



**PROFICIENCY TESTING PT.UA.1.3.2016
ANIMAL FEEDING STUFFS (QUALITY)
PROFICIENCY TESTING REPORT
ROUND 16 AUGUST 2026**

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2. SUMMARY

2.1. The purpose of proficiency testing in animal feeding stuffs 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. Current PT scheme is registered in the EPTIS database.

2.3. This is the final report on the PT.UA.1.3.2016 Round 16 held in July-August 2026. This report is issued according to ISO/IEC 17043[1] and PT.UA.1.3.2016 Round 16 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 23 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.

2.7. If the Participant does not agree with the proficiency testing results or has any comments on the Provider's work, one can submit a complaint or appeal within 10 days. More information on the complaint procedure can be found at <https://www.metrologyservice.com.ua/> or by contacting the Provider.

2.8. The Provider declares that all results presented in this report are confidential. Each participant is identified by a unique number assigned to them based on their registration application for each round of the program separately. This number is confidential information and may only be disclosed at the participant's request.

2.9. Where applicable, the metrological traceability of assigned values is ensured, as confirmed by the use of measurement equipment properly calibrated in accordance with current EA and NAAU policies.

2.10. The uncertainty of the assigned values (for quantitative evaluation) may be provided upon the participant's request.

2.11. All users of this report are prohibited from copying or reproducing it, in whole or in part, without the written consent of the Provider.

2.12. Provider is accredited by NAAU in accordance with the requirements of ISO/IEC 17043. The list of parameters is specified in the scope of accreditation, which can be found on the website <https://www.metrologyservice.com.ua/> or obtained upon request from the Provider.

3. GENERAL PROTOCOL FOR PROFICIENCY 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 IIII 7.3.1 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.1.3.2016 Round 16. 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.

3.2.3. During sample preparation, all necessary procedures (where applicable) were performed, such as the removal of impurities. Sample preparation report can be provided upon request.

3.3. DISPATCH AND RECEIPT OF SAMPLES

3.3.1. Samples of test material – **Soybean meal (Sample A)** and **Rapeseed meal (Sample B)** were dispatched 06.07.2026 according to schedule of proficiency testing programme PT.UA.1.3.2016 Round 16.

3.3.2. Each produced and identified sample was hermetically sealed.

3.3.3. A total of 23 participants from **four countries** received sample (Sample A and Sample B). Results were returned from 23 participants.

3.3.4. The samples were shipped to participants via the commercial delivery service «Nova Poshta» LL, the delivery to abroad was done by courier delivery.

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] 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 3.00% (12 results) of all results in this round were considered to be unsatisfactory. All results in previous Round 14 were considered to be satisfactory.

3.5.6. There was only one result reported for «Active acidity (pH), pH units (ДСТУ 7643:2014)». This result was not assessed by the Provider. Corresponding columns are not presented in the tables.

3.5.7. Participant №1 reported a qualitative result for «Urea content, % (ISO 6654:1991/ДСТУ ISO 6654:2005)» as «<0.01». This result was assessed by the Provider as «Satisfactory (S)».

3.5.8. Participant №5 reported a qualitative result for «Urea content, % (ISO 6654:1991/ДСТУ ISO 6654:2005)» as «<0.10». This result was assessed by the Provider as «Satisfactory (S)».

3.5.9. Participant №15 stated result for Sample A «Mass fraction of crude fibre,% (expressed as a mass fraction of the dry product)» according to the «ДСТУ 8844:2019 п.6.4.» method instead of the «ДСТУ 8844:2019 п.6.1.» proposed by the Provider. This result was assessed by the Provider and was taken into account when calculating robust mean and robust SD.

3.5.10. Participant №17 reported a qualitative result for «Urea content, % (ISO 6654:1991/ДСТУ ISO 6654:2005)» as «Не виявлено (<0.25)». This result was assessed by the Provider as «Satisfactory (S)».

3.5.11. Participant №19 reported a qualitative result for «Urea content, % (ISO 6654:1991/ДСТУ ISO 6654:2005)» as «absent». This result was assessed by the Provider as «Satisfactory (S)».

3.5.12. Participant №18 submitted the following additional results:

Sample A: «Moisture content, %» using the method «ДСТУ ISO 6496:2005» instead of the method proposed by the Provider, «ISO 771:2021/ДСТУ ISO 771:2006», as «10.54%»;

«Crude protein content, % (expressed as a mass fraction of the product as received)» using the method «ДСТУ 4924:2008» instead of the method proposed by the Provider, «ISO 5983-2:2009/ДСТУ EN ISO 5983-2:2022», as «45.98%»;

«Fat content, % (expressed as a mass fraction of the product as received)» using the method «МББ ГОСТ 13496.15-97» instead of the method proposed by the Provider, «ISO 734:2023/ДСТУ EN ISO 734:2022», as «1.04%»;

«Moisture content, %» using the method «МББ ГОСТ 27548-97» instead of the method proposed by the Provider, «ДСТУ 7621:2014», as «10.59%»;

«Mass fraction of crude fat, % (expressed as a mass fraction of the dry product)» using the method «МББ ГОСТ 13496.15-97» instead of the method proposed by the Provider, «ДСТУ 7458:2013», as «1.16%».

Sample B: «Moisture content, %» using the method «ДСТУ ISO 6496:2005» instead of the method proposed by the Provider, «ISO 771:2021/ДСТУ ISO 771:2006», as «10.13%»;

«Crude protein content, % (expressed as a mass fraction of the product as received)» using the method «ДСТУ 4924:2008» instead of the method proposed by the Provider, «ISO 5983-2:2009/ДСТУ EN ISO 5983-2:2022», as «34.98%»;

«Fat content, % (expressed as a mass fraction of the product as received)» using the method «МББ ГОСТ 13496.15-97» instead of the method proposed by the Provider, «ISO 734:2023/ДСТУ EN ISO 734:2022», as «2.08%»;

«Moisture content, %» using the method «МББ ГОСТ 27548-97» instead of the method proposed by the Provider, «ДСТУ 7621:2014», as «10.15%»;

«Mass fraction of crude fat, % (expressed as a mass fraction of the dry product)» using the method «МББ ГОСТ 13496.15-97» instead of the method proposed by the Provider, «ДСТУ 7458:2013», as «2.31%»;

«Total glucosinolates content, $\mu\text{mol/g}$ of dry matter of the product» using the method «ДСТУ 4969-1:2008» instead of the method proposed by the Provider, «ISO 9167:2019/ДСТУ EN ISO 9167:2022/ДСТУ ISO 9167-1:2007», as «21,92 мкмоль/г ».

These results were assessed by the Provider as № 25 and were not taken into account when calculating robust mean and robust SD.

3.5.13. Participant №23 reported results for Sample A and Sample B for «Ash insoluble in hydrochloric acid, % (expressed as a mass fraction of the product as received) (ISO 5985:2002/Amd 1:2015/ДСТУ ISO 5985:2004)» and «Mass fraction of ash insoluble in hydrochloric acid, % (expressed as a mass fraction of the dry product) (ДСТУ 9174:2022)» as «<0.01». Due to the robust mean and target PT standard deviation, which was selected from the results of interlaboratory comparisons, these results were assessed by the Provider as «Unsatisfactory (NS)».

4. HOMOGENITY AND STABILITY ASSESMENT

4.1. Samples were assessed for homogeneity and stability after blending and packing by selecting five samples (Sample A and Sample B) of material at random from all those produced. Three of these samples (Sample A and Sample B) were tested in duplicate under repeatability conditions as only 36 samples (Sample A and Sample B) were produced according to [6]. Two other samples (Sample A and Sample B) 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. Homogeneity and stability were deemed satisfactory only if 100% of results are identical with intended results, i.e. with «Satisfactory (S)» result.

4.2.1. Homogeneity and stability for Sample A ISO 6654:1991/ ДСТУ ISO 6654:2005 «Urea content,%

Sample N	Method: ISO 6654:1991/ДСТУ ISO 6654:2005	Satisfactory/ Not satisfactory
	Urea content, %	
1	<0,01*	«Satisfactory (S)»
2	<0,01*	«Satisfactory (S)»
3	<0,01*	«Satisfactory (S)»
4	<0,01*	«Satisfactory (S)»
5	<0,01*	«Satisfactory (S)»

* limit of Quantification

Homogeneity and stability confirmed by 100% of satisfactory results.

4.3. 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].

4.4. 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.

4.5. ISO 771:2021/ ДСТУ ISO 771:2006 Moisture content, %

Moisture content, %			ISO 771:2021/ДСТУ ISO 771:2006								
Дослідження гомогенності/Homogeneity test											
Аналіз викидів за тестом Кохрана(C-тест)/Cohran's C test for outliers						Аналіз на 'достатню однорідність'/Test for 'sufficient homogeneity'					
Номер зразку/ Sample number	Результат/ Result A	Результат/ Result B	Average	SD ²		Номер зразку /Sample number	Результат/ Result A	Результат/ Result B	SUM	Difference ²	
1	10,43	10,38	10,405	0,0012	0,00	1	10,43	10,38	20,81	0,0025	
2	10,36	10,33	10,345	0,0004	0,00	2	10,36	10,33	20,69	0,0009	
3	10,38	10,42	10,400	0,0008	0,00	3	10,38	10,42	20,80	0,0016	
4	10,41	10,46	10,435	0,0013	0,00	4	10,41	10,46	20,87	0,0025	
5	10,50	10,48	10,490	0,0002	0,00	5	10,50	10,48	20,98	0,0004	
											0,0079
Mean	10,415		Worst pair	0,0013		Mean	10,415				
Max	10,50		SUM of SD ²	0,0039		Max	10,50				
Min	10,33		C	0,3165		Min	10,33				
			Ccr, 5%	0,8413							
			Ccr, 1%	0,9279		Analytical variance S ² an	0,0008	SD		0,0542	
			Conclusion			Sanal	0,0281	RSDR		0,5205	
			5% PASS			Ssums	0,0113				
			1% PASS			MSb	0,0056				
					Between sample variance S ² sam	0,0024					
Remarks											
1. Cohran's C test is described in ISO 5727-2 and ISO 13528:2022											
2. Test for 'sufficient homogeneity' is performed according to Annex B ISO 13528:2022											

Source of σ_p value to use	
Use(write '1')	Source
	C>13.8%, HORWITZ
1	120ppb<C<13.8%, HORWITZ
	C<120 ppb
MASS NEGATIVE POWER FOR HORWITZ EQUATION(%=2, ppb=9,ppm=6)	
	SD
	Trial SD
	Target SD chosen
	σ^2_{all}
	Replicates
	F1
	F2
	Critical value
	Between sample variance S ² sam
	Sufficient homogeneity test

4.6. Data for all analytes

4.6.1 Sample A (Soybean meal)

Method	ISO 771:2021/ ДСТУ ISO 771:2006	ISO 5983-1:2005/ ДСТУ EN ISO 5983-1:2022 (EN ISO 5983-1:2005, IDT; ISO 5983-1:2005, IDT)	ISO 14244:2014	ISO 5984:2022/ ДСТУ ISO 5984:2004	ISO 5985:2002/ ДСТУ ISO 5985:2004	ISO 734:2023/ ДСТУ ISO 734-1:2008	ISO 6865:2000/ ДСТУ EN ISO 6865:2022 (EN ISO 6865:2000, IDT; ISO 6865:2000, IDT)	ISO 5506:2018/ ДСТУ ISO 5506:2003	ДСТУ 7618:2014
	Moisture content, %	Crude protein content, % (expressed as a mass fraction of the product as received)	Soluble proteins in potassium hydroxide solution, g of soluble proteins per 100 g of the total protein	Crude ash, % (expressed as a mass fraction of the product as received)	Ash insoluble in hydrochloric acid, % (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)	Urease activity, milligrams of nitrogen liberated per minute per gram	Acid value of oil, mg KOH/g

Homogeneity and stability (Гомогенність та стабільність)

Cohran's 'C' test (C-тест "Кохрана")

Critical value (5%,5pairs)=0,8412	0,3165	0,5409	0,5004	0,5047	0,4700	0,6465	0,3669	0,43420	0,3636
Mean Result	10,4150	46,9580	79,9670	6,0994	0,0791	1,0210	3,8700	0,07250	15,2480
Conclusion (Висновок)	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS

Analytical variance test (тест аналітичної дисперсії)

S ² anal	0,0008	0,0042	0,0125	0,0105	0,0000	0,0010	0,0018	0,000002	0,0018
Sanal	0,0281	0,0645	0,1118	0,1024	0,0021	0,0315	0,0420	0,00133	0,0420
S ² sample	0,0024	0,0023	0,0000	0,0000	0,0000	0,0008	0,0010	0,00003	0,0044
σ _p	0,2928	0,6853	0,8942	0,1858	0,0046	0,0407	0,1263	0,0140	0,3905
σ _p source	Horwitz	Horwitz	Horwitz	Horwitz	Horwitz	Horwitz	Horwitz	Trial SD	Horwitz
σ ² all	0,0077	0,0423	0,0720	0,0031	0,000002	0,0001	0,0014	0,00002	0,0137
Critical value	0,0200	0,1090	0,1969	0,0293	0,000014	0,0024	0,0071	0,00005	0,0362
Conclusion (Висновок)	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS

4.6.2 Sample B (Rapeseed meal)

Method	ISO 771:2021/ ДСТУ ISO 771:2006	ISO 5983-1:2005/ ДСТУ EN ISO 5983-1:2022 (EN ISO 5983-1:2005, IDT; ISO 5983-1:2005, IDT)	ISO 14244:2014	ISO 5984:2022/ ДСТУ ISO 5984:2004	ISO 5985:2002/ Amd 1:2015/ ДСТУ ISO 5985:2004	ISO 734:2023/ ДСТУ EN ISO 734:2022 (EN ISO 734:2015, IDT; ISO 734:2015, IDT)	ISO 6865:2000/ ДСТУ EN ISO 6865:2022 (EN ISO 6865:2000, IDT; ISO 6865:2000, IDT)	ISO 660:2020/ ДСТУ EN ISO 660:2022 (EN ISO 660:2020, IDT; ISO 660:2020, IDT)	ДСТУ 8659:2016	ISO 9167:2019/ ДСТУ EN ISO 9167:2022 (EN ISO 9167:2019, IDT; ISO 9167:2019, IDT)/ ДСТУ ISO 9167-1:2007	ISO 12966-4:2026/ ДСТУ EN ISO 12966-4:2019 (EN ISO 12966-4:2015, IDT; ISO 12966-4:2015, IDT)/ ДСТУ ISO 5508:2001/ ДСТУ 7585:2014
	Moisture content, %	Crude protein content, % (expressed as a mass fraction of the product as received)	Soluble proteins in potassium hydroxide solution, g of soluble proteins per 100 g of the total protein	Crude ash, % (expressed as a mass fraction of the product as received)	Ash insoluble in hydrochloric acid, % (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)	Acid value of oil, mg KOH/g	Peroxide value of oil, $\frac{1}{2}$ O mmol/kg	Total glucosinolates content, μ mol/g of dry matter of the product	Erucic acid C22:1n9, % (Calculate the area fraction of the individual fatty acid methyl esters, expressed as a percentage by sum of areas under all peaks of all individual fatty acid methyl ester)

