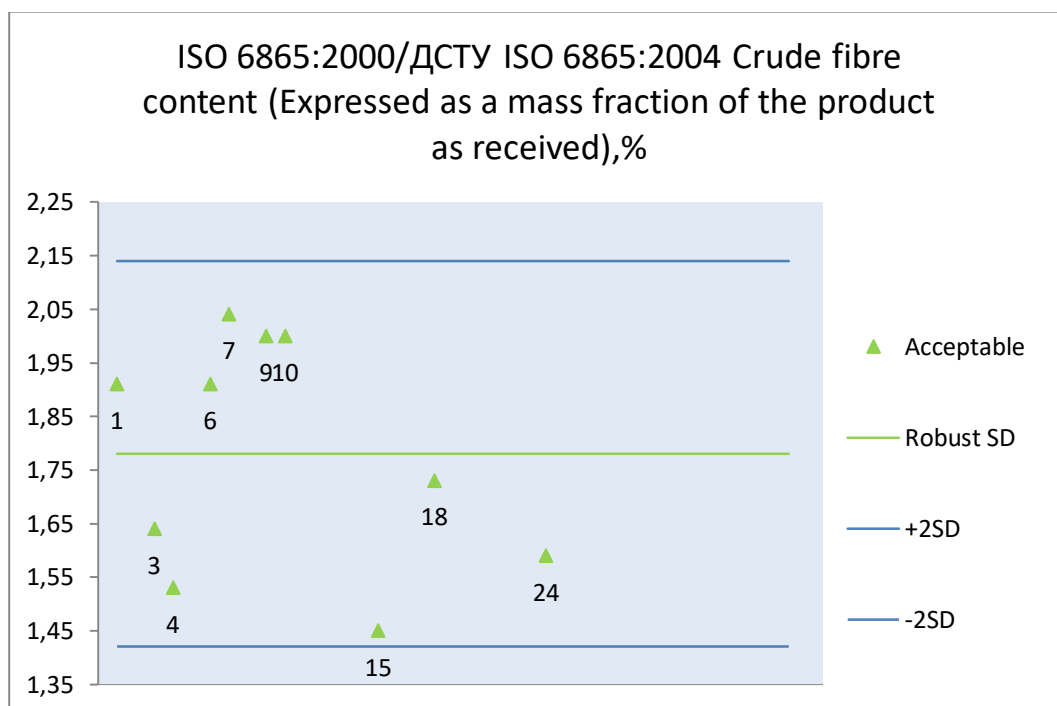
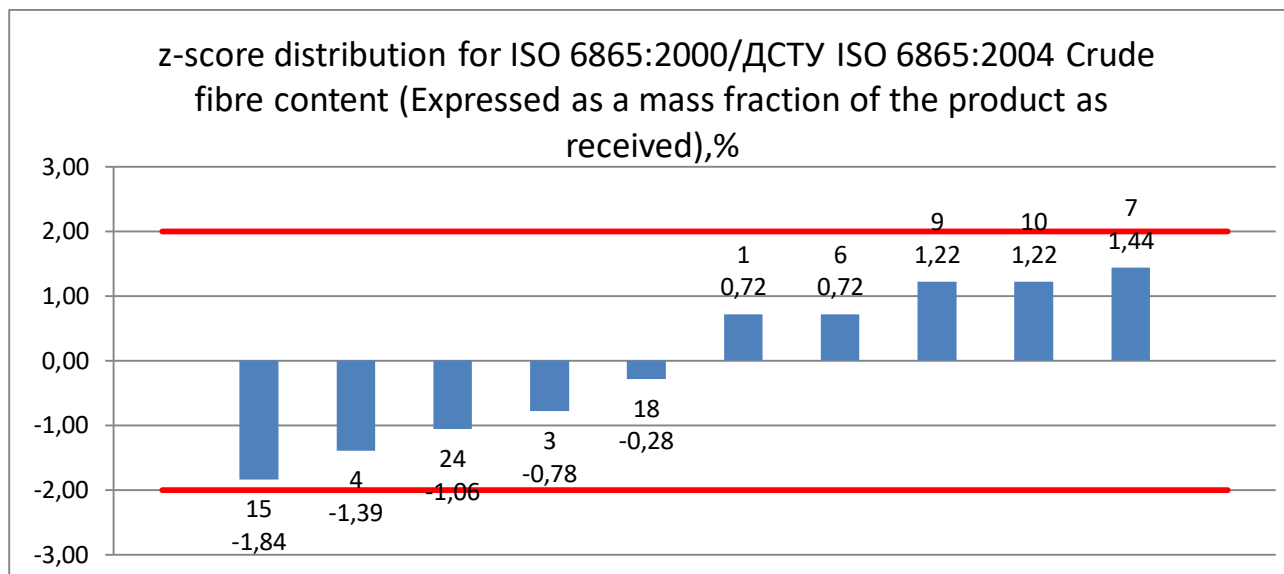
8.13. ISO 6492:1999/ ДСТУ ISO 6492:2003 Fat content (Expressed as a mass fraction of the product as received), %



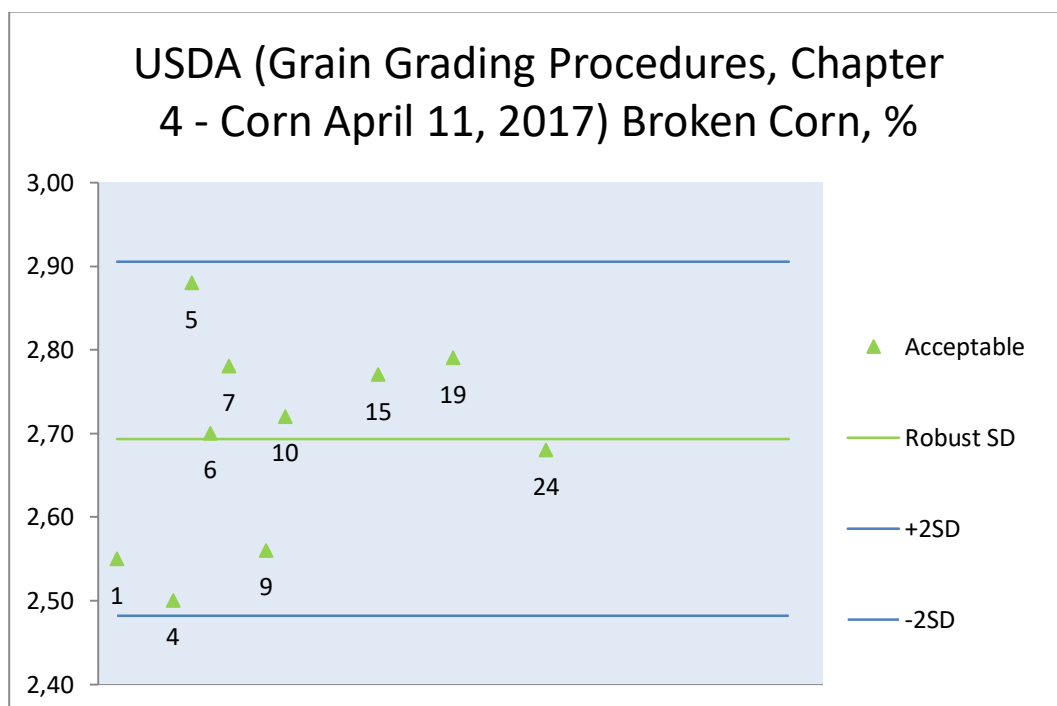
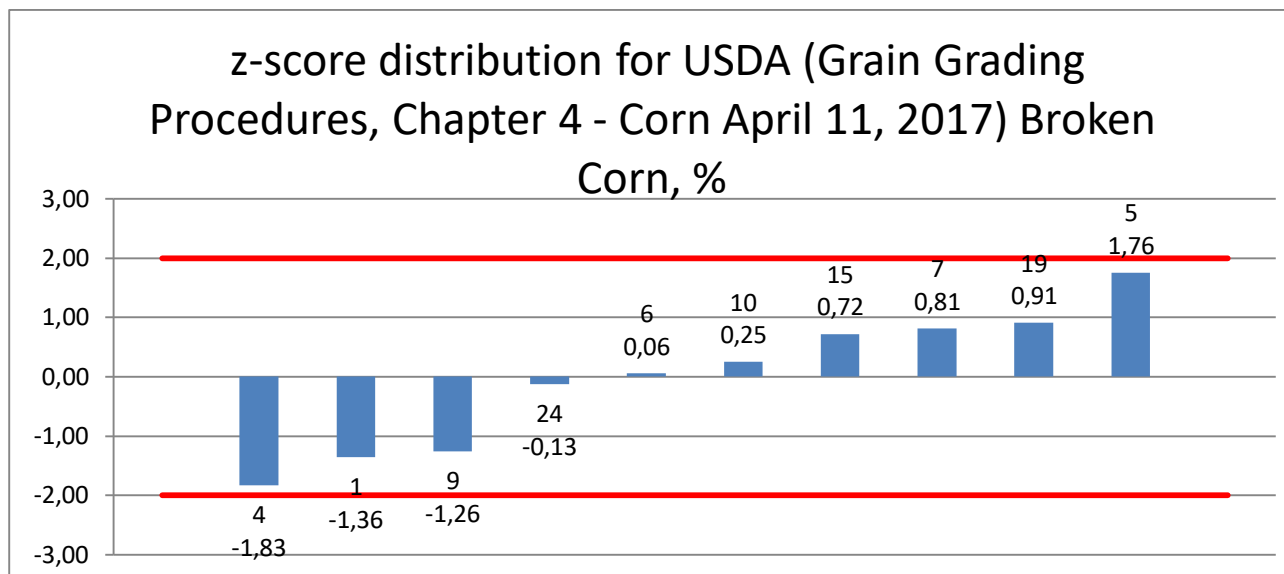
8.14. ISO 12099:2017 Fat content (Expressed as a mass fraction of the product as received), %