Homogeneity and stability (Гомогенність та стабільність)

Cohran's 'C' test (C-тест "Кохрана")

Critical value (5%,5pairs)=0,8412	0,7424	0,7934	0,5976	0,3828	0,5908	0,4848	0,2878	0,3926	0,7222	0,5972	0,3333
Mean Result	10,0420	35,0510	54,9260	6,2676	0,1012	1,4500	12,9158	17,2230	11,7440	15,1500	0,1350
Conclusion (Висновок)	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
Analytical variance test (тест аналітичної дисперсії)											
S ² anal	0,0007	0,0045	0,0033	0,0005	0,0000	0,0013	0,0035	0,0016	0,0023	0,2830	0,0000
Sanal	0,0257	0,0675	0,0573	0,0228	0,0008	0,0363	0,0589	0,0404	0,0484	0,5320	0,0055
S ² sample	0,0003	0,0010	0,0000	0,0007	0,0000	0,0000	0,0000	0,0062	0,0210	0,0000	0,0000
σ_p	0,2838	0,5920	0,7411	0,1902	0,0057	0,0548	0,3515	0,4150	3,0870	1,8700	0,0800
σ_p source	Horwitz	Horwitz	Horwitz	Horwitz	Horwitz	Horwitz	Horwitz	Horwitz	Trial SD	Method Tr SD	Method Tr SD
σ^2 all	0,00730	0,0315	0,0494	0,0033	0,0000	0,0003	0,0111	0,0155	0,8577	0,3147	0,0006
Critical value	0,01860	0,0844	0,1241	0,0088	0,0000	0,0034	0,0337	0,0402	2,0392	1,3397	0,0014
Conclusion (Висновок)	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS

5. DATA SUMMARY

5.1. Sample A (Soybean meal)

Method	ISO 771:2021/ ДСТУ ISO 771:2006	ISO 5983-2:2009/ ДСТУ EN ISO 5983-2:2022 (EN ISO 5983-2:2009, IDT; ISO 5983-2:2009, IDT)	ISO 14244:2014	ISO 5984:2022/ ДСТУ ISO 5984:2004	ISO 5985:2002/ ДСТУ ISO 5985:2004	ISO 734:2023/ ДСТУ ISO 734-1:2008	ISO 6865:2000/ ДСТУ EN ISO 6865:2022 (EN ISO 6865:2000, IDT; ISO 6865:2000, IDT)	ISO 6654:1991/ ДСТУ ISO 6654:2005	ISO 5506:2018/ ДСТУ ISO 5506:2003
	Moisture content, %	Crude protein content, % (expressed as a mass fraction of the product as received)	Soluble proteins in potassium hydroxide solution, g of soluble proteins per 100 g of the total protein	Crude ash, % (expressed as a mass fraction of the product as received)	Ash insoluble in hydrochloric acid, % (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)	Urea content, %	Urease activity, milligrams of nitrogen liberated per minute per gram
No of Results	14	15	9	16	15	16	13	4	6
No of Results z >3 or NS	0	0	0	0	1	0	0	0	0
No of Results z >3, % or NS,%	0,000	0,000	0,000	0,000	6,667	0,000	0,000	0,000	0,000
Mean	10,504	46,433	83,206	6,711	0,089	1,186	3,557		0,060
Min	10,200	44,530	77,760	6,400	0,050	0,920	3,270		0,050
Max	10,800	47,430	89,740	7,030	0,140	1,510	4,100		0,090
SD	0,174	0,714	3,645	0,207	0,025	0,171	0,255		0,017
Median	10,510	46,500	82,700	6,675	0,086	1,215	3,500		0,050
Robust mean (assigned value)	10,501	46,560	83,050	6,710	0,087	1,192	3,517		0,057
Robust SD	0,168	0,471	3,107	0,206	0,019	0,156	0,181		0,011
SD from method (Tr.SD)	N/A	0,90	3,04	0,11	0,034	0,25	0,383		N/A
SD from Horwitz eq.	0,295	0,682	0,911	0,202	0,005	0,046	0,116		0,014
Target SD	0,295	0,682	3,040	0,202	0,034	0,250	0,383		0,025
Source of target SD of PT	Horwitz	Horwitz	Method Tr SD	Horwitz	Method Tr SD	Method Tr SD	Method Tr SD		Trial SD

Method	ДСТУ 7621:2014	ДСТУ 7169:2010	ДСТУ 8076:2015	ДСТУ 9174:2022	ДСТУ 9174:2022	ДСТУ 7458:2013	ДСТУ 8844:2019 p.6.1	ДСТУ 8365:2015	ДСТУ 7618:2014
	Moisture content, %	Crude protein content, % (Expressed on absolute dry matter, factor for converting nitrogen content to protein content – 6,25) (moisture according to ДСТУ 7621:2014)	Mass fraction of soluble proteins in potassium hydroxide, %	Mass fraction of crude ash, % (expressed as a mass fraction of the dry product)	Mass fraction of ash insoluble in hydrochloric acid, % (expressed as a mass fraction of the dry product)	Mass fraction of crude fat, % (expressed as a mass fraction of the dry product)	Mass fraction of crude fibre, % (expressed as a mass fraction of the dry product)	Urease activity (change of pH for 30 min), pH units	Acid value of oil, mg KOH/g
No of Results	16	15	8	9	6	17	13	14	6
No of Results z >3 or NS	0	1	0	1	1	0	0	0	0
No of Results z >3, % or NS,%	0,000	6,667	0,000	11,111	16,667	0,000	0,000	0,000	0,000
Mean	10,506	51,859	81,399	7,208	0,100	1,311	3,993	0,063	17,443
Min	10,150	49,670	77,760	6,000	0,090	1,020	3,660	0,030	12,640
Max	10,920	53,340	83,380	7,690	0,110	1,670	4,450	0,090	20,490
SD	0,213	0,978	2,062	0,526	0,007	0,181	0,244	0,017	3,231
Median	10,520	51,980	82,245	7,250	0,100	1,340	3,920	0,062	17,995
Robust mean (assigned value)	10,495	52,030	81,529	7,298	0,100	1,314	3,976	0,064	17,443
Robust SD	0,198	0,508	1,817	0,323	0,007	0,151	0,215	0,014	3,231
SD from method (Tr.SD)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
SD from Horwitz eq.	0,295	0,721	0,903	0,216	0,006	0,050	0,129	N/A	0,418
Target SD	0,295	0,721	2,257	0,216	0,039	0,151	0,215	0,014	2,562
Source of target SD of PT	Horwitz	Horwitz	Trial SD	Horwitz	Trial SD	Trial SD	Trial SD	Trial SD	Trial SD

5.2 Sample B (Rapeseed meal)

Method	ISO 771:2021/ ДСТУ ISO 771:2006	ISO 5983-2:2009/ ДСТУ EN ISO 5983-2:2022 (EN ISO 5983-2:2009, IDT; ISO 5983-2:2009, IDT)	ISO 14244:2014	ISO 5984:2022/ ДСТУ ISO 5984:2004	ISO 5985:2002/ Amd 1:2015/ ДСТУ ISO 5985:2004	ISO 734:2023/ ДСТУ EN ISO 734:2022 (EN ISO 734:2015, IDT; ISO 734:2015, IDT)	ISO 6865:2000/ ДСТУ EN ISO 6865:2022 (EN ISO 6865:2000, IDT; ISO 6865:2000, IDT)	ДСТУ 7621:2014	ДСТУ 7169:2010
	Moisture content, %	Crude protein content, % (expressed as a mass fraction of the product as received)	Soluble proteins in potassium hydroxide solution, g of soluble proteins per 100 g of the total protein	Crude ash, % (expressed as a mass fraction of the product as received)	Ash insoluble in hydrochloric acid, % (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)	Moisture content, %	Crude protein content, % (Expressed on absolute dry matter, factor for converting nitrogen content to protein content – 6,25) (moisture according to ДСТУ 7621:2014)
No of Results	13	15	7	16	14	14	11	16	15
No of Results z >3 or NS	0	1	1	0	1	0	0	0	1
No of Results z >3, % or NS,%	0,000	6,667	14,286	0,000	7,143	0,000	0,000	0,000	6,667
Mean	10,165	34,883	53,254	6,543	0,070	1,836	12,975	10,217	38,828
Min	9,700	32,690	46,240	6,280	0,020	1,310	12,250	9,780	36,310
Max	10,500	36,000	70,570	6,900	0,150	2,160	13,850	10,720	39,810
SD	0,231	0,764	8,139	0,151	0,036	0,263	0,522	0,261	0,796
Median	10,130	35,020	51,630	6,540	0,070	1,900	12,990	10,174	38,900
Robust mean (assigned value)	10,181	35,017	51,308	6,530	0,068	1,832	12,963	10,206	38,943
Robust SD	0,217	0,359	3,758	0,102	0,030	0,237	0,500	0,224	0,374
SD from method (Tr.SD)	N/A	N/A	4,47	N/A	N/A	0,38	N/A	N/A	N/A
SD from Horwitz eq.	0,287	0,592	0,716	0,197	0,004	0,067	0,353	0,288	0,624
Target SD	0,287	0,592	4,470	0,197	0,030	0,380	0,500	0,288	0,624
Source of target SD of PT	Horwitz	Horwitz	Method Tr SD	Horwitz	Trial SD	Method Tr SD	Trial SD	Horwitz	Horwitz

Method	ДСТУ 8076:2015	ДСТУ 9174:2022	ДСТУ 9174:2022	ДСТУ 7458:2013	ДСТУ 8844:2019 p.6.1	ISO 660:2020/ ДСТУ EN ISO 660:2022 (EN ISO 660:2020, IDT; ISO 660:2020, IDT)	ДСТУ 8659:2016	ISO 9167:2019/ ДСТУ EN ISO 9167:2022 (EN ISO 9167:2019, IDT; ISO 9167:2019, IDT)/ ДСТУ ISO 9167-1:2007	ISO 12966-4:2026/ ДСТУ EN ISO 12966-4:2019 (EN ISO 12966-4:2015, IDT; ISO 12966-4:2015, IDT)/ ДСТУ ISO 5508:2001/ ДСТУ 7585:2014
	Mass fraction of soluble proteins in potassium hydroxide, %	Mass fraction of crude ash, % (expressed as a mass fraction of the dry product)	Mass fraction of ash insoluble in hydrochloric acid, % (expressed as a mass fraction of the dry product)	Mass fraction of crude fat, % (expressed as a mass fraction of the dry product)	Mass fraction of crude fibre, % (expressed as a mass fraction of the dry product)	Acid value of oil, mg KOH/g	Peroxide value of oil, ½O mmol/kg	Total glucosinolates content, µmol/g of dry matter of the product	Erucic acid C22:1n9, % (Calculate the area fraction of the individual fatty acid methyl esters, expressed as a percentage by sum of areas under all peaks of all individual fatty acid methyl ester)
No of Results	5	9	5	17	12	6	5	4	7
No of Results z >3 or NS	1	1	1	0	0	0	0	1	0
No of Results z >3, % or NS,%	20,000	11,111	20,000	0,000	0,000	0,000	0,000	25,000	0,000
Mean	56,498	7,060	0,108	2,022	14,829	14,642	10,064	15,448	0,091
Min	44,030	6,000	0,030	1,390	13,600	12,530	6,020	10,200	0,027
Max	70,880	7,380	0,170	2,429	15,920	17,050	13,140	21,920	0,130
SD	10,079	0,431	0,058	0,292	0,817	1,880	3,087	4,846	0,036
Median	55,150	7,110	0,115	2,150	14,615	13,940	11,590	14,835	0,100
Robust mean (assigned value)	55,860	7,155	0,108	2,021	14,829	14,642	10,064	13,290	0,094
Robust SD	4,624	0,202	0,058	0,253	0,816	1,880	3,087	2,701	0,030
SD from method (Tr.SD)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1,87	0,08
SD from Horwitz eq.	0,747	0,213	0,006	0,073	0,385	0,383	N/A	N/A	0,005
Target SD	4,624	0,213	0,058	0,253	0,816	1,880	3,087	1,870	0,080
Source of target SD of PT	Trial SD	Horwitz	Trial SD	Trial SD	Trial SD	Trial SD	Trial SD	Method Tr SD	Method Tr SD

6. RAW DATA

6.1. Sample A (Soybean meal)

Method	ISO 771:2021/ ДСТУ ISO 771:2006	ISO 5983-2:2009/ ДСТУ EN ISO 5983-2:2022 (EN ISO 5983-2:2009, IDT; ISO 5983-2:2009, IDT)	ISO 14244:2014	ISO 5984:2022/ ДСТУ ISO 5984:2004	ISO 5985:2002/ ДСТУ ISO 5985:2004	ISO 734:2023/ ДСТУ ISO 734-1:2008	ISO 6865:2000/ ДСТУ EN ISO 6865:2022 (EN ISO 6865:2000, IDT; ISO 6865:2000, IDT)	ISO 6654:1991/ ДСТУ ISO 6654:2005	ISO 5506:2018/ ДСТУ ISO 5506:2003
Laboratory number	Moisture content, %	Crude protein content, % (expressed as a mass fraction of the product as received)	Soluble proteins in potassium hydroxide solution, g of soluble proteins per 100 g of the total protein	Crude ash, % (expressed as a mass fraction of the product as received)	Ash insoluble in hydrochloric acid, % (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)	Urea content, %	Urease activity, milligrams of nitrogen liberated per minute per gram
1	10,39	46,93	80,01	6,50	0,08	1,02	3,86	<0.01	0,069
2									
3	10,50	46,50	83,44			1,28	4,10		0,05
4		46,20			0,06				
5	10,8	46,80	82,00	6,4	0,13	1,2	3,5	< 0,10	0,05
6	10,7	47,00	-	6,5	0,14	1,2	3,4	-	-
7	10,59	47,19	89,74	6,47	0,09	1,04	-	-	0,05
8	10,35	44,53		6,86		0,92			
9									
10				6,67	0,06	1,24	3,41		
11	10,20	46,48	84,47	6,60	0,11	1,23	3,93		
12	10,64	46,90		6,55	0,05	1,51	3,50		
13				7,03	0,08	1,44	3,59		
14				7,02	0,08				
15	10,36	-	-	6,68	0,09	1,27	3,40	-	-
16									
17	10,73	46,35	77,76	6,97	0,09	1,03	3,27	є виявлено (<0.25)	
18		46,01		6,85			3,33		
19	10,39	46,51	82,70	6,93	0,08	1,27	3,59	absent	0,09
20									
21									
22	10,52	45,68	87,34	6,64	0,10	0,95	3,36		
23	-	-	-	6,7	<0,01	-	-	-	-
24	10,34	47,43	81,39			1,33			0,05
25	10,54	45,98				1,04			