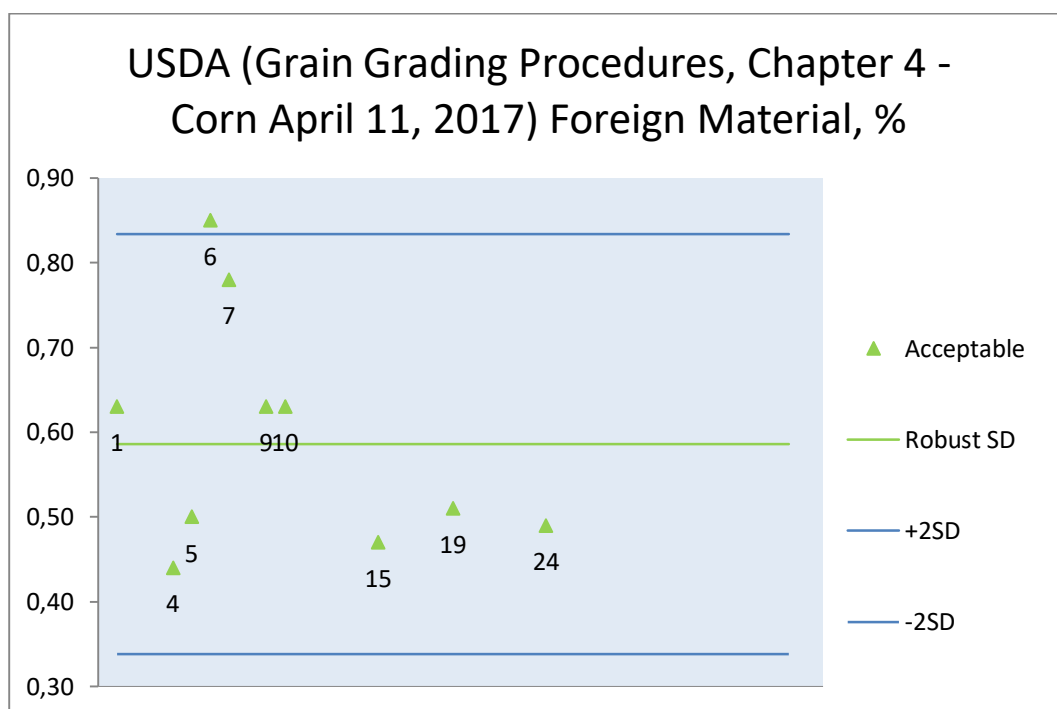
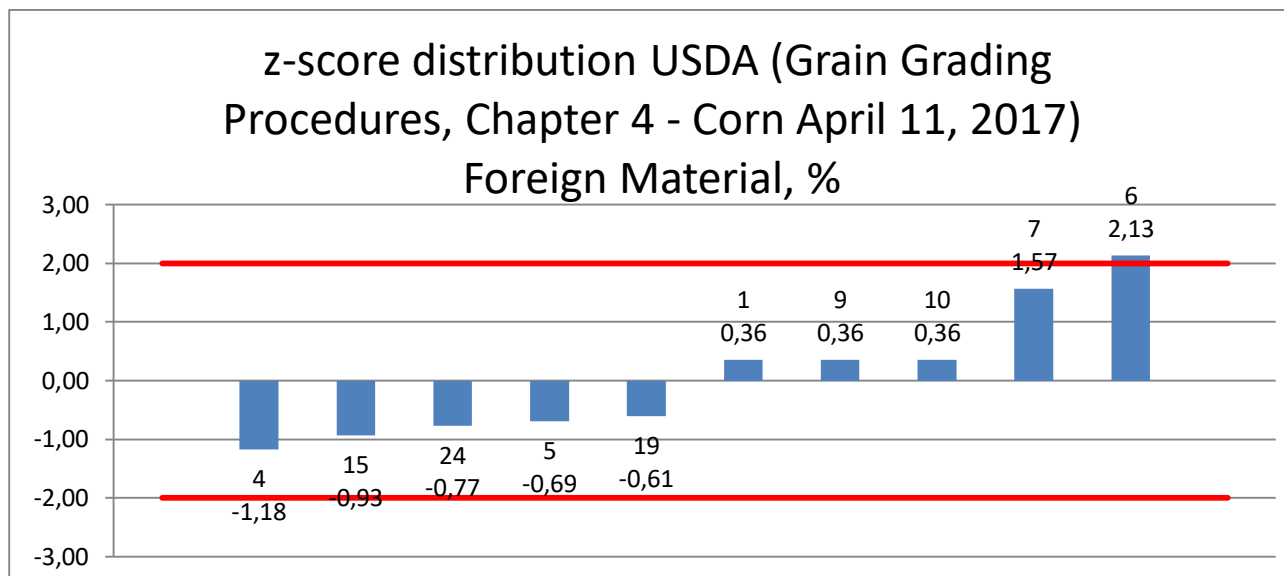
8.15. ISO 6865:2000/ДСТУ ISO 6865:2004 Crude fibre content (Expressed as a mass fraction of the product as received), %



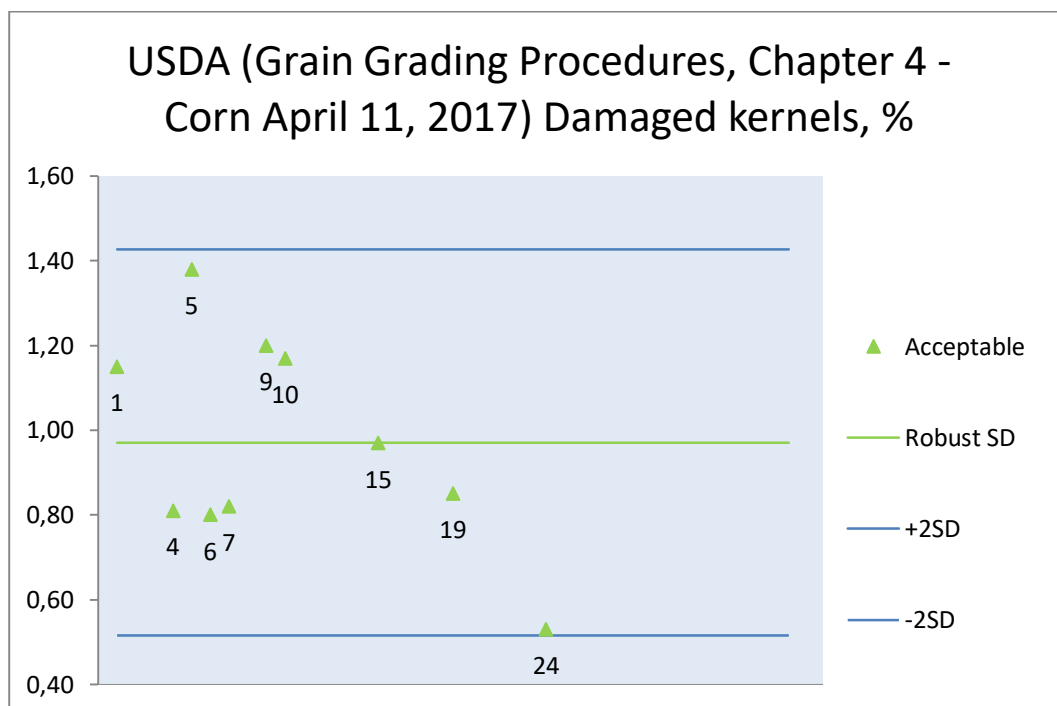
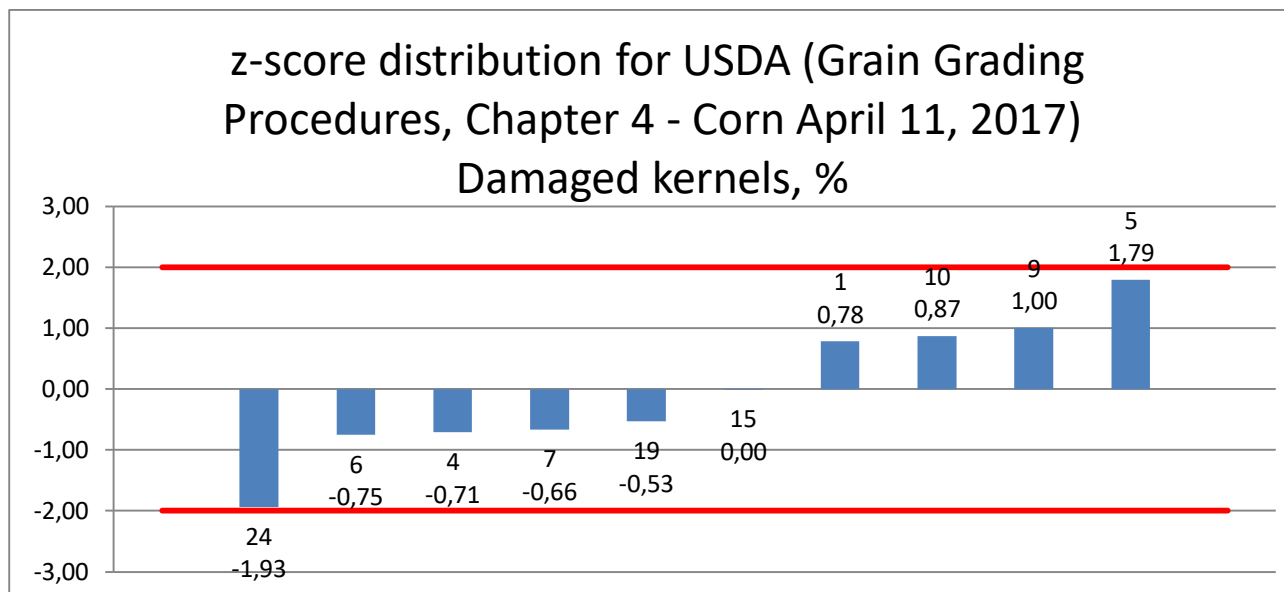
8.16. USDA (Grain Grading Procedures, Chapter 4 - Corn April 11, 2017) Broken Corn, %