Method	ДСТУ 7621:2014	ДСТУ 7169:2010	ДСТУ 8076:2015	ДСТУ 9174:2022	ДСТУ 9174:2022	ДСТУ 7458:2013	ДСТУ 8844:2019 р.6.1	ДСТУ 8365:2015	ДСТУ 7643:2014	ДСТУ 7618:2014
Laboratory number	Moisture content, %	Crude protein content, % (Expressed on absolute dry matter, factor for converting nitrogen content to protein content – 6,25) (moisture according to ДСТУ 7621:2014)	Mass fraction of soluble proteins in potassium hydroxide, %	Mass fraction of crude ash, % (expressed as a mass fraction of the dry product)	Mass fraction of ash insoluble in hydrochloric acid, % (expressed as a mass fraction of the dry product)	Mass fraction of crude fat, % (expressed as a mass fraction of the dry product)	Mass fraction of crude fibre, % (expressed as a mass fraction of the dry product)	Urease activity (change of pH for 30 min), pH units	Active acidity (pH), pH units	Acid value of oil, mg KOH/g
1	10,15	51,98	81,00	6,86	0,09	1,13	4,26	0,06		15,20
2										
3										
4	10,40		78,86			1,25	3,92	0,06		
5	-	-	-	-	-	-	-	0,05	-	-
6	-	-	-	-	-	-	-	-	-	-
7	10,62	52,80	-	7,24	0,10	1,17	4,36	0,07	-	19,70
8		49,67		7,65		1,02				16,29
9	10,70	52,13		7,69		1,34	3,86	0,07		
10	10,30	51,83	82,49			1,38	3,80	0,06		
11	10,35	49,96				1,22	4,45			
12	10,68	51,90				1,67				
13	10,45	52,37	83,38			1,61	4,01	0,06		
14		52,27	82,52			1,42	3,84	0,08		
15	10,38	-	-	7,16	0,10	1,23	3,81	-	-	-
16	10,70	52,45		6,00				0,03		
17			77,76				3,66	0,08	6,74	20,49
18								0,039		
19	10,37	51,82	82,00	7,60	0,10	1,49	4,07	0,09		12,64
20	10,59	52,47				1,34				
21	10,92	53,34				1,39				20,34
22	10,20	51,05	83,18	7,42	0,11	1,06	3,76	0,06		
23	10,7	51,84	-	7,25	<0,01	1,41	4,1	0,08	-	-
24										
25	10,59					1,16				

6.2 Sample B (Rapeseed meal)

Method	ISO 771:2021/ ДСТУ ISO 771:2006	ISO 5983-2:2009/ ДСТУ EN ISO 5983-2:2022 (EN ISO 5983-2:2009, IDT; ISO 5983-2:2009, IDT)	ISO 14244:2014	ISO 5984:2022/ ДСТУ ISO 5984:2004	ISO 5985:2002/ Amd 1:2015/ ДСТУ ISO 5985:2004	ISO 734:2023/ ДСТУ EN ISO 734:2022 (EN ISO 734:2015, IDT; ISO 734:2015, IDT)	ISO 6865:2000/ ДСТУ EN ISO 6865:2022 (EN ISO 6865:2000, IDT; ISO 6865:2000, IDT)	ДСТУ 7621:2014	ДСТУ 7169:2010
Laboratory number	Moisture content, %	Crude protein content, % (expressed as a mass fraction of the product as received)	Soluble proteins in potassium hydroxide solution, g of soluble proteins per 100 g of the total protein	Crude ash, % (expressed as a mass fraction of the product as received)	Ash insoluble in hydrochloric acid, % (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)	Moisture content, %	Crude protein content, % (Expressed on absolute dry matter, factor for converting nitrogen content to protein content – 6,25) (moisture according to ДСТУ 7621:2014)
1	10,04	35,02	54,85	6,28	0,09	1,45	12,88	9,78	38,79
2									
3	10,30	36,00				1,91			
4		34,36			0,05			10,08	
5	10,5	35,29	48,93	6,45	0,06	1,75	13,30	-	-
6	10,5	35,41	-	6,41	0,07	1,80	13,12	-	-
7	10,17	35,10	48,43	6,38	0,11	2,16	-	10,14	39,06
8	9,98	32,69		6,64		1,31			36,31
9								10,60	38,46
10				6,53	0,05	1,94	12,25	9,90	38,60
11	9,70	34,86	46,24	6,60	0,07	1,89	12,99	10,20	
12	10,30	35,10		6,51	0,03	1,95	12,40	10,34	38,90
13				6,47	0,04			10,20	39,24
14				6,43	0,08			10,05	38,65
15	9,97	35,00	-	6,58	-	2,04	13,53	10,00	38,90
16								10,20	38,65
17	10,41	33,96	51,63	6,77	0,10	2,16	12,40		
18		34,95		6,59			13,41		
19	10,09	35,02	52,13	6,60	0,02	1,77	12,60	10,09	39,21
20								10,72	39,55
21								10,62	39,81
22	10,06	35,50	70,57	6,55	0,15	1,49	13,85		39,5
23				6,9	<0,01			10,4	38,82
24									
25	10,13	34,98				2,08		10,15	

Method	ДСТУ 8076:2015	ДСТУ 9174:2022	ДСТУ 9174:2022	ДСТУ 7458:2013	ДСТУ 8844:2019 p.6.1	ISO 660:2020/ ДСТУ EN ISO 660:2022 (EN ISO 660:2020, IDT; ISO 660:2020, IDT)	ДСТУ 8659:2016	ISO 9167:2019/ ДСТУ EN ISO 9167:2022 (EN ISO 9167:2019, IDT; ISO 9167:2019, IDT)/ ДСТУ ISO 9167-1:2007	ISO 12966-4:2026/ ДСТУ EN ISO 12966-4:2019 (EN ISO 12966-4:2015, IDT; ISO 12966-4:2015, IDT)/ ДСТУ ISO 5508:2001/ ДСТУ 7585:2014
Laboratory number	Mass fraction of soluble proteins in potassium hydroxide, %	Mass fraction of crude ash, % (expressed as a mass fraction of the dry product)	Mass fraction of ash insoluble in hydrochloric acid, % (expressed as a mass fraction of the dry product)	Mass fraction of crude fat, % (expressed as a mass fraction of the dry product)	Mass fraction of crude fibre, % (expressed as a mass fraction of the dry product)	Acid value of oil, mg KOH/g	Peroxide value of oil, $\frac{1}{2}$ O mmol/kg	Total glucosinolates content, μ mol/g of dry matter of the product	Erucic acid C22:1n9, % (Calculate the area fraction of the individual fatty acid methyl esters, expressed as a percentage by sum of areas under all peaks of all individual fatty acid methyl ester)
1	55,15	6,92	0,11	1,59	14,27	17,05	11,59	15,20	0,13
2									
3									
4	44,03			2,22	15,77				
5	-	-	-	-	-	-	-	-	0,09
6	-	-	-	-	-	-	-	-	-
7	-	7,10	0,12	1,76	15,92	16,90	-	-	-
8		7,38		1,39		12,53	6,02		
9		7,38		2,22	15,38				
10				2,15	13,60				
11						13,94	12,00	14,47	0,10
12				2,16					
13				2,43	14,44				
14				2,15	14,49				
15	-	7,02	-	2,16	14,74	-	-	-	-
16		6,00							
17	51,63			2,40	13,84	13,94	7,57		0,12
18									0,06
19	60,80	7,35	0,03	2,00	14,19	13,49		10,20	0,11
20				1,89					
21				1,98			13,14		
22	70,88	7,28	0,17	1,66	15,40				
23	-	7,11	<0,01	1,9	15,9	-	-	-	0,027
24									
25				2,31				21,92	

7. Z SCORES

7.1. Sample A (Soybean meal)

Method	ISO 771:2021/ ДСТУ ISO 771:2006	ISO 5983-2:2009/ ДСТУ EN ISO 5983-2:2022 (EN ISO 5983-2:2009, IDT; ISO 5983-2:2009, IDT)	ISO 14244:2014	ISO 5984:2022/ ДСТУ ISO 5984:2004	ISO 5985:2002/ ДСТУ ISO 5985:2004	ISO 734:2023/ ДСТУ ISO 734-1:2008	ISO 6865:2000/ ДСТУ EN ISO 6865:2022 (EN ISO 6865:2000, IDT; ISO 6865:2000, IDT)	ISO 6654:1991/ ДСТУ ISO 6654:2005	ISO 5506:2018/ ДСТУ ISO 5506:2003
Laboratory number	Moisture content, %	Crude protein content, % (expressed as a mass fraction of the product as received)	Soluble proteins in potassium hydroxide solution, g of soluble proteins per 100 g of the total protein	Crude ash, % (expressed as a mass fraction of the product as received)	Ash insoluble in hydrochloric acid, % (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)	Urea content, %	Urease activity, milligrams of nitrogen liberated per minute per gram
1	-0,38	0,54	-1,00	-1,04	-0,19	-0,69	0,90	S	0,47
2									
3	0,00	-0,09	0,13			0,35	1,53		-0,29
4		-0,53			-0,78				
5	1,01	0,35	-0,35	-1,54	1,28	0,03	-0,04	S	-0,29
6	0,68	0,64		-1,04	1,57	0,03	-0,30		
7	0,30	0,92	2,20	-1,19	0,10	-0,61			-0,29
8	-0,51	-2,98		0,74		-1,09			
9									
10				-0,20	-0,78	0,19	-0,28		
11	-1,02	-0,12	0,47	-0,55	0,69	0,15	1,08		
12	0,47	0,50		-0,79	-1,07	1,27	-0,04		
13				1,59	-0,11	0,99	0,19		
14				1,54	-0,19				
15	-0,48			-0,15	0,10	0,31	-0,30		
16									
17	0,78	-0,31	-1,74	1,29	0,10	-0,65	-0,64	S	
18		-0,81		0,70			-0,49		
19	-0,38	-0,07	-0,12	1,09	-0,19	0,31	0,19	S	1,31
20									
21									
22	0,06	-1,29	1,41	-0,35	0,40	-0,97	-0,41		
23				-0,05	NS				
24	-0,55	1,27	-0,55			0,55			-0,29
25	0,13	-0,85				-0,61			

Method	ДСТУ 7621:2014	ДСТУ 7169:2010	ДСТУ 8076:2015	ДСТУ 9174:2022	ДСТУ 9174:2022	ДСТУ 7458:2013	ДСТУ 8844:2019 p.6.1	ДСТУ 8365:2015	ДСТУ 7618:2014
Laboratory number	Moisture content, %	Crude protein content, % (Expressed on absolute dry matter, factor for converting nitrogen content to protein content – 6,25) (moisture according to ДСТУ 7621:2014)	Mass fraction of soluble proteins in potassium hydroxide, %	Mass fraction of crude ash, % (expressed as a mass fraction of the dry product)	Mass fraction of ash insoluble in hydrochloric acid, % (expressed as a mass fraction of the dry product)	Mass fraction of crude fat, % (expressed as a mass fraction of the dry product)	Mass fraction of crude fibre, % (expressed as a mass fraction of the dry product)	Urease activity (change of pH for 30 min), pH units	Acid value of oil, mg KOH/g
1	-1,17	-0,07	-0,23	-2,02	-0,26	-1,22	1,32	-0,32	-0,88
2									
3									
4	-0,32		-1,18			-0,42	-0,26	-0,32	
5								-1,06	
6									
7	0,42	1,07		-0,27	0,00	-0,95	1,78	0,42	0,88
8		-3,27		1,63		-1,94			-0,45
9	0,69	0,14		1,81		0,17	-0,54	0,42	
10	-0,66	-0,28	0,43			0,43	-0,82	-0,32	
11	-0,49	-2,87				-0,62	2,20		
12	0,63	-0,18				2,35			
13	-0,15	0,48	0,82			1,94	0,18	-0,08	
14		0,33	0,44			0,70	-0,63	1,15	
15	-0,39			-0,64	0,00	-0,56	-0,77		
16	0,69	0,58		-6,00				-2,53	
17			-1,67				-1,47	1,15	1,19
18								-1,87	
19	-0,43	-0,29	0,21	1,39	0,00	1,16	0,44	1,89	-1,87
20	0,32	0,61				0,17			
21	1,44	1,82				0,50			1,13
22	-1,00	-1,36	0,73	0,56	0,26	-1,68	-1,01	-0,69	
23	0,69	-0,26		-0,22	NS	0,63	0,58	1,15	
24									
25	0,32					-1,02			

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

7.2 Sample B (Rapeseed meal)

Method	ISO 771:2021/ ДСТУ ISO 771:2006	ISO 5983-2:2009/ ДСТУ EN ISO 5983-2:2022 (EN ISO 5983-2:2009, IDT; ISO 5983-2:2009, IDT)	ISO 14244:2014	ISO 5984:2022/ ДСТУ ISO 5984:2004	ISO 5985:2002/ Amd 1:2015/ ДСТУ ISO 5985:2004	ISO 734:2023/ ДСТУ EN ISO 734:2022 (EN ISO 734:2015, IDT; ISO 734:2015, IDT)	ISO 6865:2000/ ДСТУ EN ISO 6865:2022 (EN ISO 6865:2000, IDT; ISO 6865:2000, IDT)	ДСТУ 7621:2014	ДСТУ 7169:2010
Laboratory number	Moisture content, %	Crude protein content, % (expressed as a mass fraction of the product as received)	Soluble proteins in potassium hydroxide solution, g of soluble proteins per 100 g of the total protein	Crude ash, % (expressed as a mass fraction of the product as received)	Ash insoluble in hydrochloric acid, % (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)	Moisture content, %	Crude protein content, % (Expressed on absolute dry matter, factor for converting nitrogen content to protein content – 6,25) (moisture according to ДСТУ 7621:2014)
1	-0,49	0,01	0,79	-1,27	0,75	-1,00	-0,17	-1,48	-0,24
2									
3	0,41	1,66				0,21			
4		-1,11			-0,60			-0,44	
5	1,11	0,46	-0,53	-0,41	-0,26	-0,21	0,67		
6	1,11	0,66		-0,61	0,07	-0,08	0,31		
7	-0,04	0,14	-0,64	-0,76	1,42	0,86		-0,23	0,19
8	-0,70	-3,93		0,56		-1,37			-4,22
9								1,37	-0,77
10				0,00	-0,60	0,29	-1,42	-1,06	-0,55
11	-1,68	-0,26	-1,13	0,36	0,07	0,15	0,05	-0,02	
12	0,41	0,14		-0,10	-1,27	0,31	-1,13	0,46	-0,07
13				-0,32	-1,08			-0,03	0,48
14				-0,51	0,41			-0,54	-0,47
15	-0,74	-0,03		0,25		0,55	1,13	-0,72	-0,07
16								-0,02	-0,47
17	0,80	-1,79	0,07	1,22	1,08	0,86	-1,13		
18		-0,11		0,30			0,89		
19	-0,32	0,01	0,18	0,36	-1,61	-0,16	-0,73	-0,40	0,43
20								1,78	0,97
21								1,44	1,39
22	-0,42	0,82	4,31	0,10	2,77	-0,90	1,77		0,84
23				1,88	NS			0,67	-0,20
24									
25	-0,18	-0,06				0,65		-0,20	