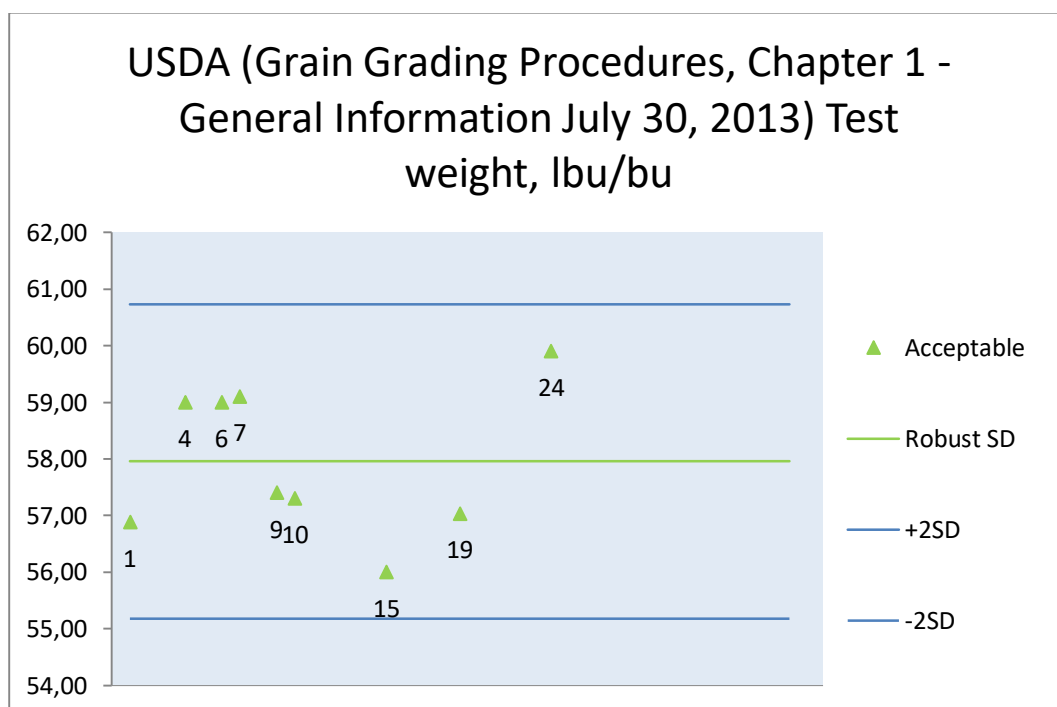
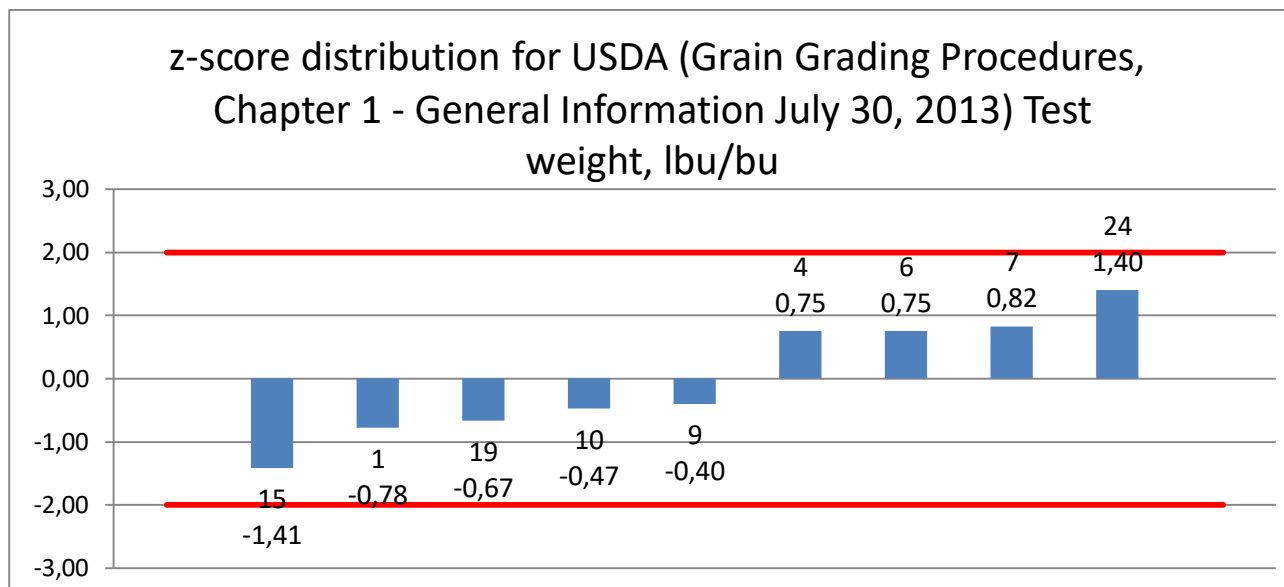
8.17. USDA (Grain Grading Procedures, Chapter 4 - Corn April 11, 2017) Foreign Material, %