Method	ДСТУ 8076:2015	ДСТУ 9174:2022	ДСТУ 9174:2022	ДСТУ 7458:2013	ДСТУ 8844:2019 p.6.1	ISO 660:2020/ ДСТУ EN ISO 660:2022 (EN ISO 660:2020, IDT; ISO 660:2020, IDT)	ДСТУ 8659:2016	ISO 9167:2019/ ДСТУ EN ISO 9167:2022 (EN ISO 9167:2019, IDT; ISO 9167:2019, IDT)/ ДСТУ ISO 9167-1:2007	ISO 12966-4:2026/ ДСТУ EN ISO 12966-4:2019 (EN ISO 12966- 4:2015, IDT; ISO 12966-4:2015, IDT)/ ДСТУ ISO 5508:2001/ ДСТУ 7585:2014
Laboratory number	Mass fraction of soluble proteins in potassium hydroxide, %	Mass fraction of crude ash, % (expressed as a mass fraction of the dry product)	Mass fraction of ash insoluble in hydrochloric acid, % (expressed as a mass fraction of the dry product)	Mass fraction of crude fat, % (expressed as a mass fraction of the dry product)	Mass fraction of crude fibre, % (expressed as a mass fraction of the dry product)	Acid value of oil, mg KOH/g	Peroxide value of oil, ½O mmol/kg	Total glucosinolates content, µmol/g of dry matter of the product	Erucic acid C22:1n9, % (Calculate the area fraction of the individual fatty acid methyl esters, expressed as a percentage by sum of areas under all peaks of all individual fatty acid methyl ester)
1	-0,15	-1,10	0,04	-1,70	-0,69	1,28	0,49	1,02	0,45
2									
3									
4	-2,56			0,79	1,15				
5									-0,05
6									
7		-0,26	0,22	-1,03	1,34	1,20			
8		1,06		-2,50		-1,12	-1,31		
9		1,06		0,79	0,68				
10				0,51	-1,51				
11						-0,37	0,63	0,63	0,07
12				0,55					
13				1,62	-0,47				
14				0,51	-0,42				
15		-0,63		0,55	-0,11				
16		-5,43							
17	-0,91			1,50	-1,21	-0,37	-0,81		0,33
18									-0,43
19	1,07	0,92	-1,34	-0,08	-0,78	-0,61		-1,65	0,20
20				-0,52					
21				-0,16			1,00		
22	3,25	0,59	1,08	-1,43	0,70				
23		-0,21	NS	-0,48	1,31				-0,84
24									
25				1,14				4,61	

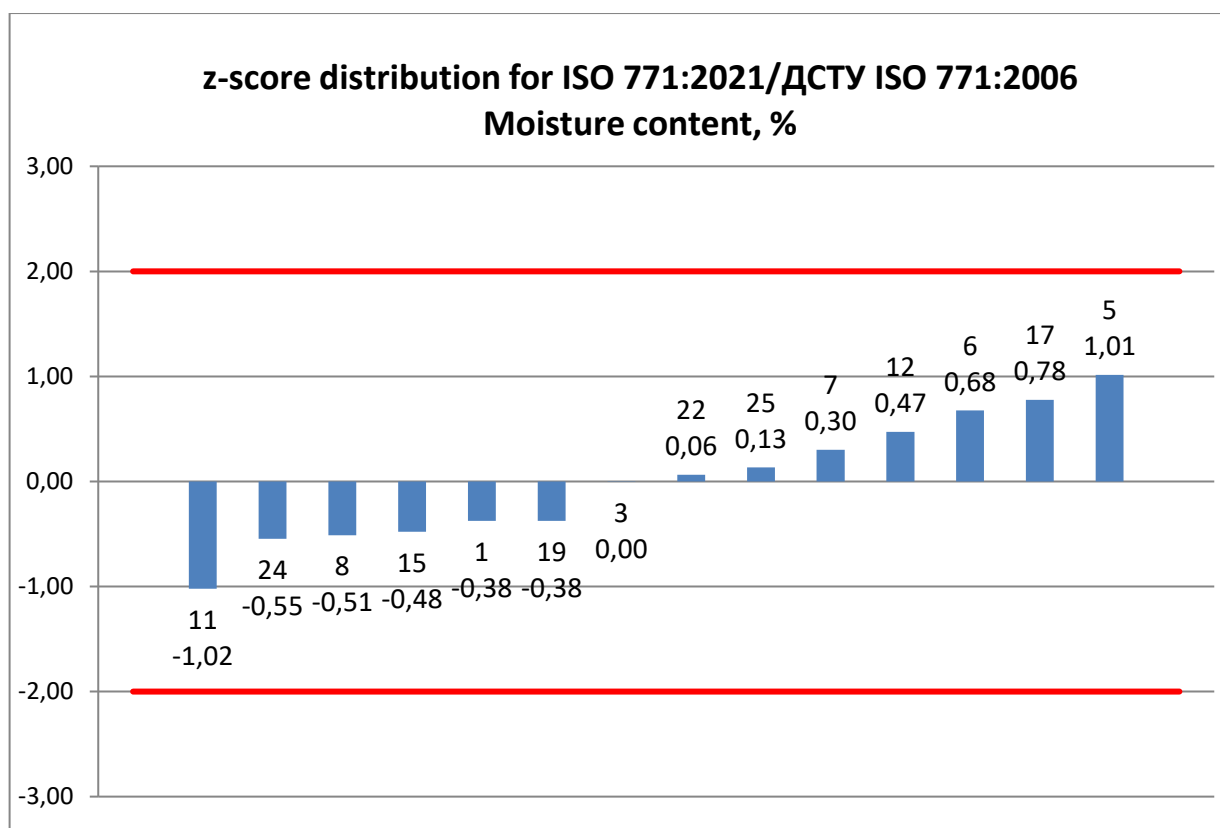
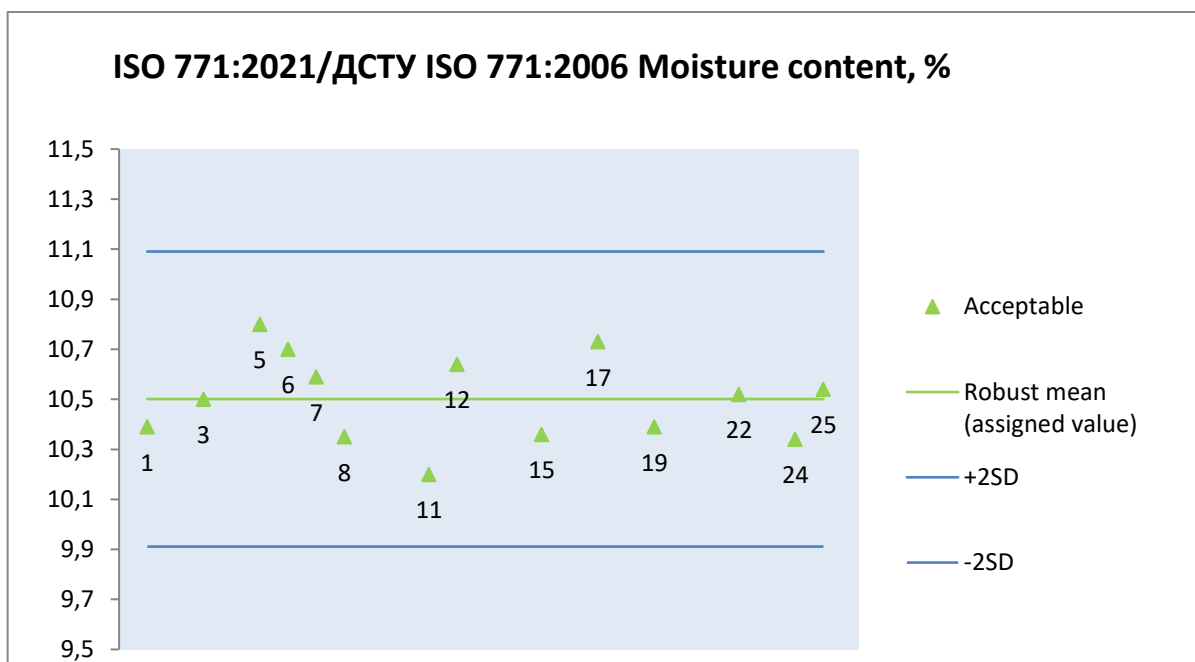
Remarks

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

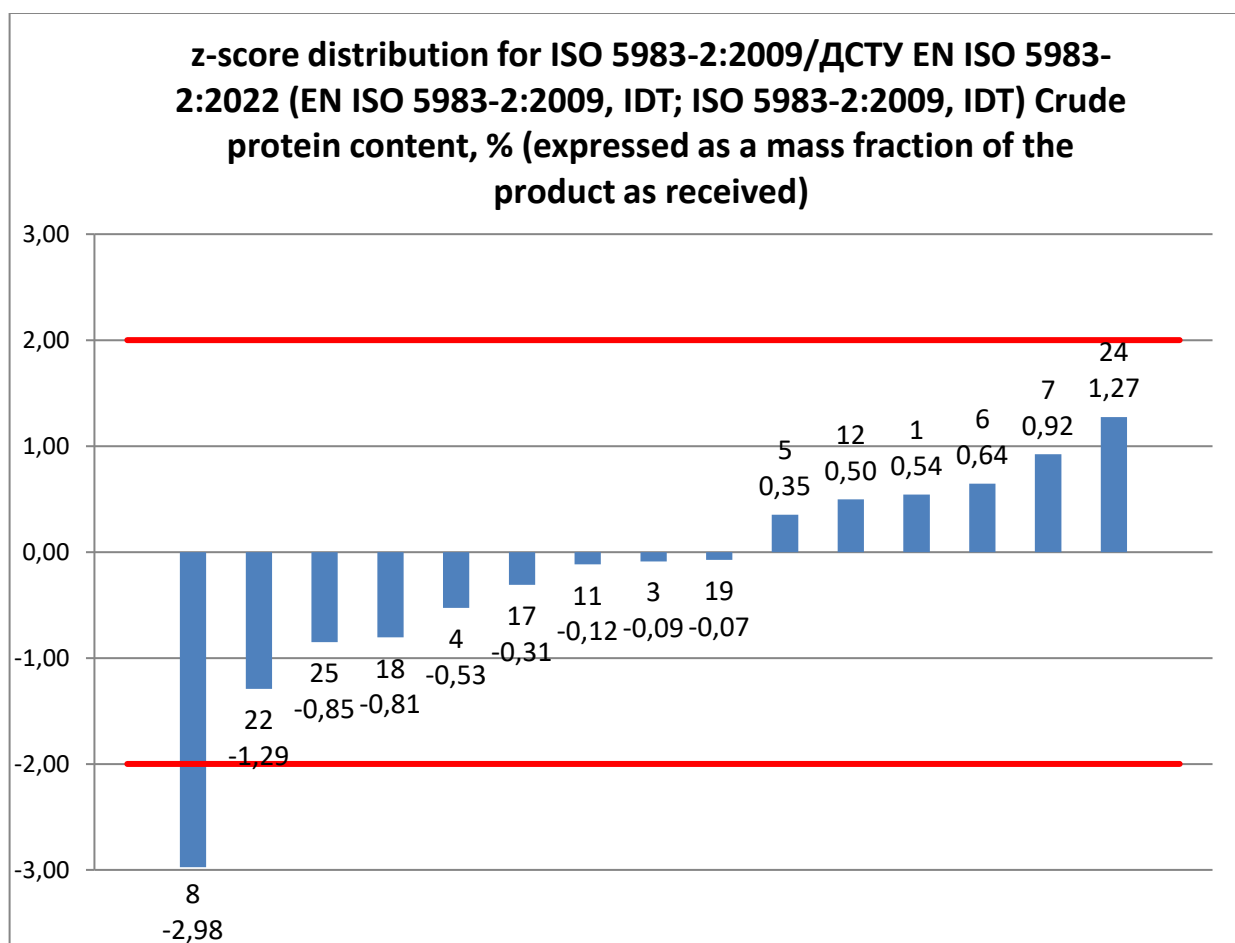
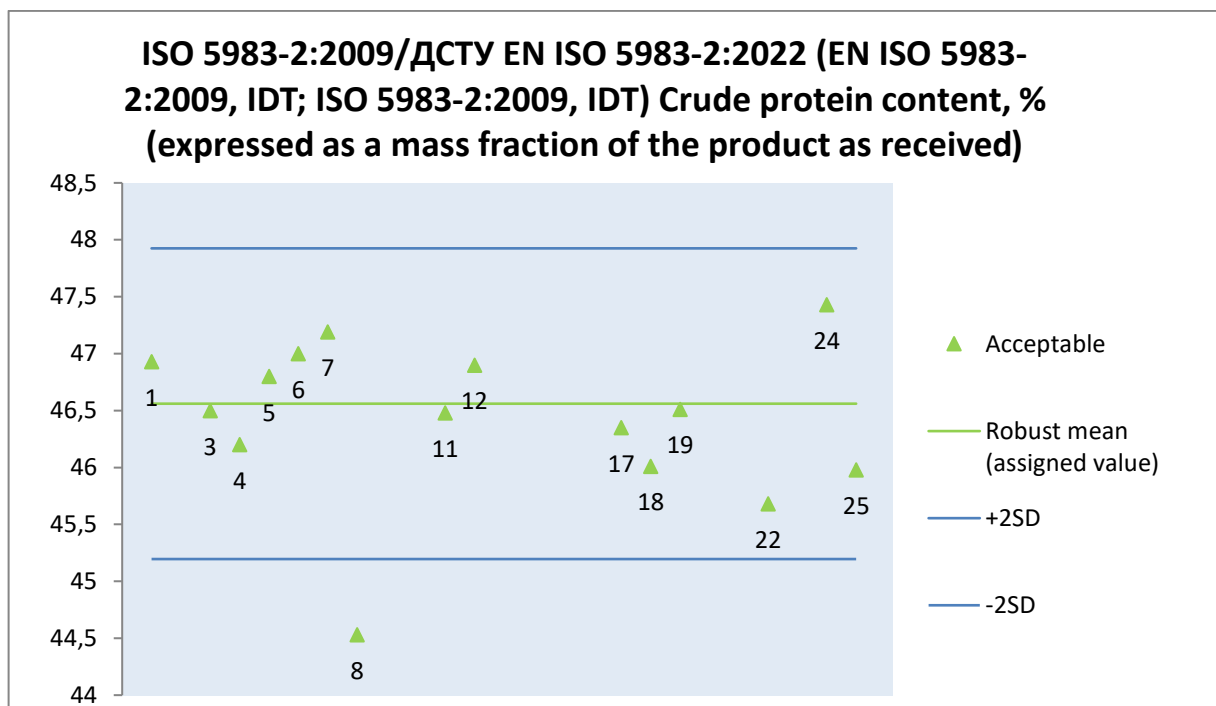
8. Z SCORE PLOTS AND RESULTS CHARTS.

8.1. Sample A (Soybean meal)

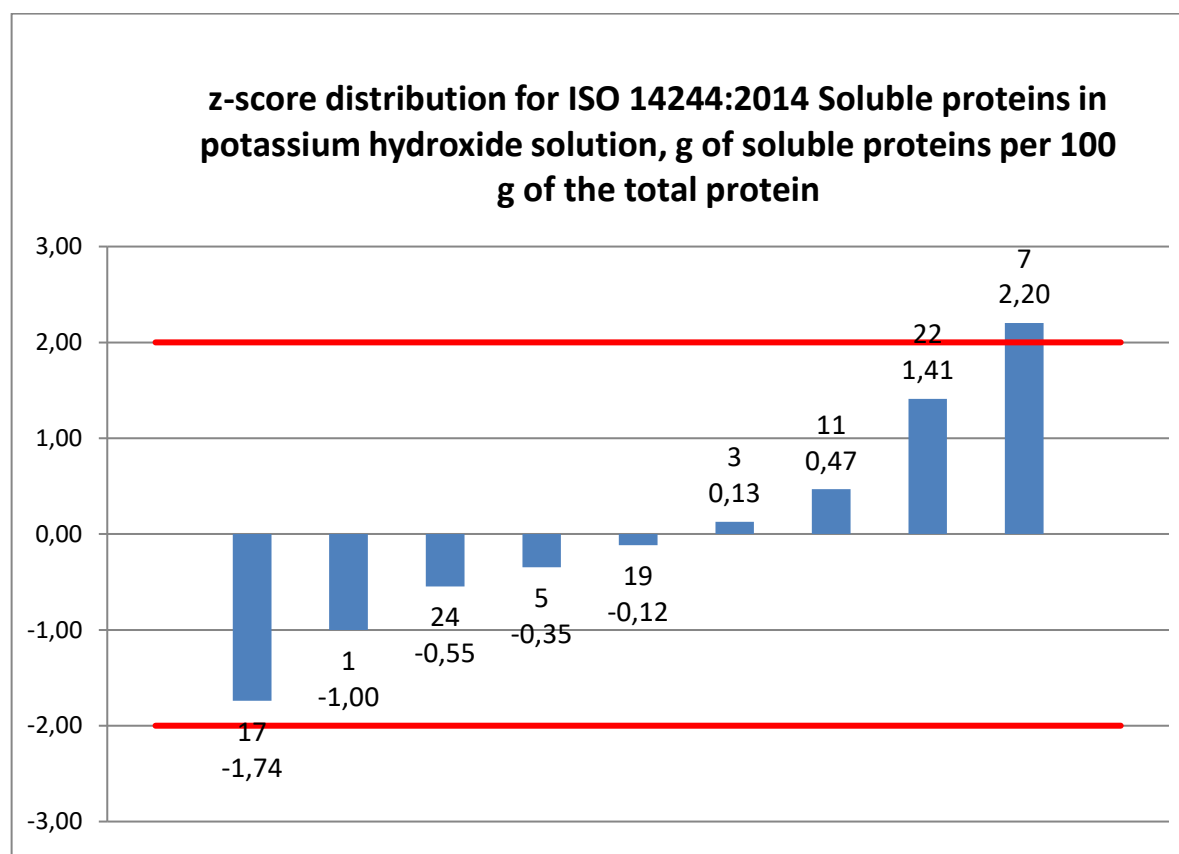
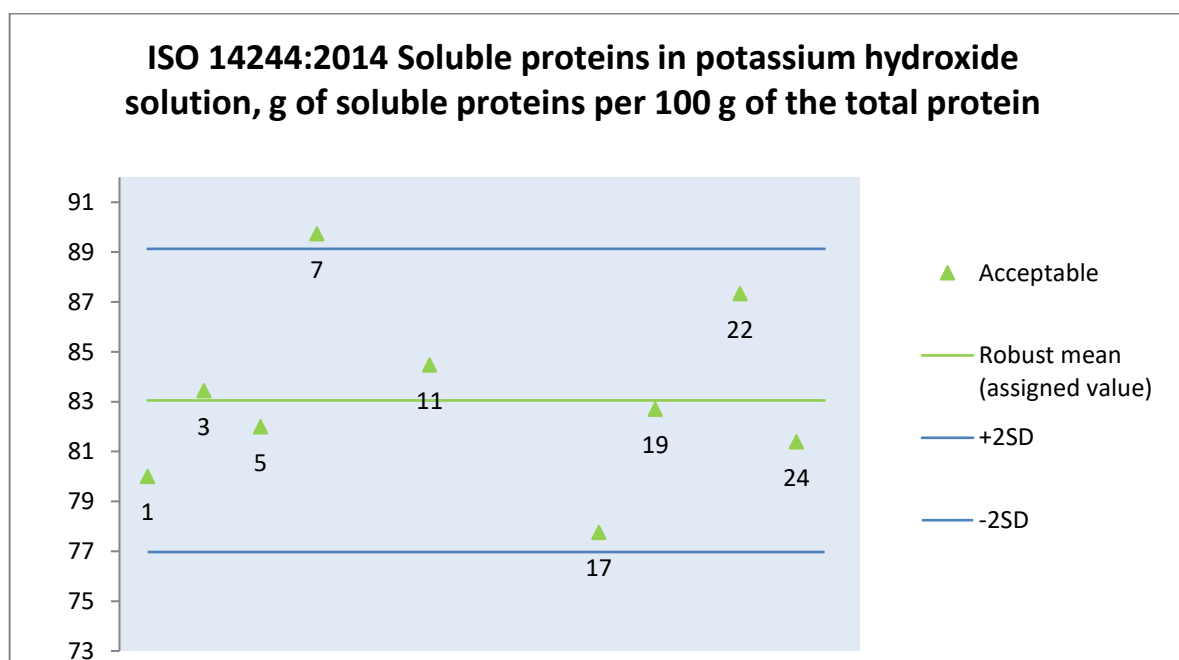
8.1.1. ISO 771:2021/ДСТУ ISO 771:2006 Moisture content, %



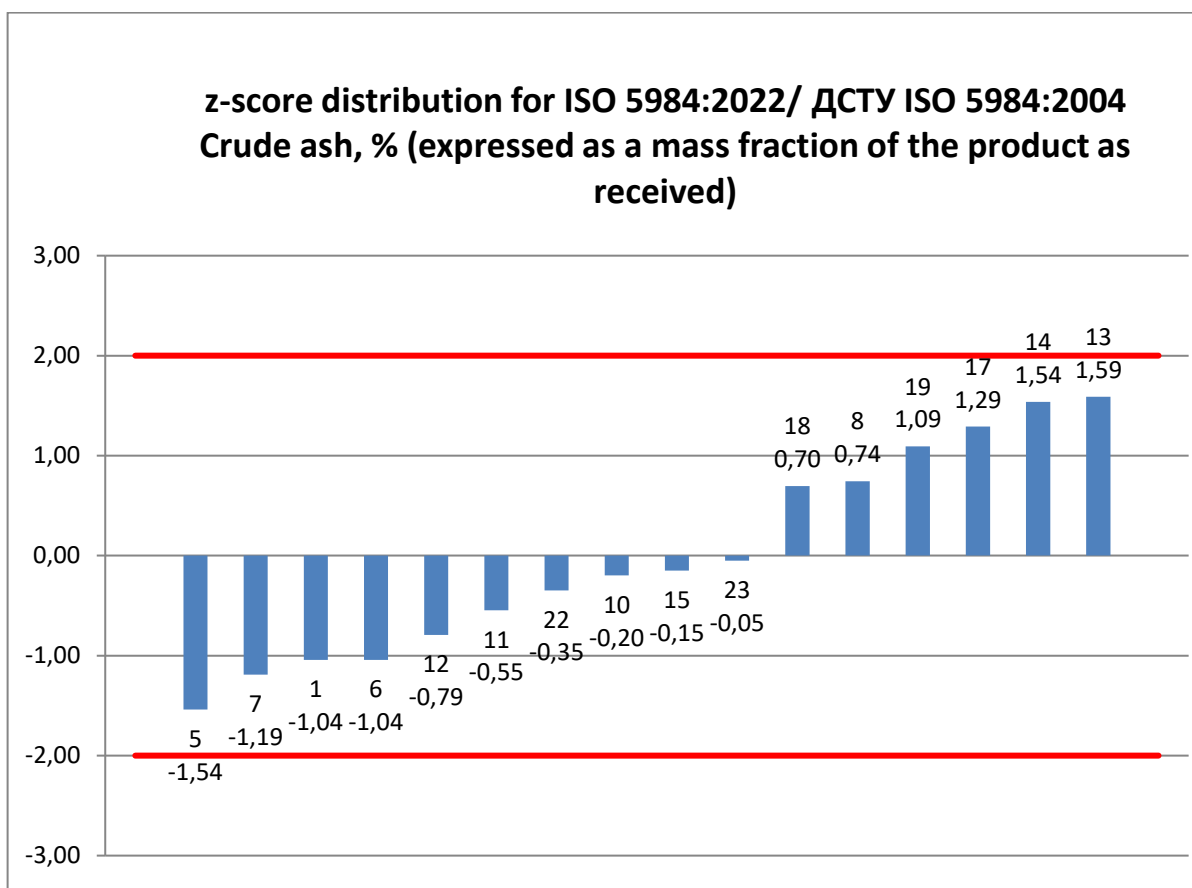
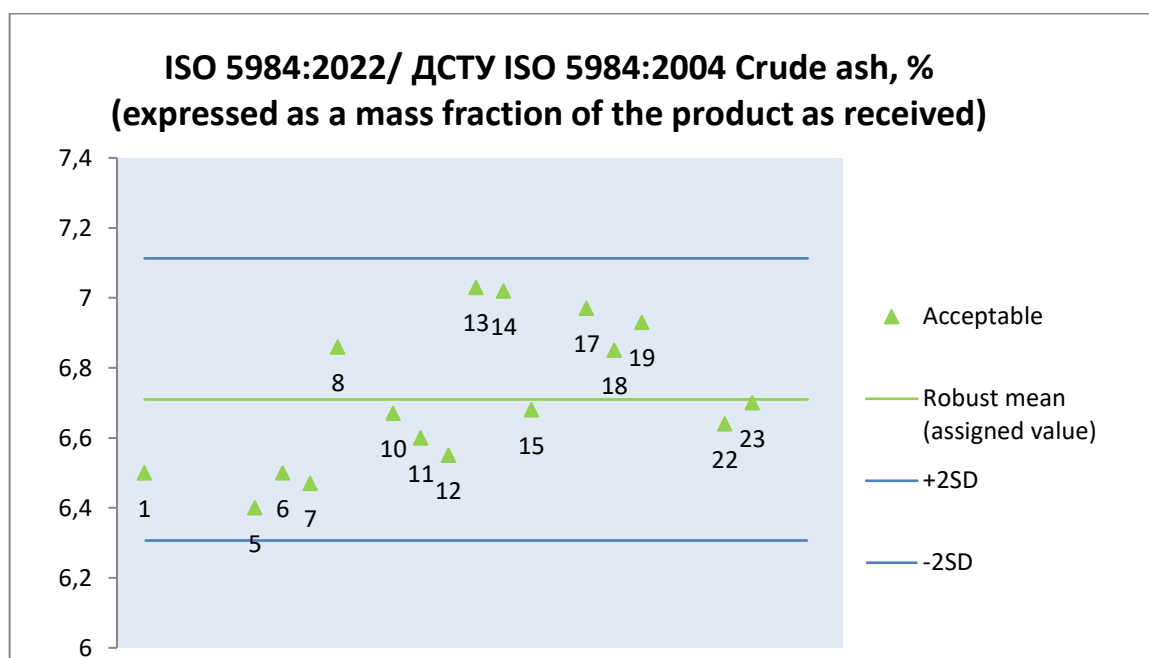
8.1.2. ISO 5983-2:2009/ДСТУ EN ISO 5983-2:2022 (EN ISO 5983-2:2009, IDT; ISO 5983-2:2009, IDT) Crude protein content, % (expressed as a mass fraction of the product as received)



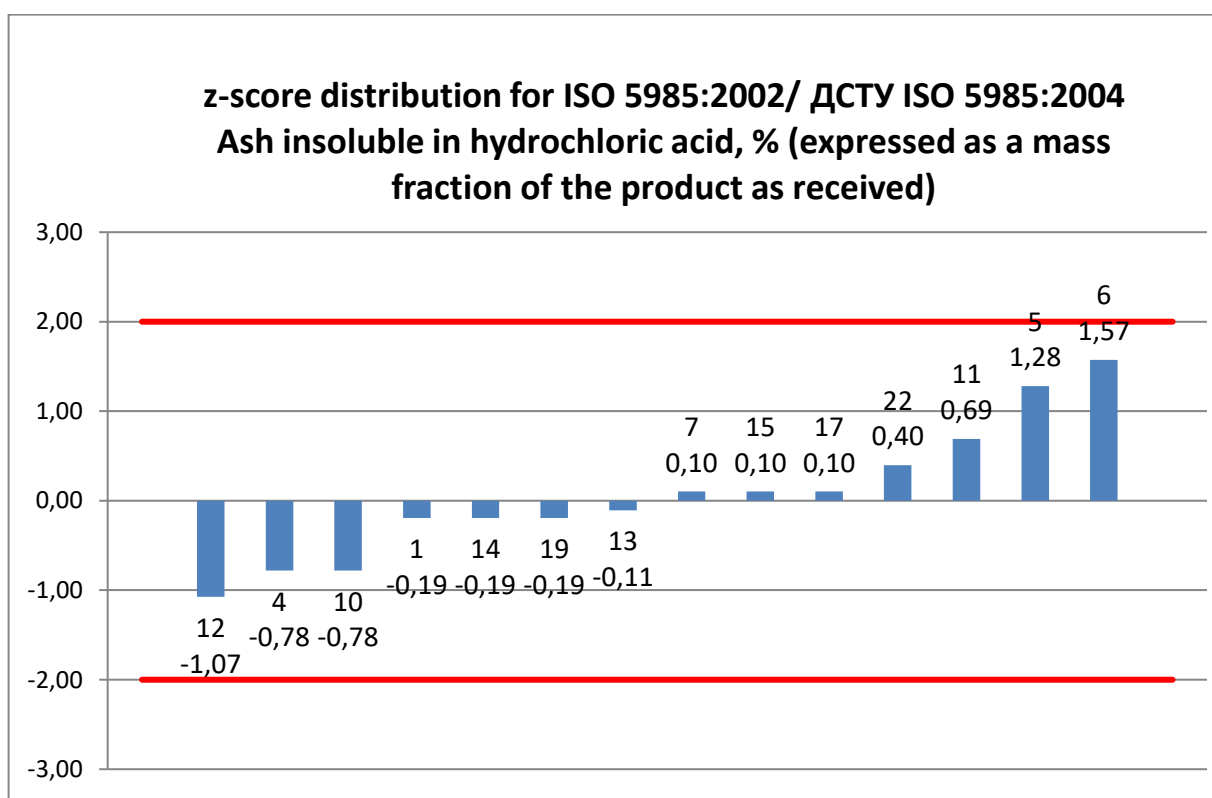
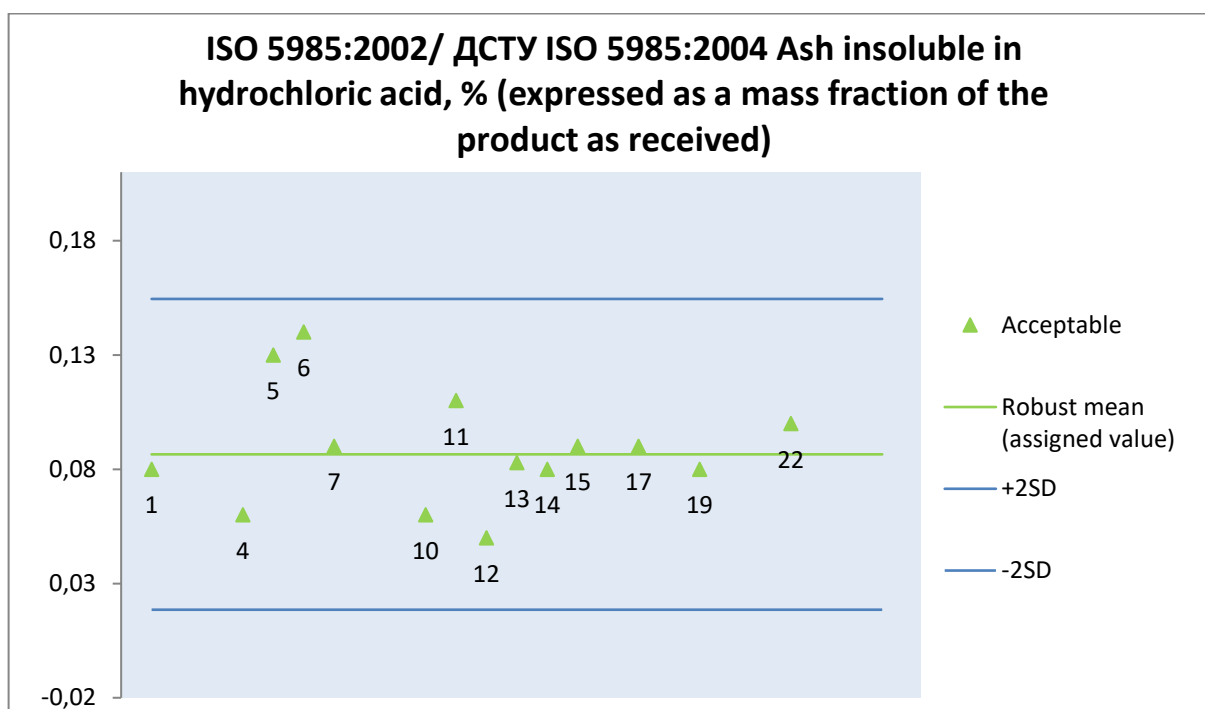
8.1.3. ISO 14244:2014 Soluble proteins in potassium hydroxide solution, g of soluble proteins per 100 g of the total protein