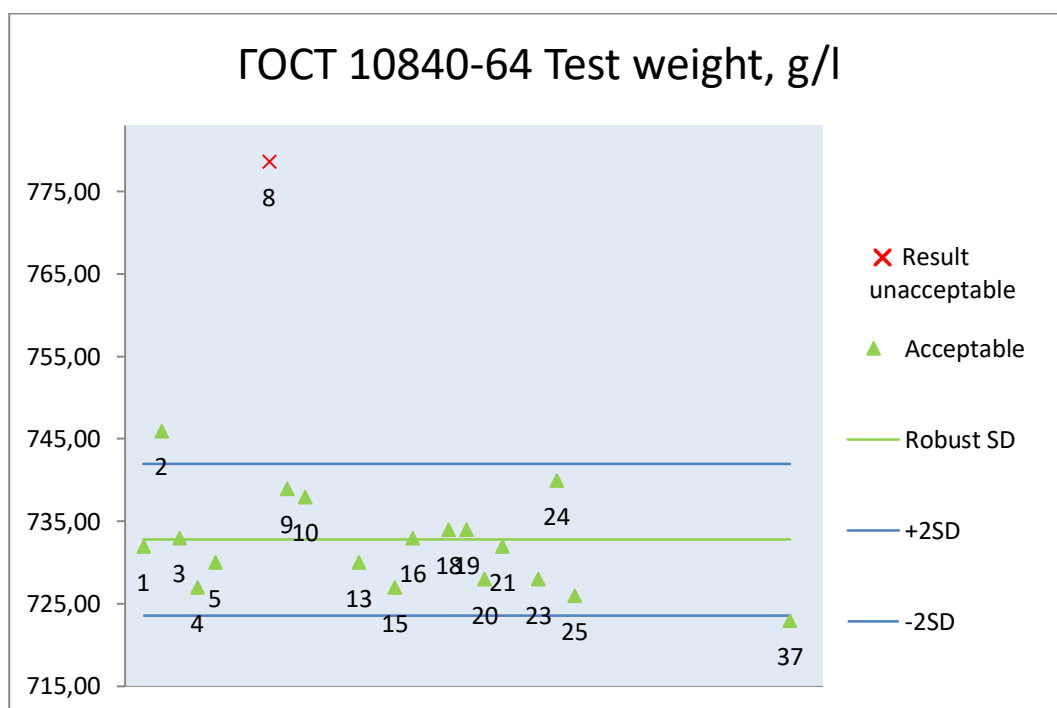
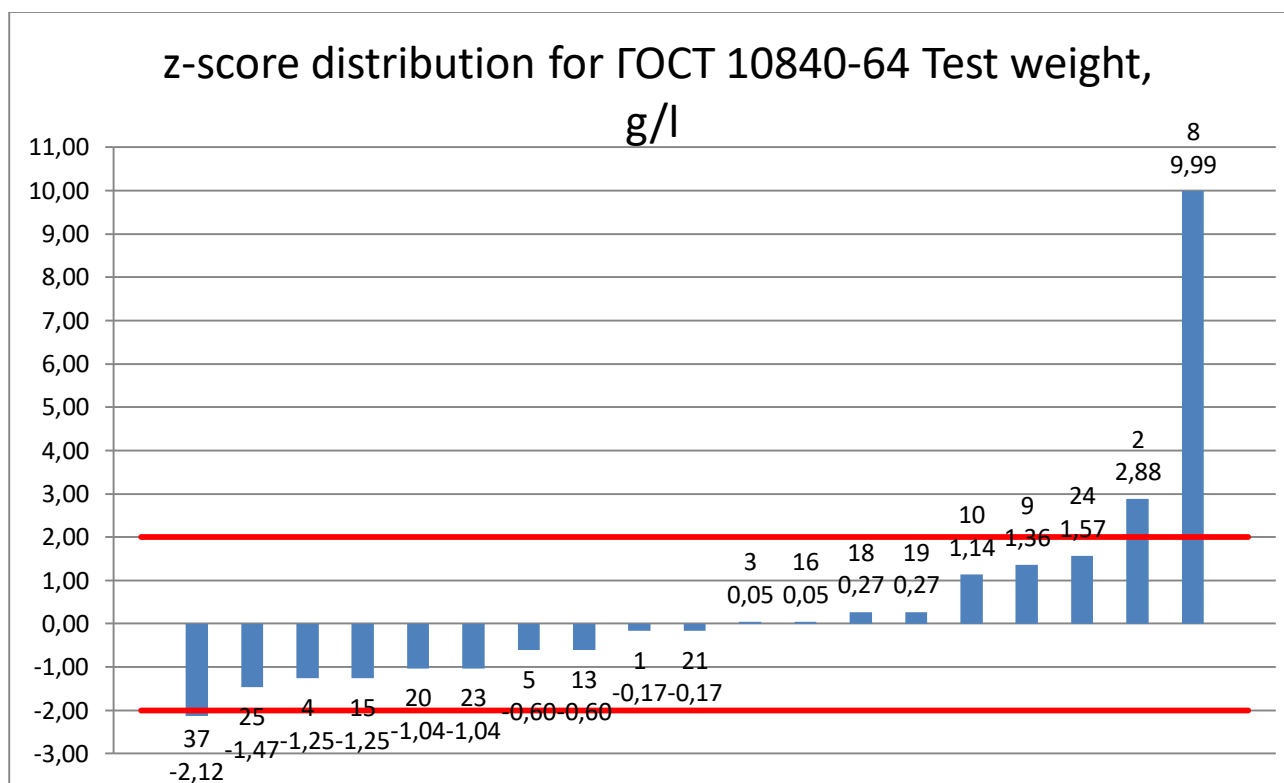
8.18. USDA (Grain Grading Procedures, Chapter 4 - Corn April 11, 2017)
Damaged kernels, %



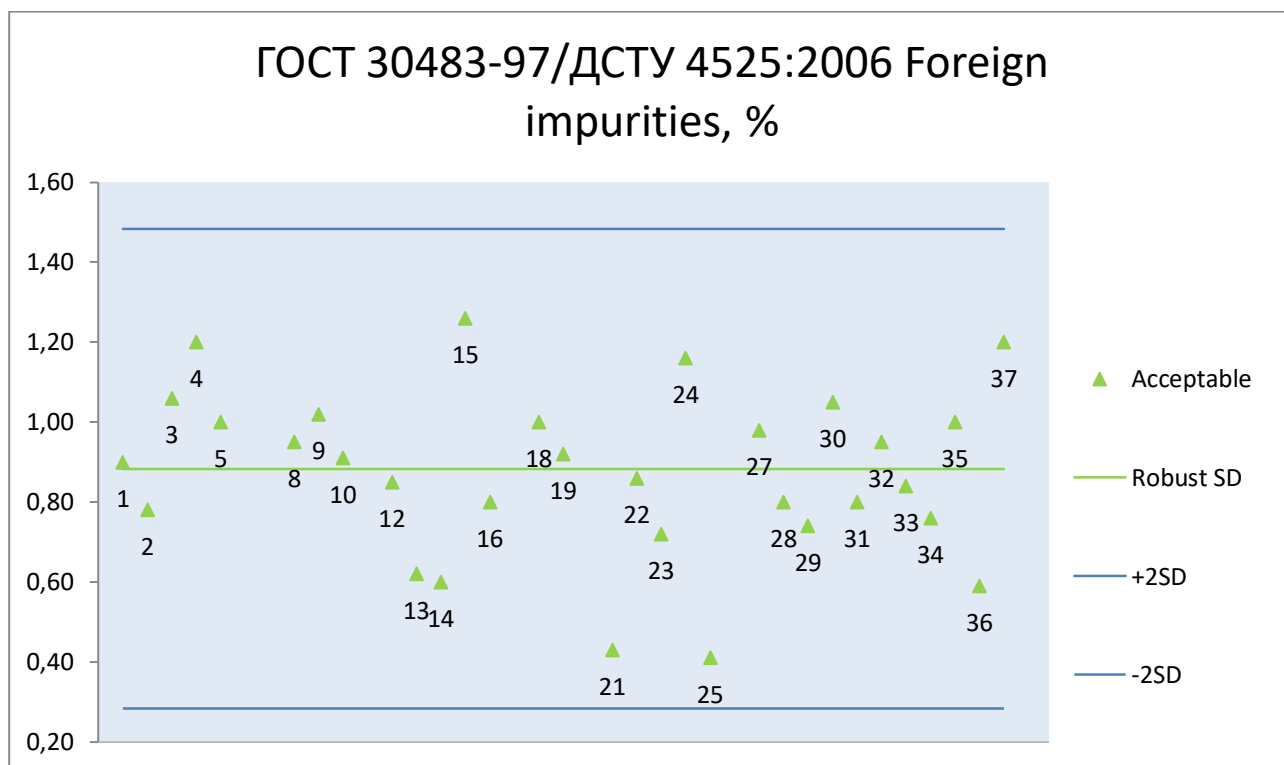
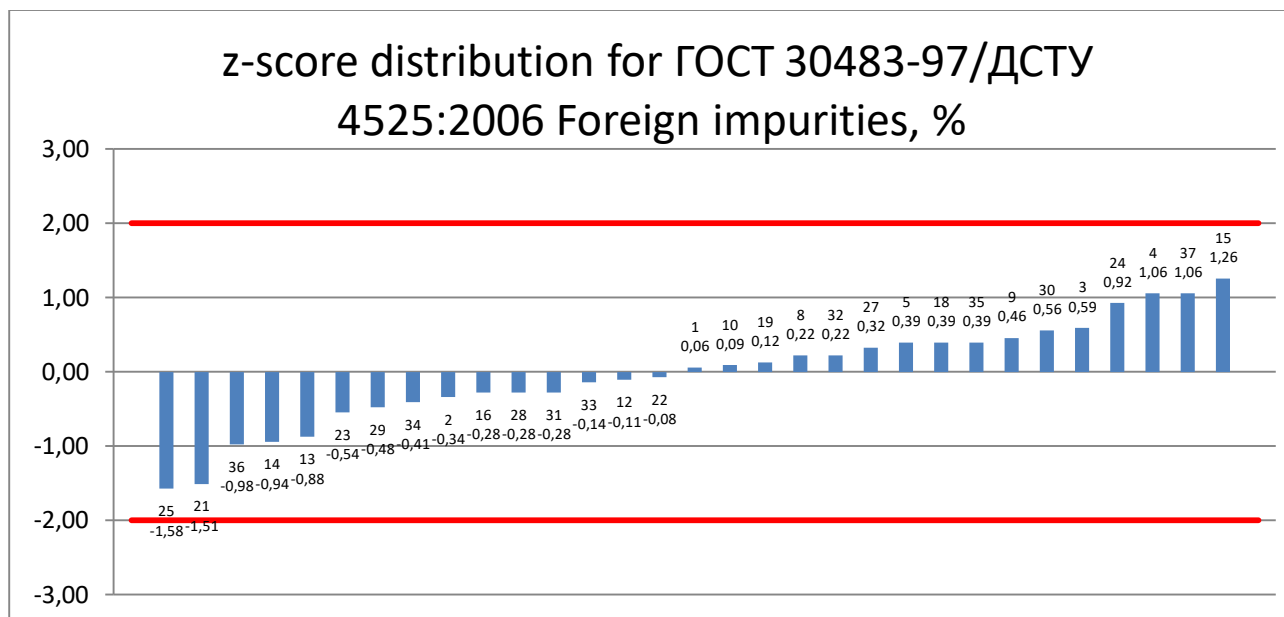
8.19. USDA (Grain Grading Procedures, Chapter 1 - General Information July 30, 2013) Test weight, lbu/bu



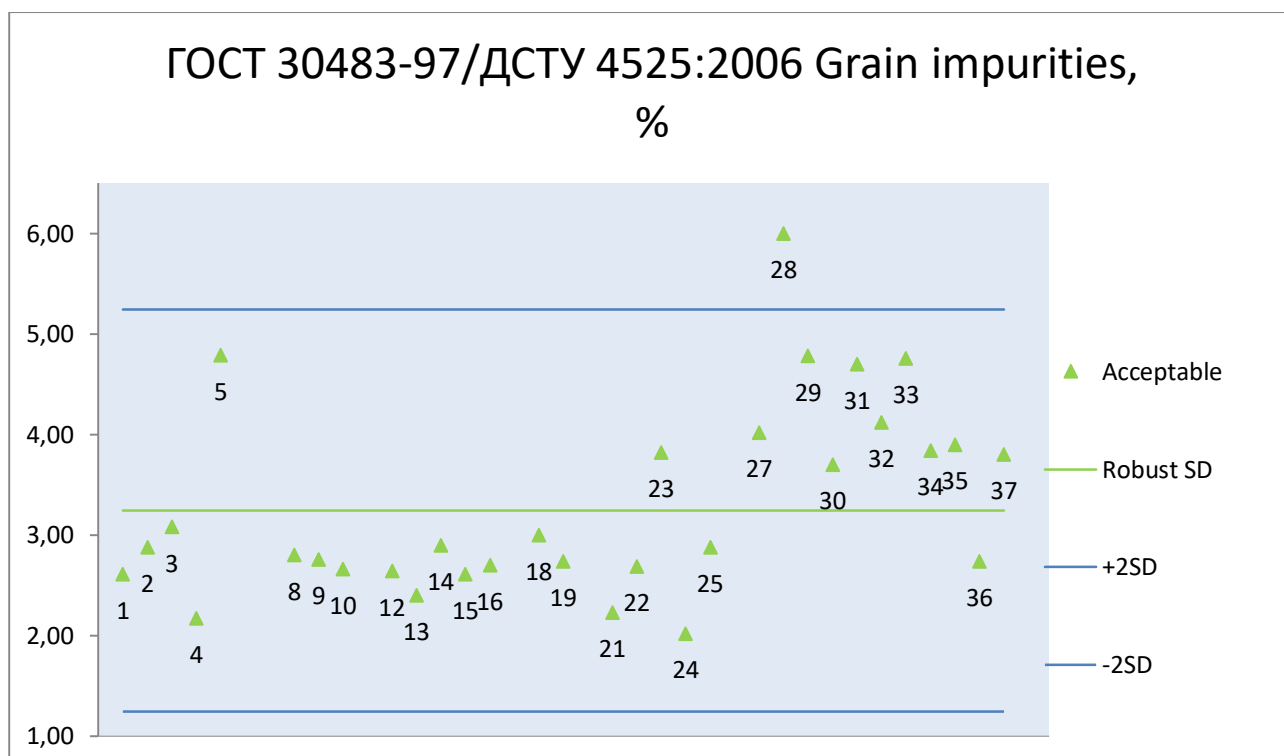
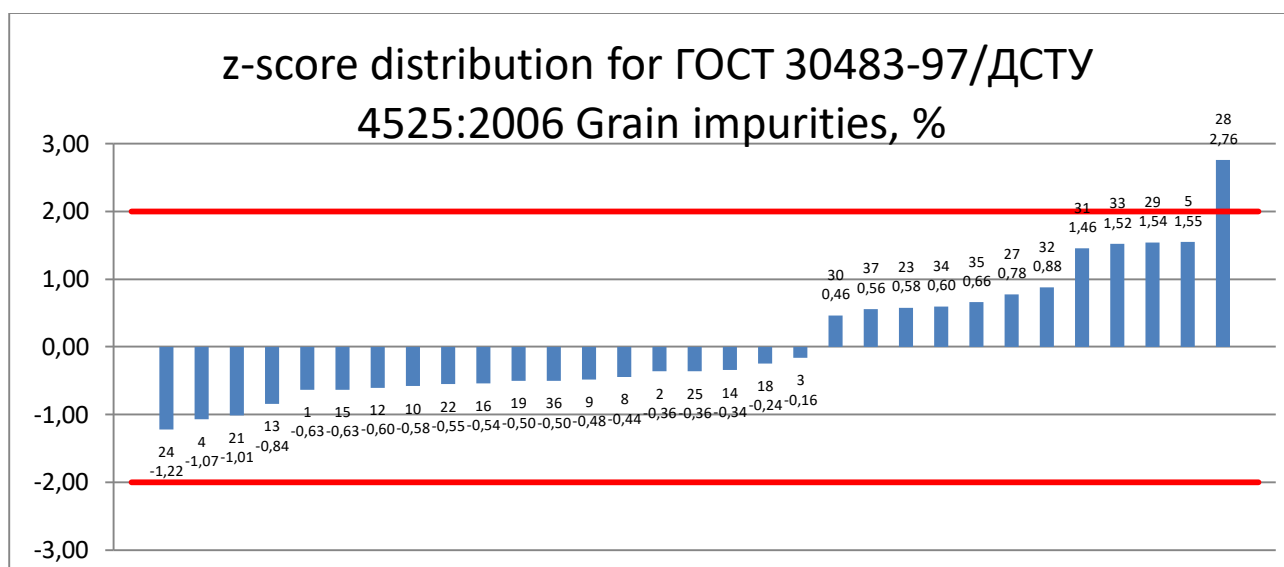
8.20. ГOCT 10840-64 Test weight, g/l



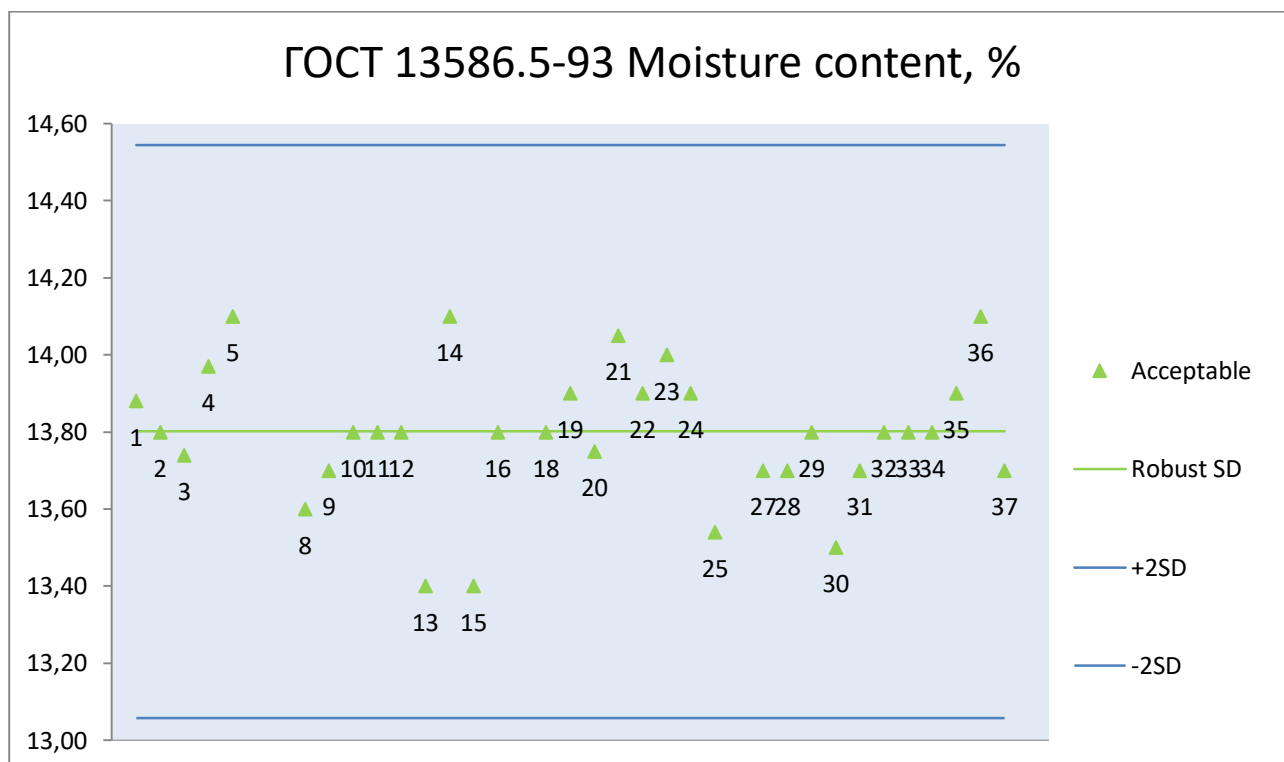
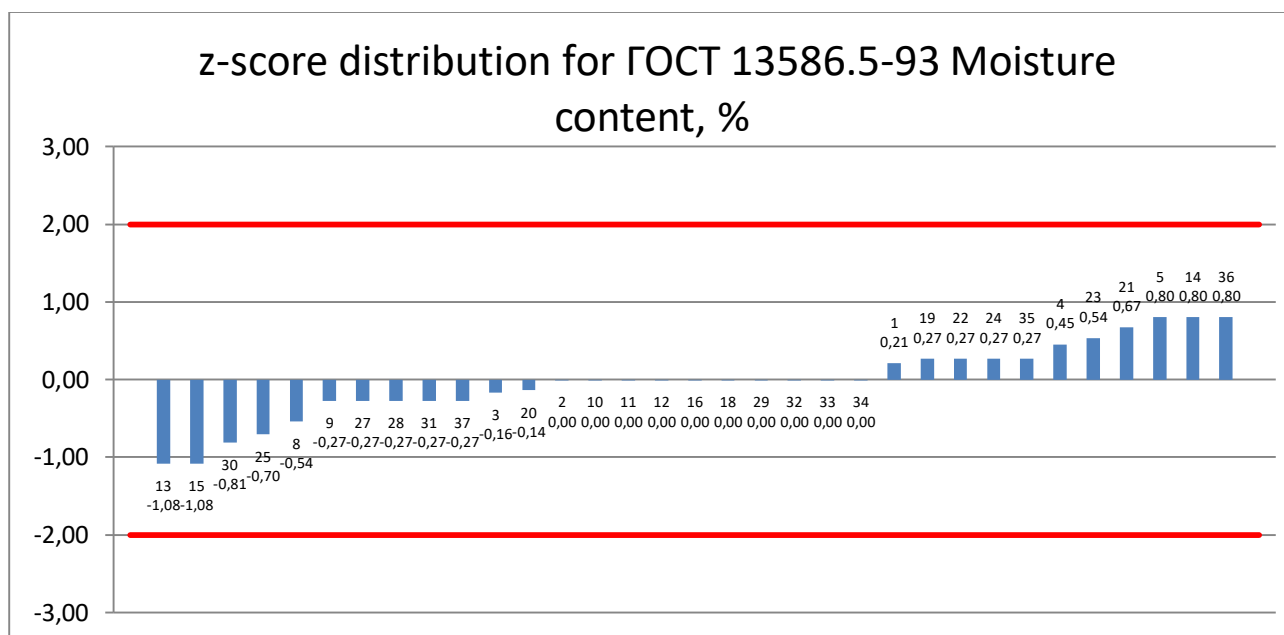
8.21. ГОСТ 30483-97/ДСТУ 4525:2006 Foreign impurities, %