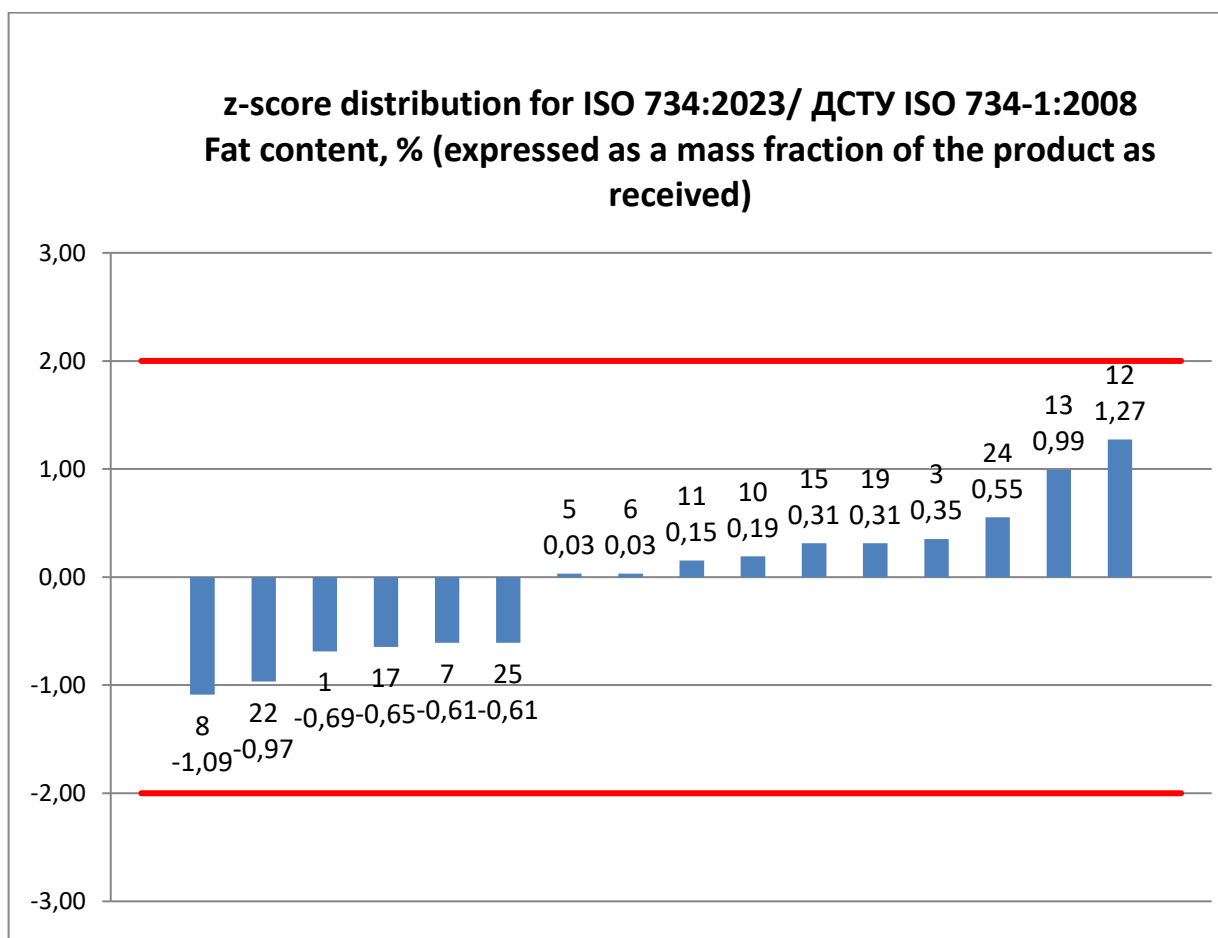
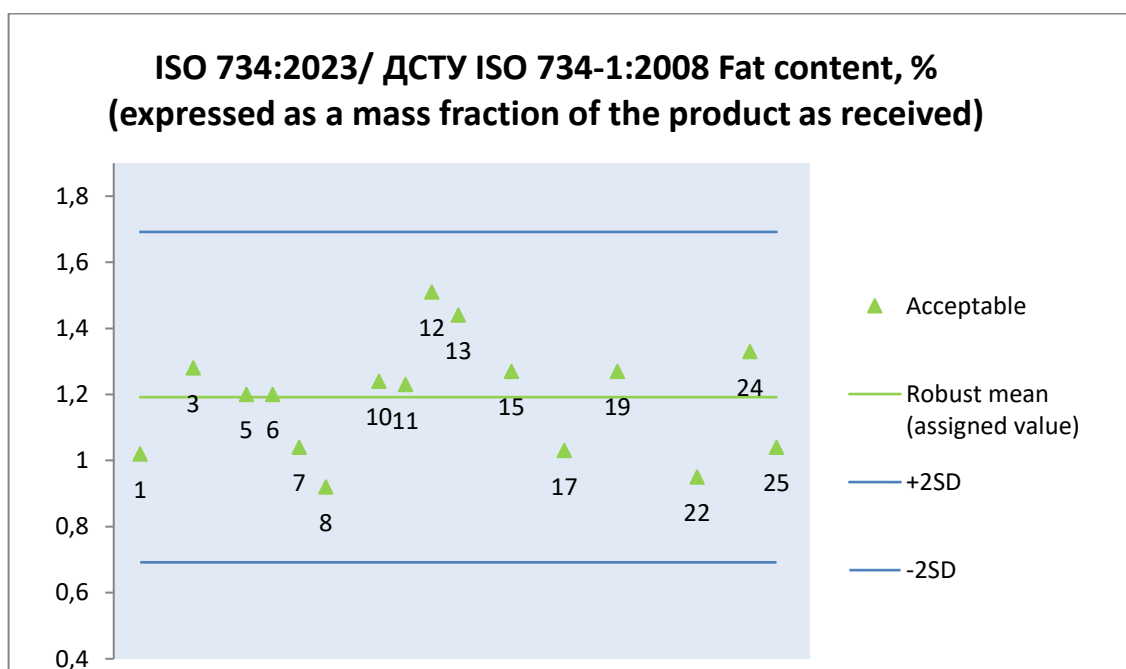
8.1.4. ISO 5984:2022/ ДСТУ ISO 5984:2004 Crude ash, % (expressed as a mass fraction of the product as received)



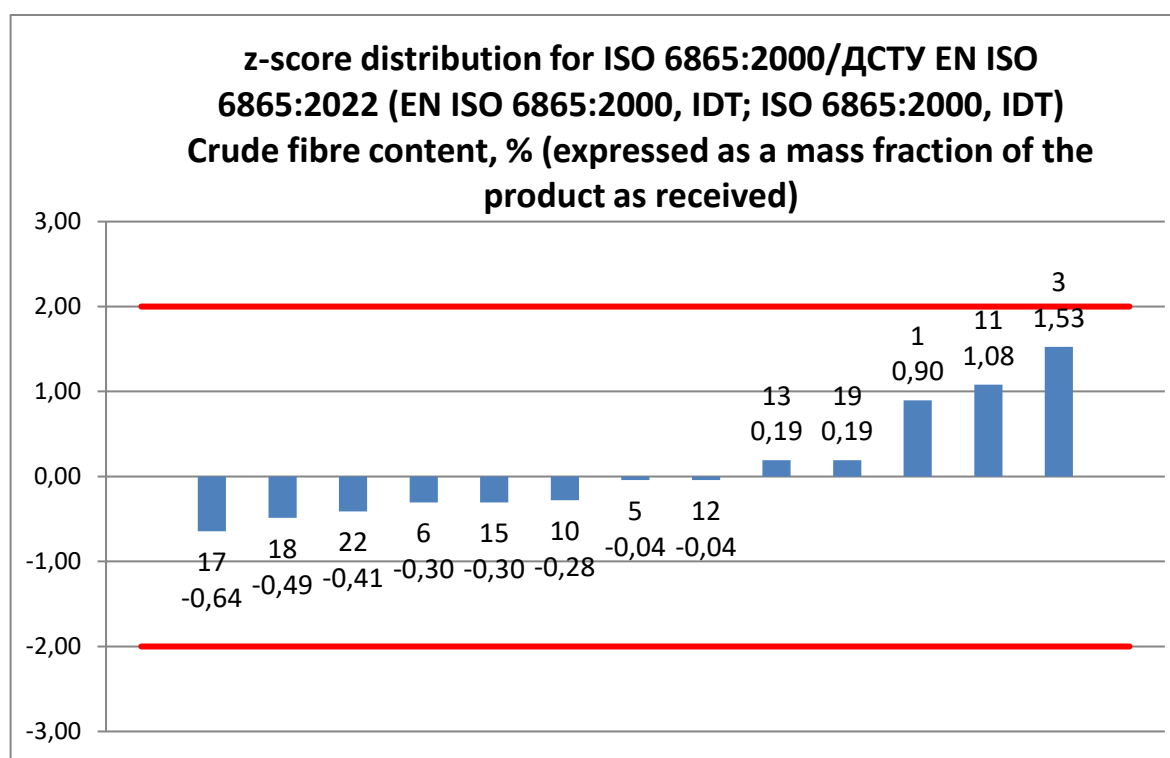
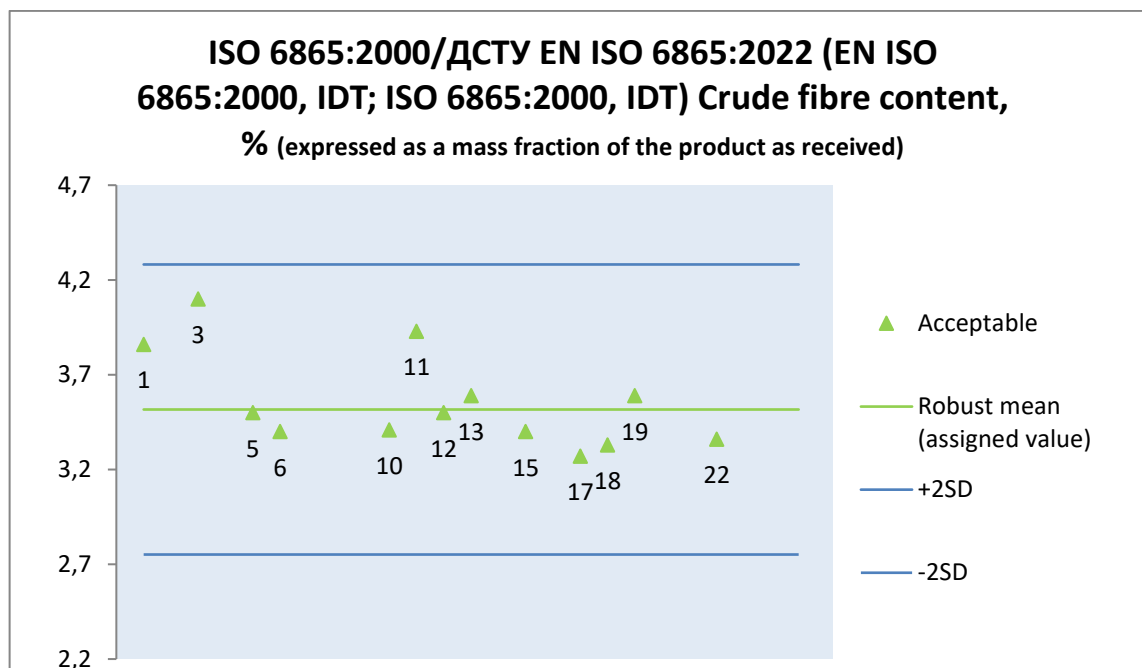
8.1.5. ISO 5985:2002/ ДСТУ ISO 5985:2004 Ash insoluble in hydrochloric acid, % (expressed as a mass fraction of the product as received)