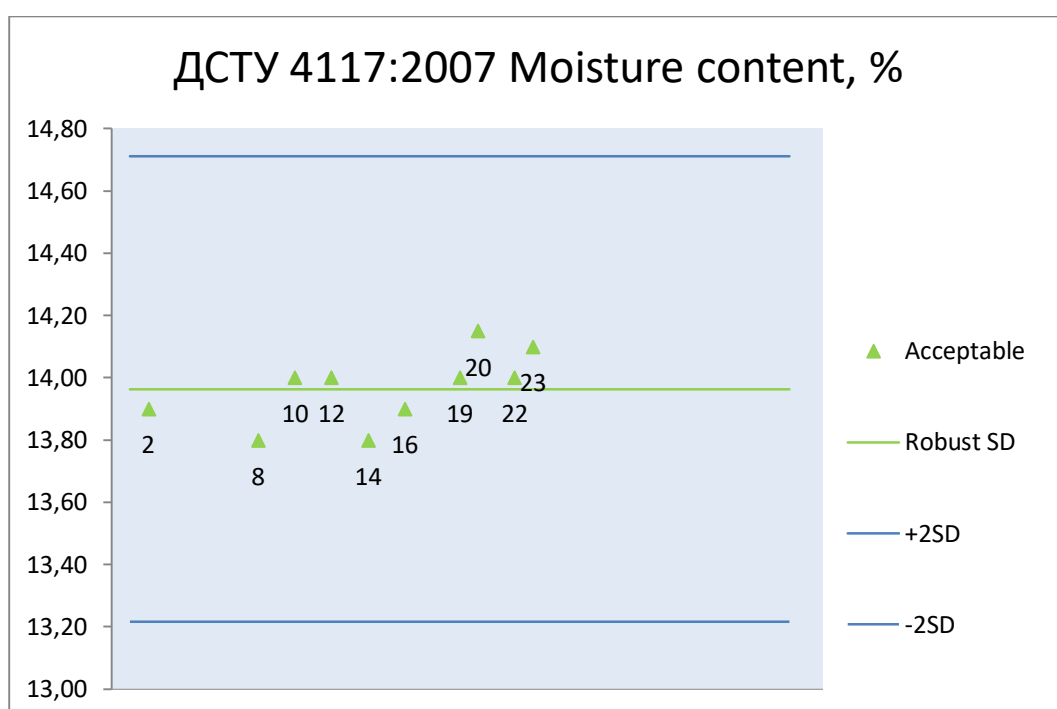
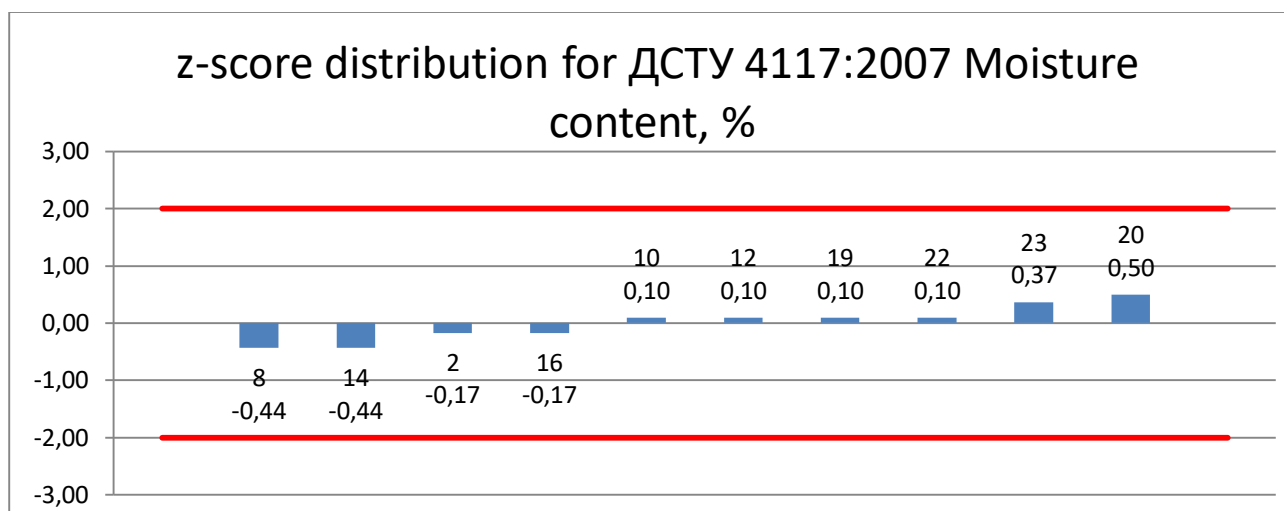
8.22. ГОСТ 30483-97/ДСТУ 4525:2006 Grain impurities, %



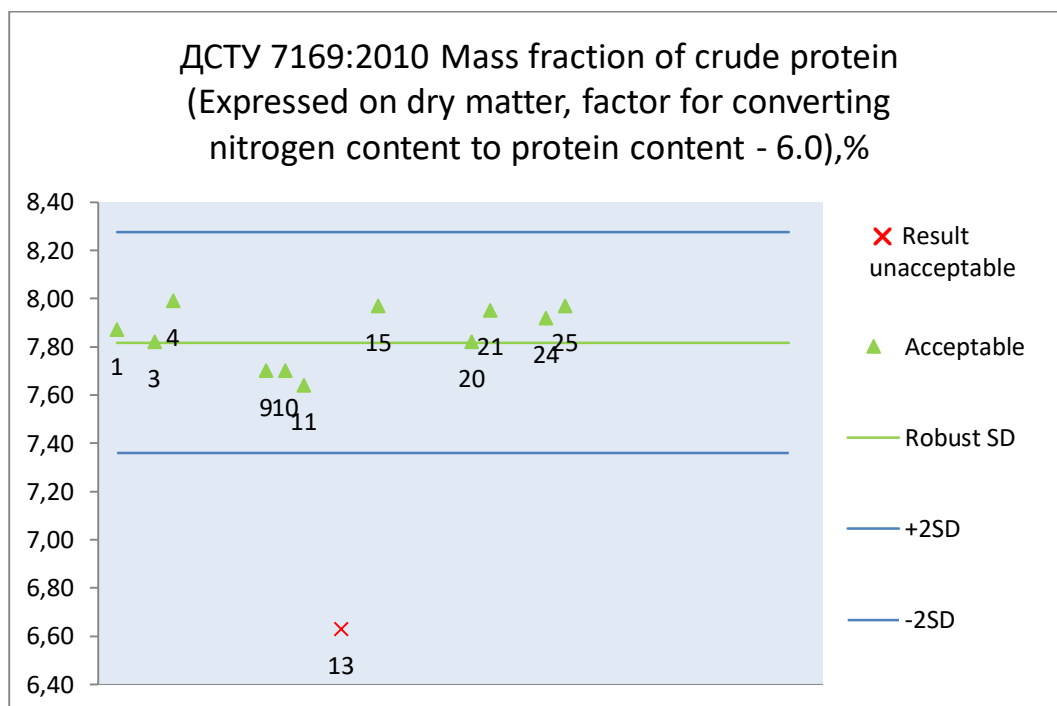
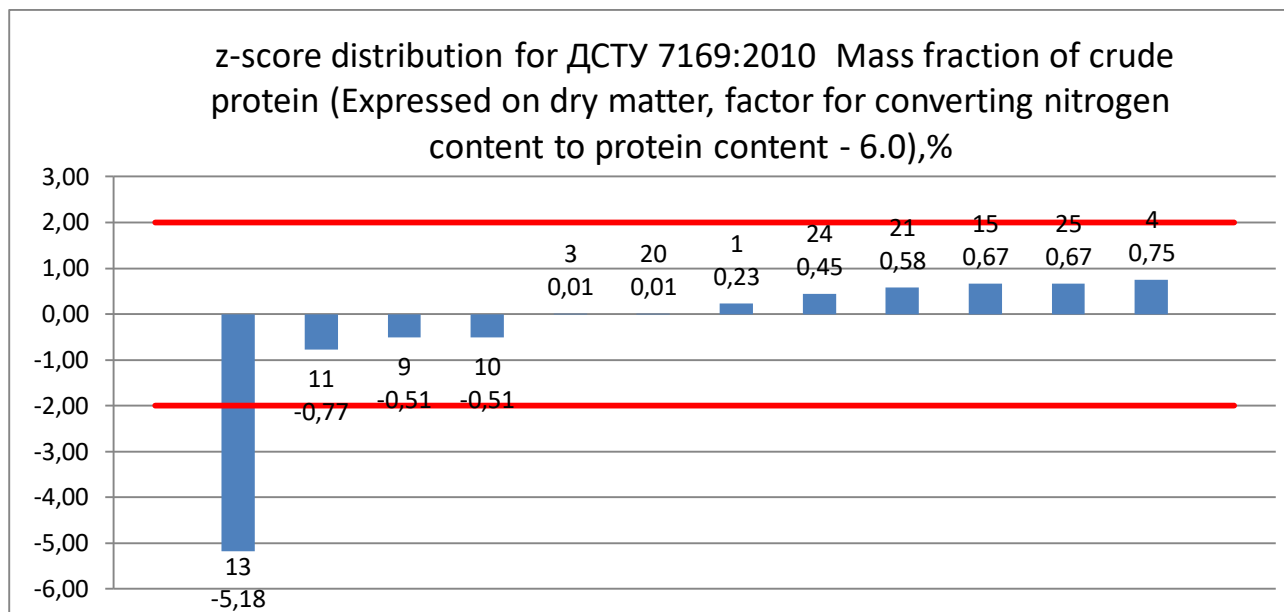
8.23. ГOCT 13586.5-93 Moisture content, %



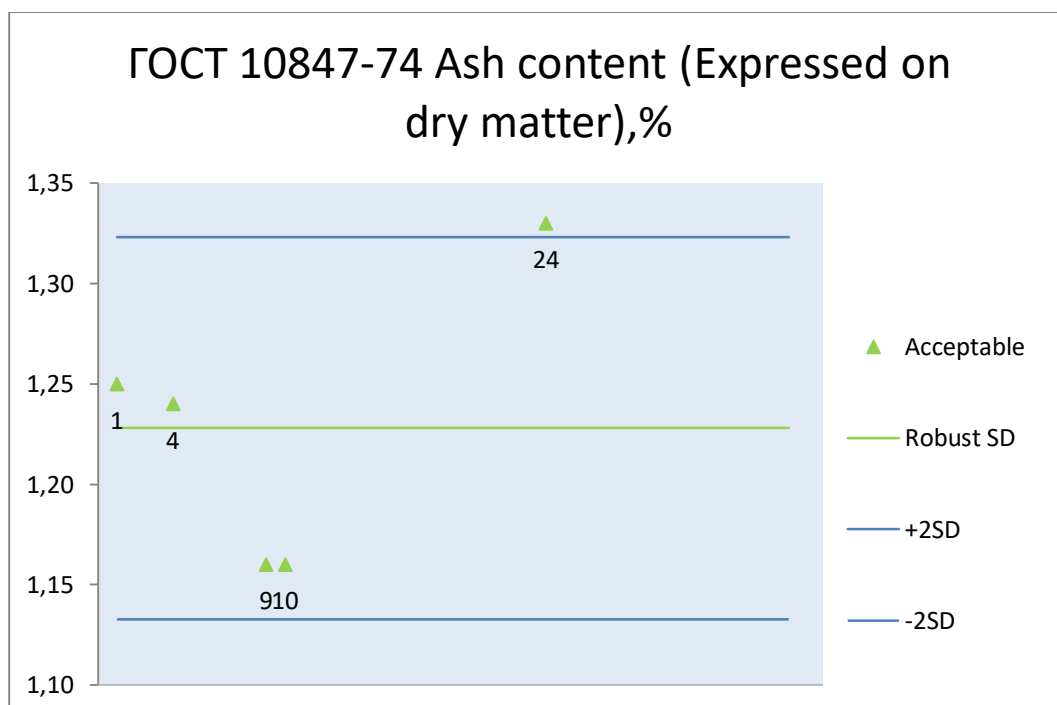
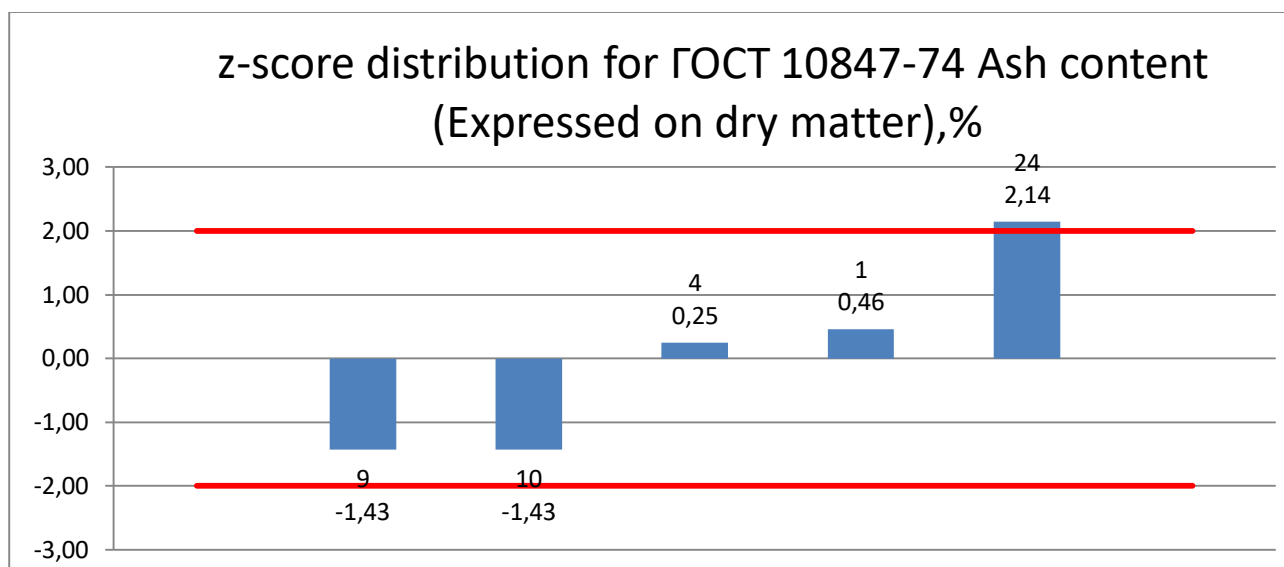
8.24. ДСТУ 4117:2007 Moisture content, %