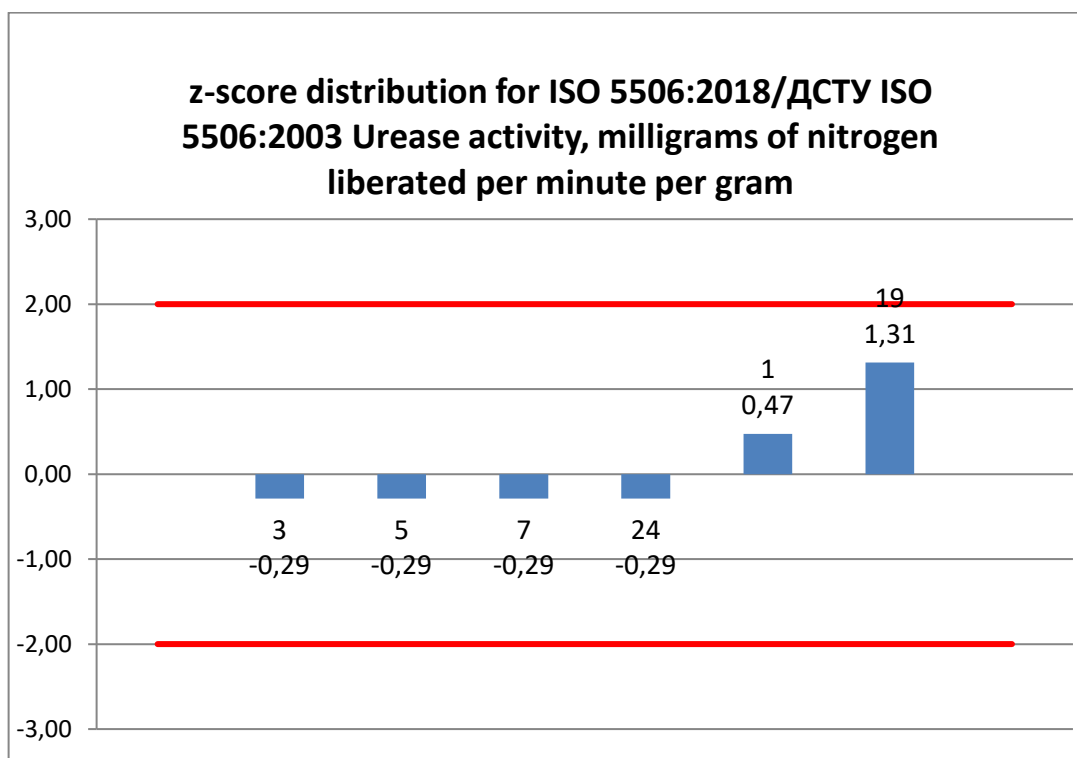
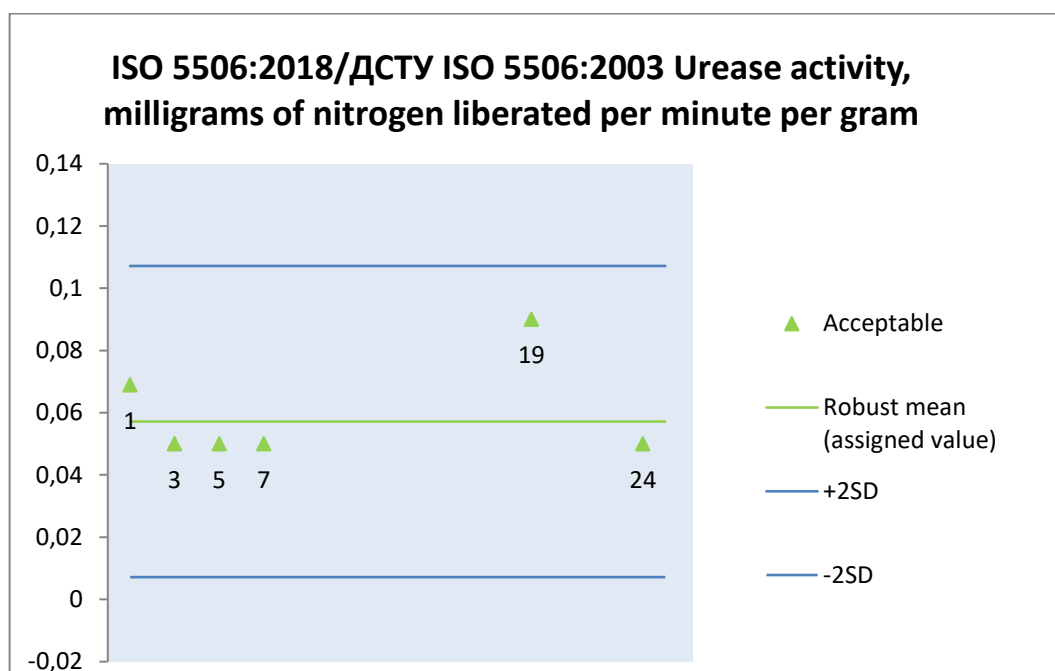
8.1.6. ISO 734:2023/ ДСТУ ISO 734-1:2008 Fat content, % (expressed as a mass fraction of the product as received)



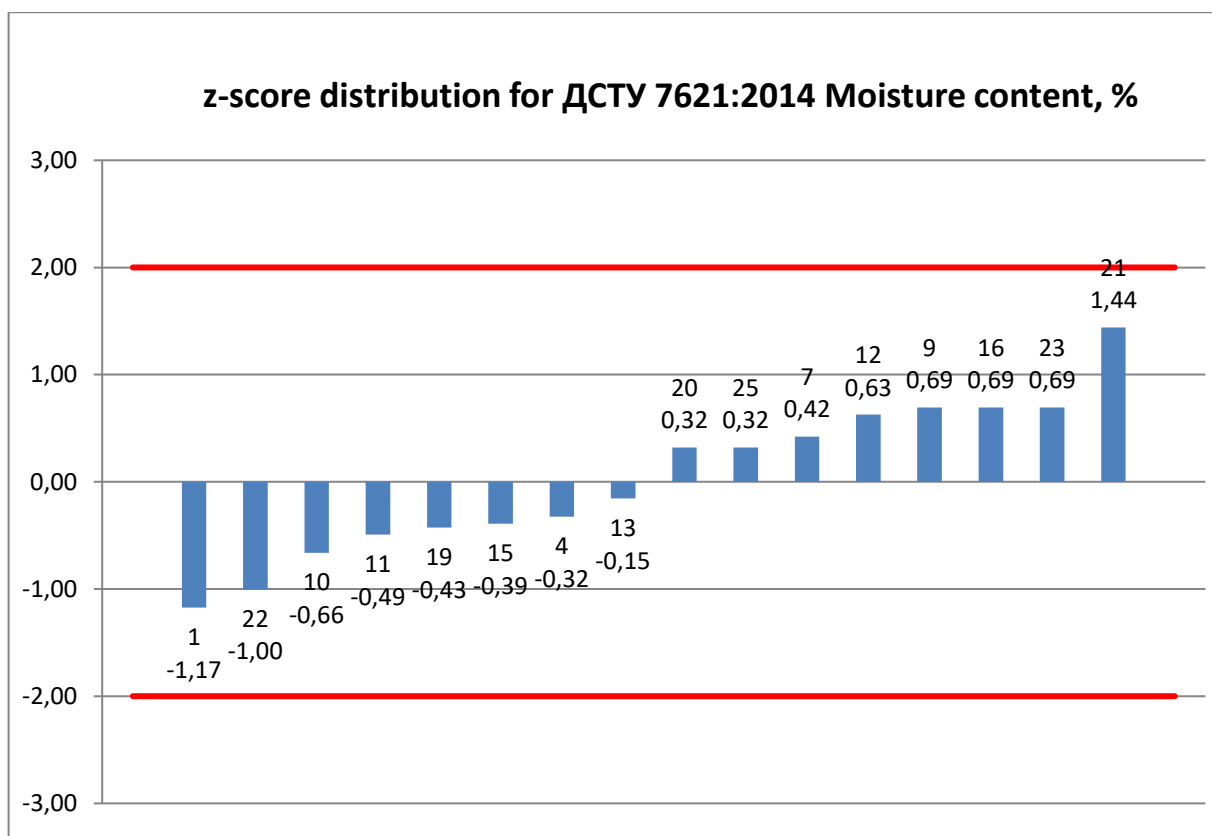
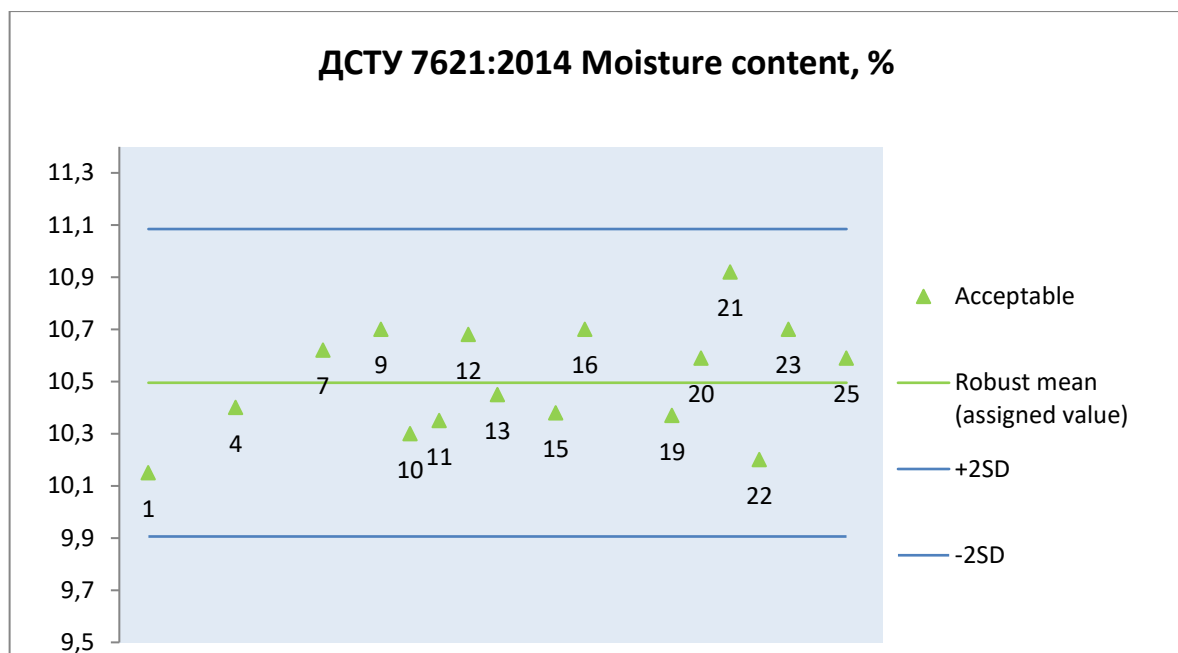
8.1.7. ISO 6865:2000/ДСТУ EN ISO 6865:2022 (EN ISO 6865:2000, IDT; ISO 6865:2000, IDT) Crude fibre content, % (expressed as a mass fraction of the product as received)



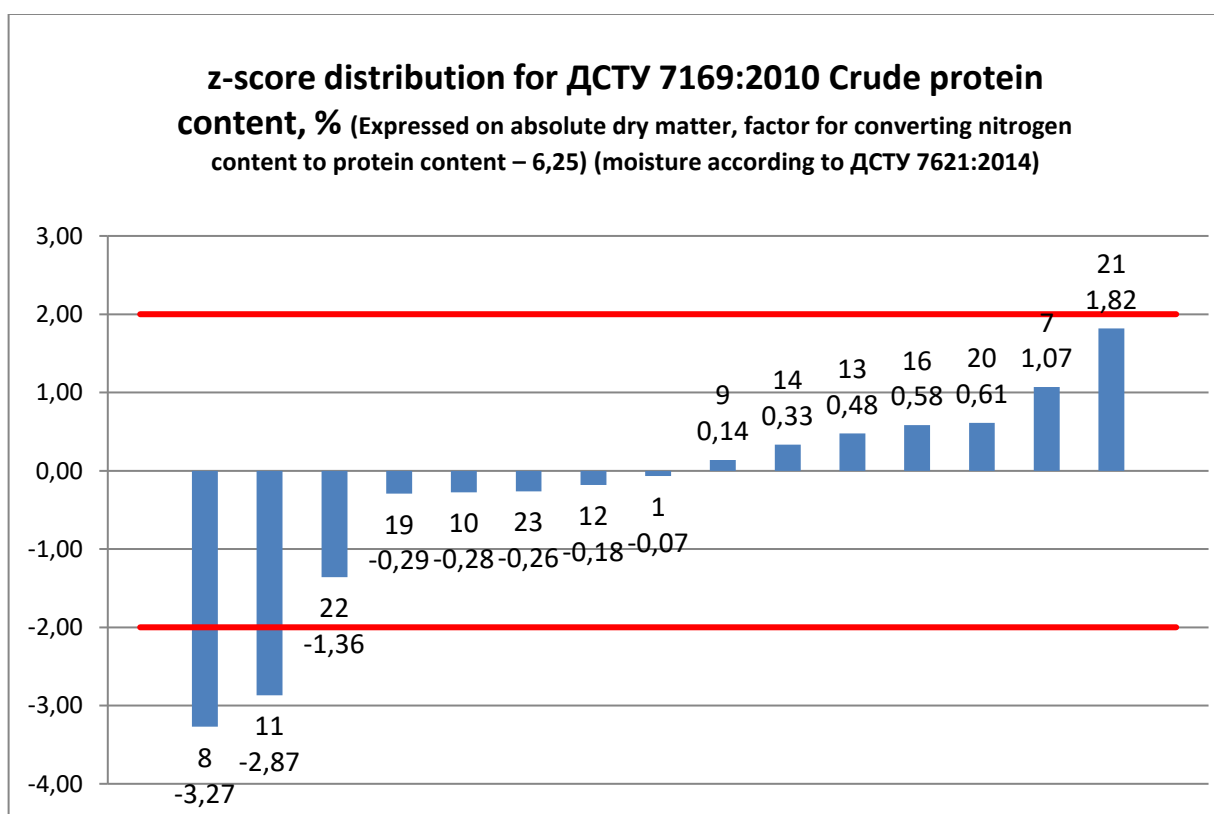
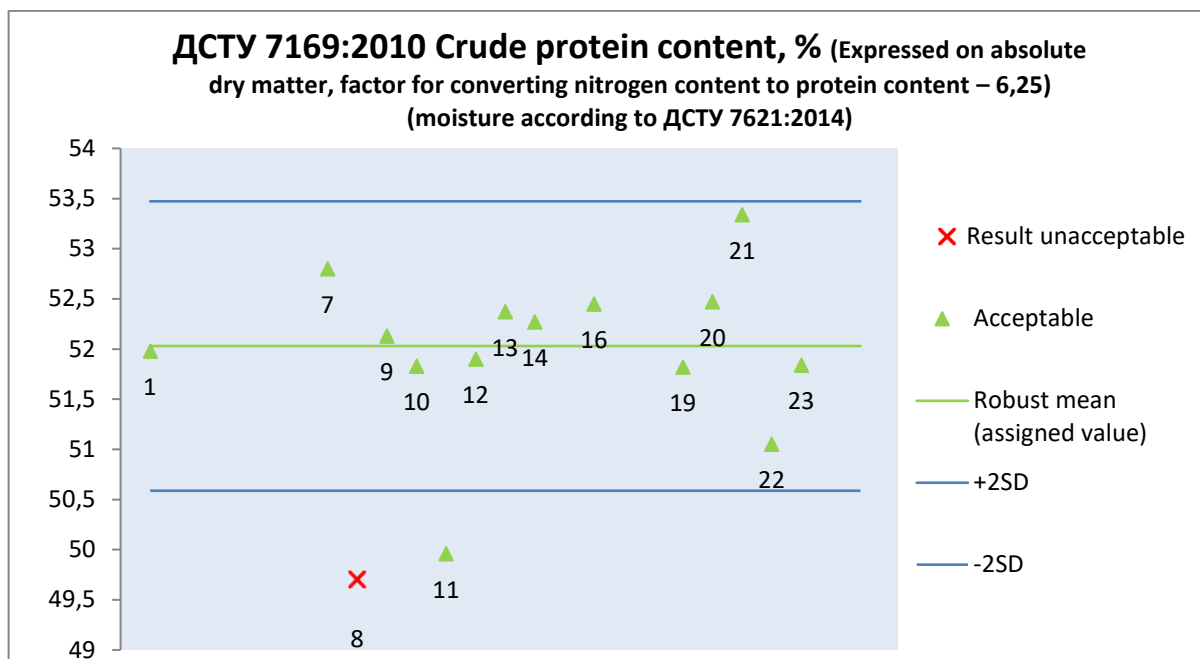
8.1.8. ISO 5506:2018/ДСТУ ISO 5506:2003 Urease activity, milligrams of nitrogen liberated per minute per gram