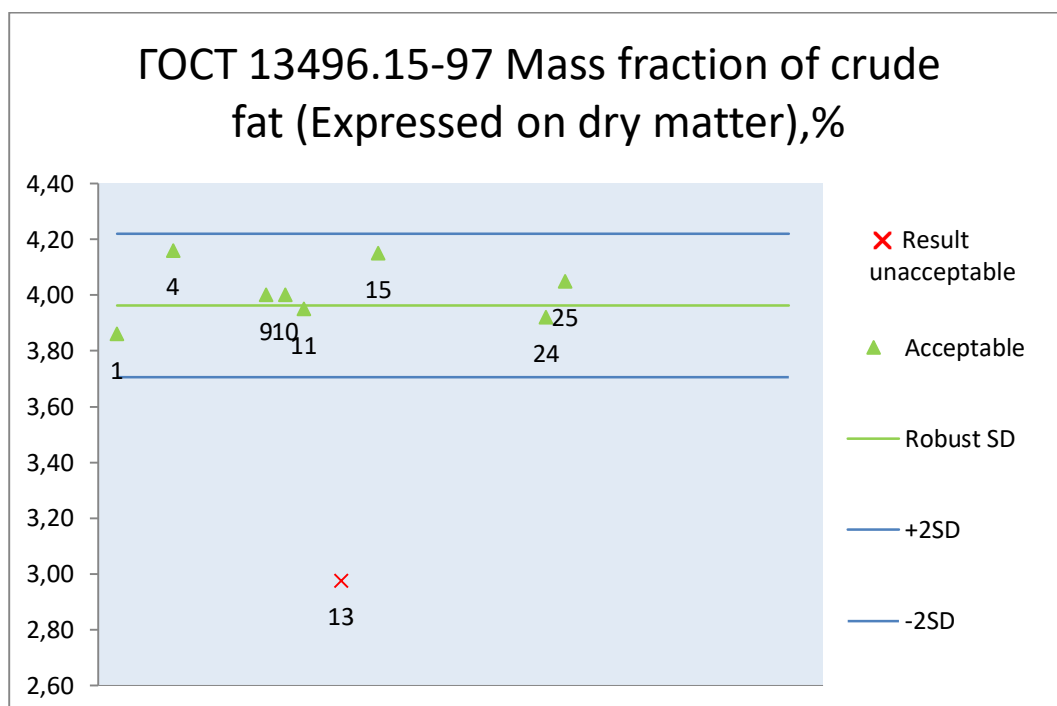
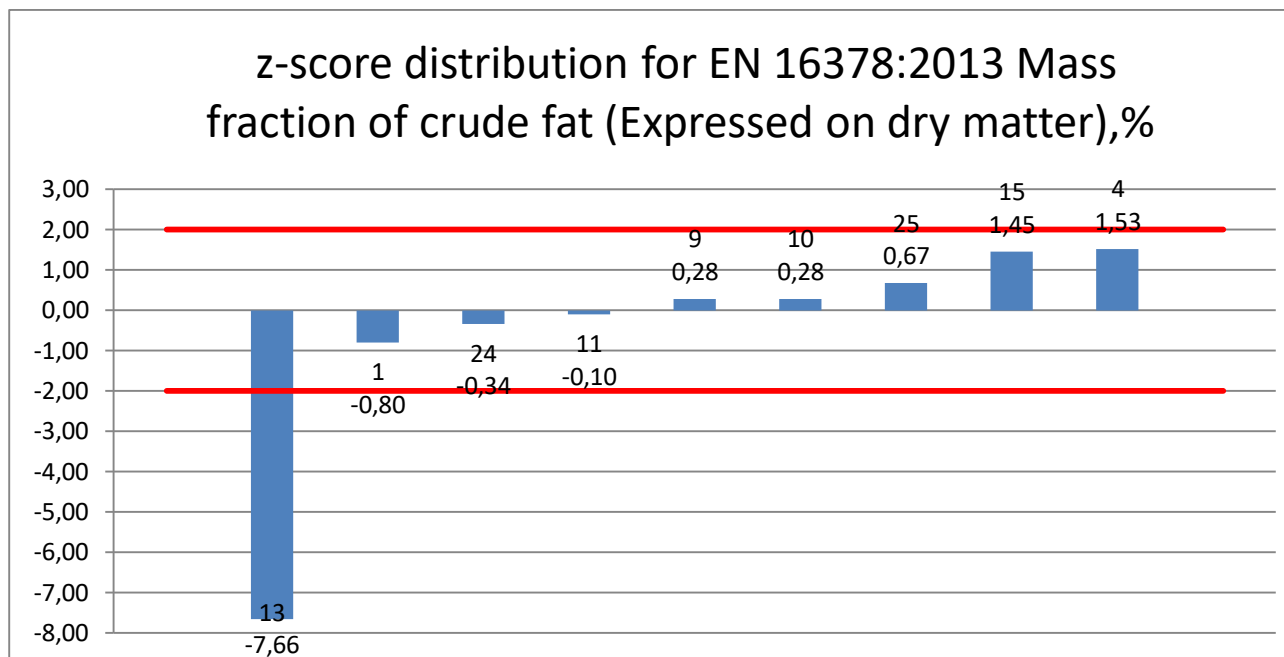
8.25. ДСТУ 7169:2010 Mass fraction of crude protein (Expressed on dry matter, factor for converting nitrogen content to protein content - 6.0), %



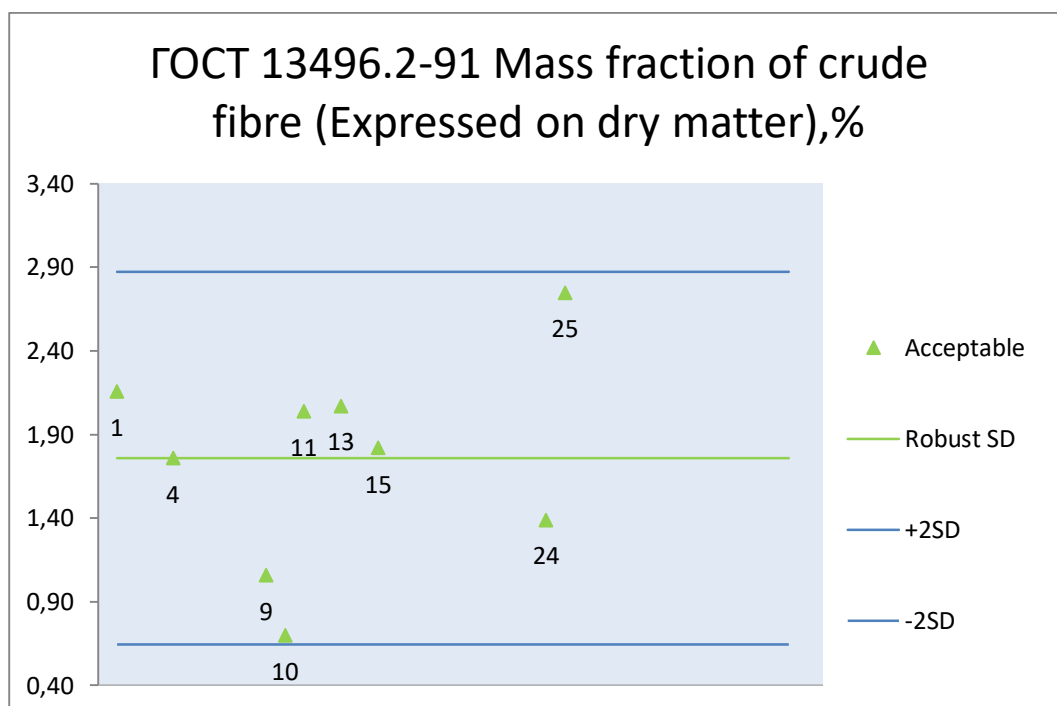
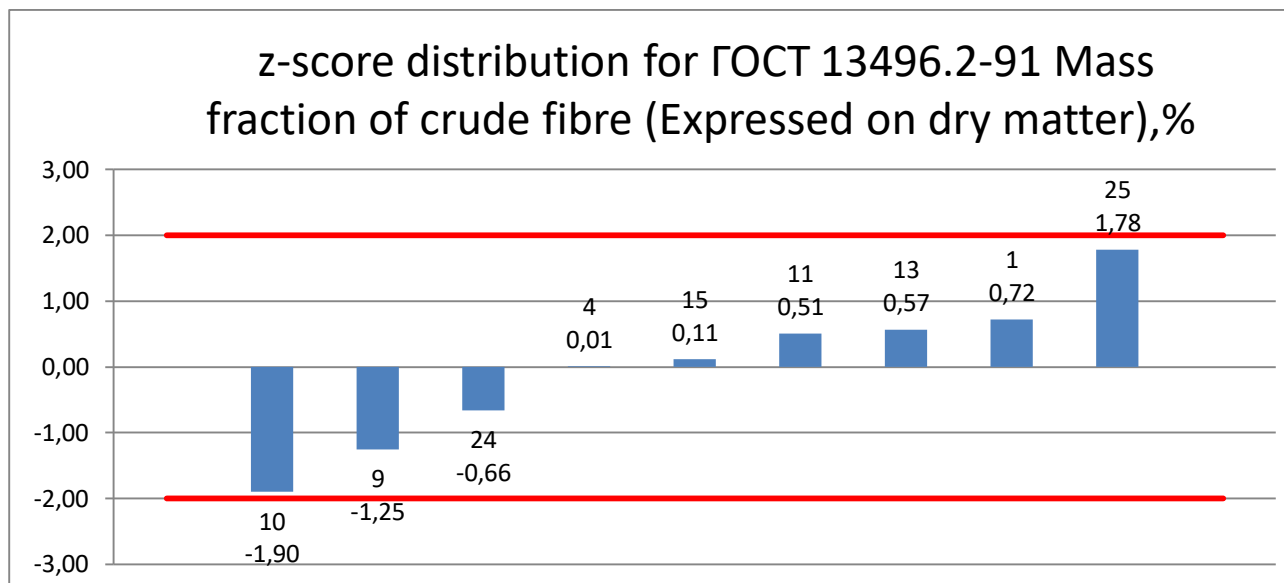
8.26. ГOCT 10847-74 Ash content (Expressed on dry matter), %



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



8.28. ГOCT 13496.2-91 Mass fraction of crude fibre (Expressed on dry matter), %



9. NORMATIVE REFERENCE

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3. FOOD ANALYSIS PERFORMANCE ASSESSMENT SCHEME (FAPAS). Protocol for the organization and analysis of data, sixth edition, 2002.
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7. ILAC Discussion Paper on Homogeneity and Stability Testing, April 2008.
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