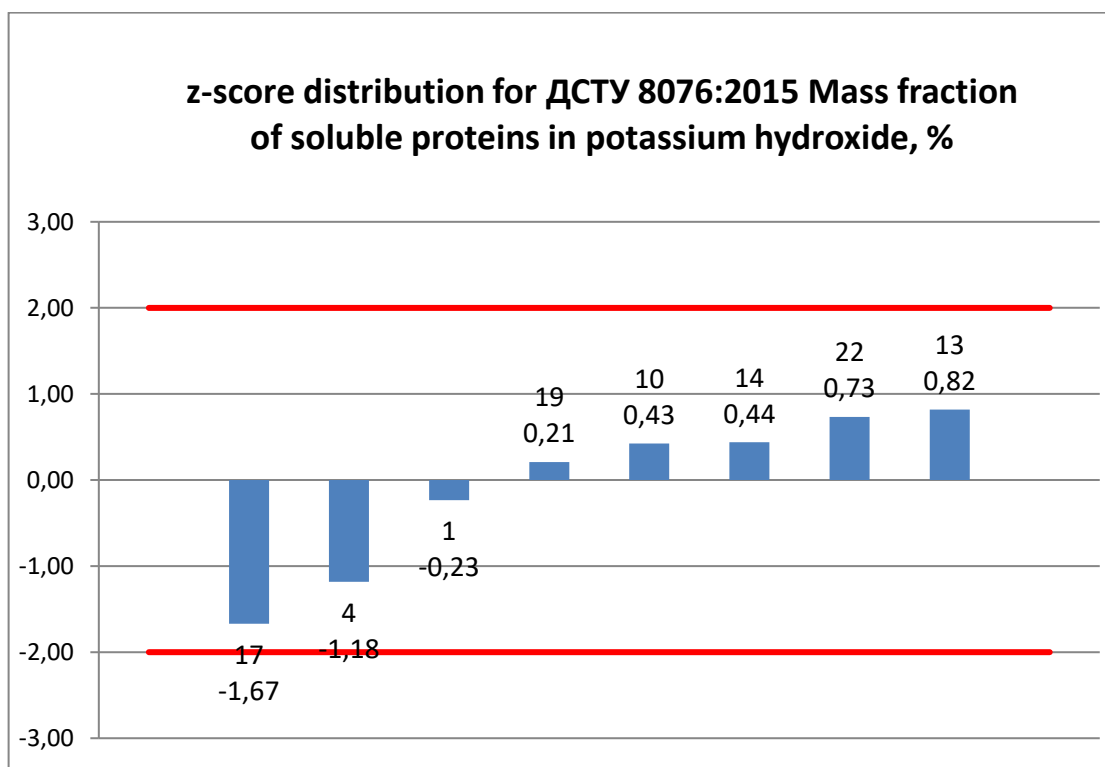
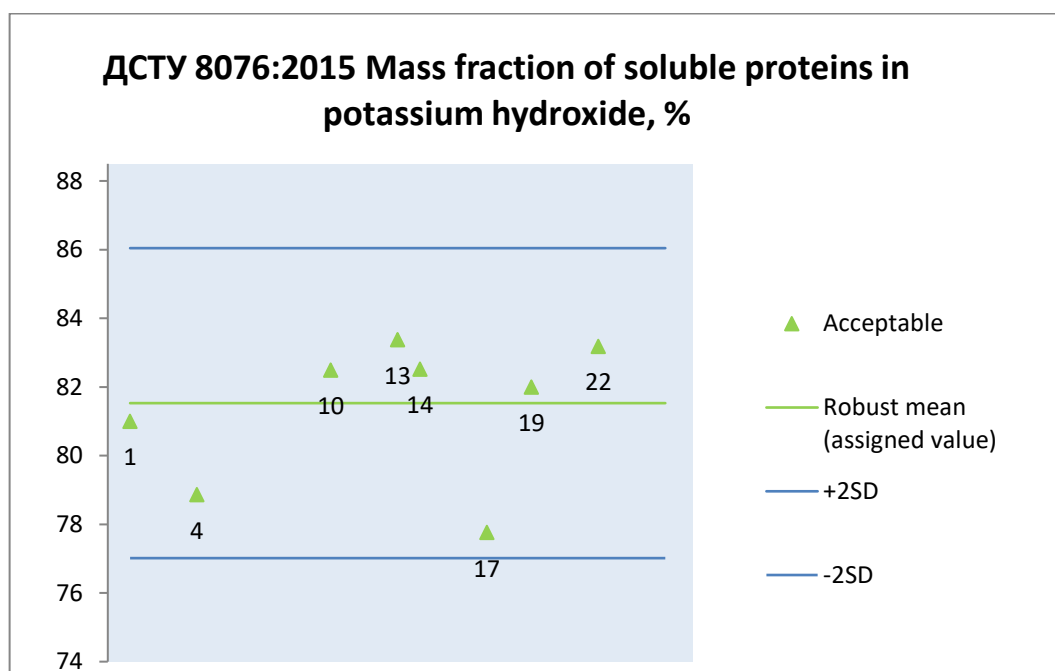
8.1.9. ДСТУ 7621:2014 Moisture content, %



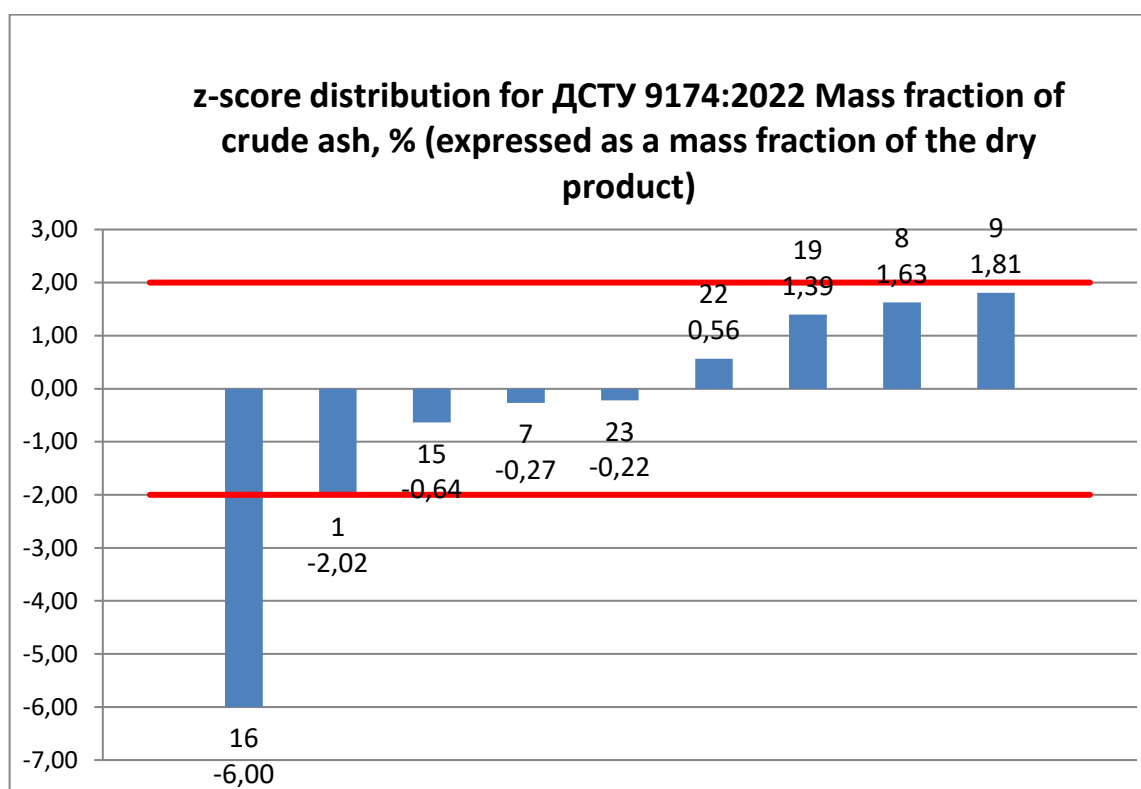
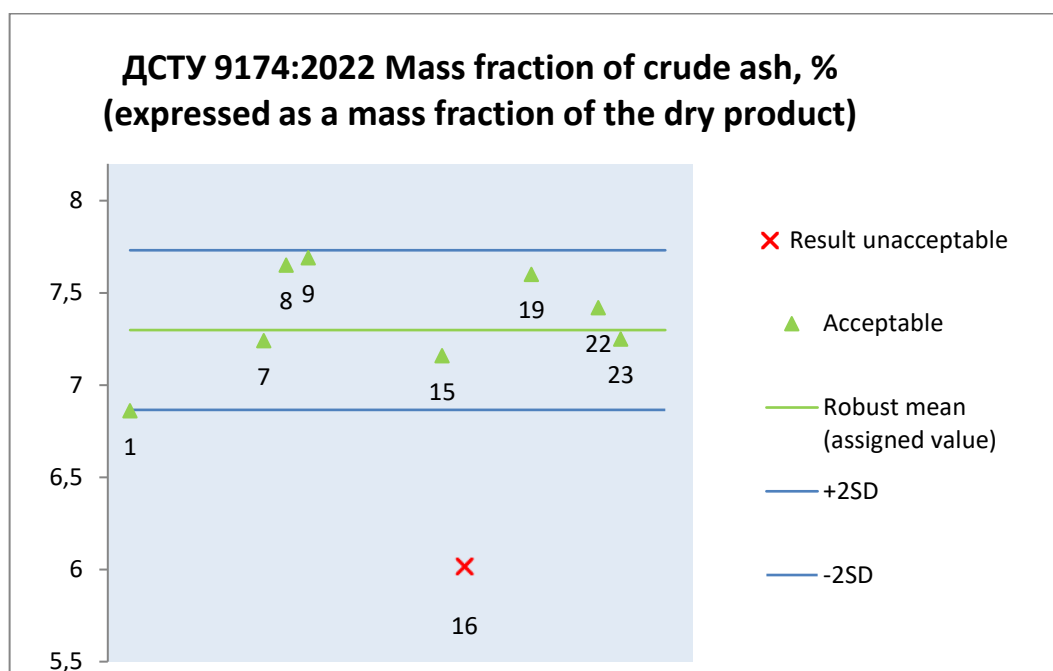
8.1.10. ДСТУ 7169:2010 Crude protein content, % (Expressed on absolute dry matter, factor for converting nitrogen content to protein content – 6,25) (moisture according to ДСТУ 7621:2014)



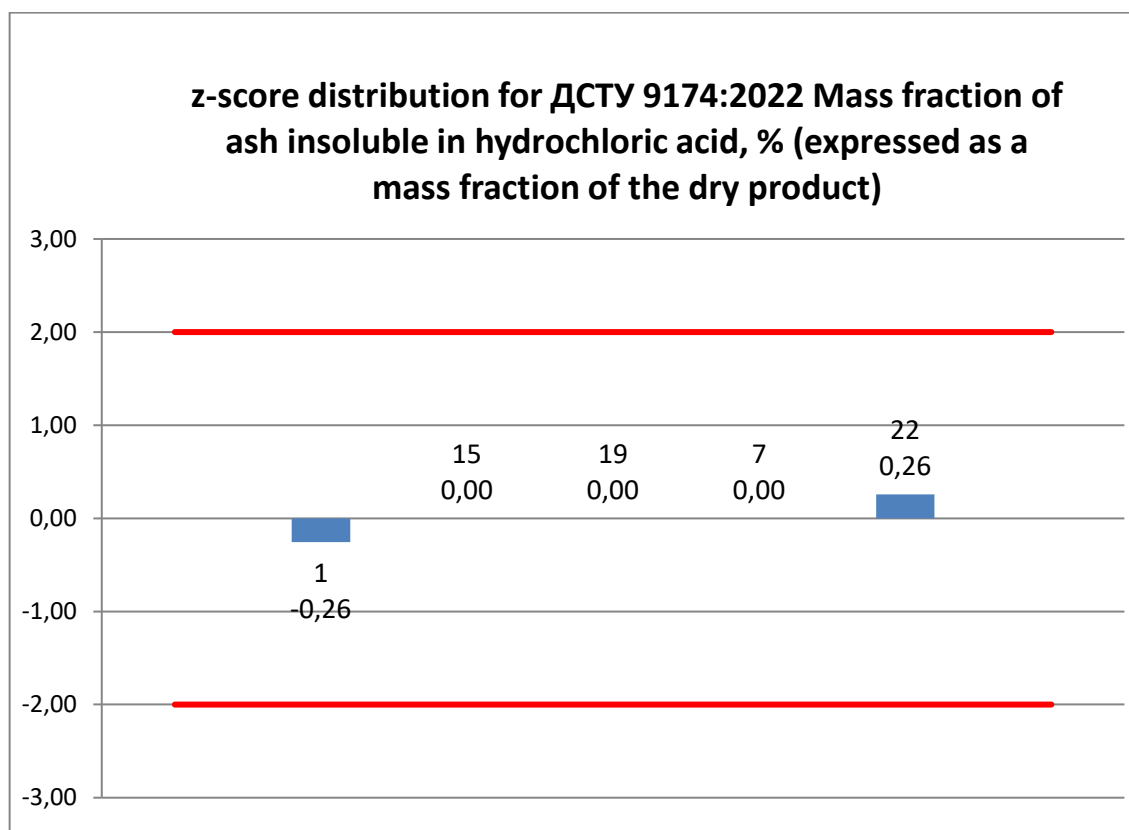
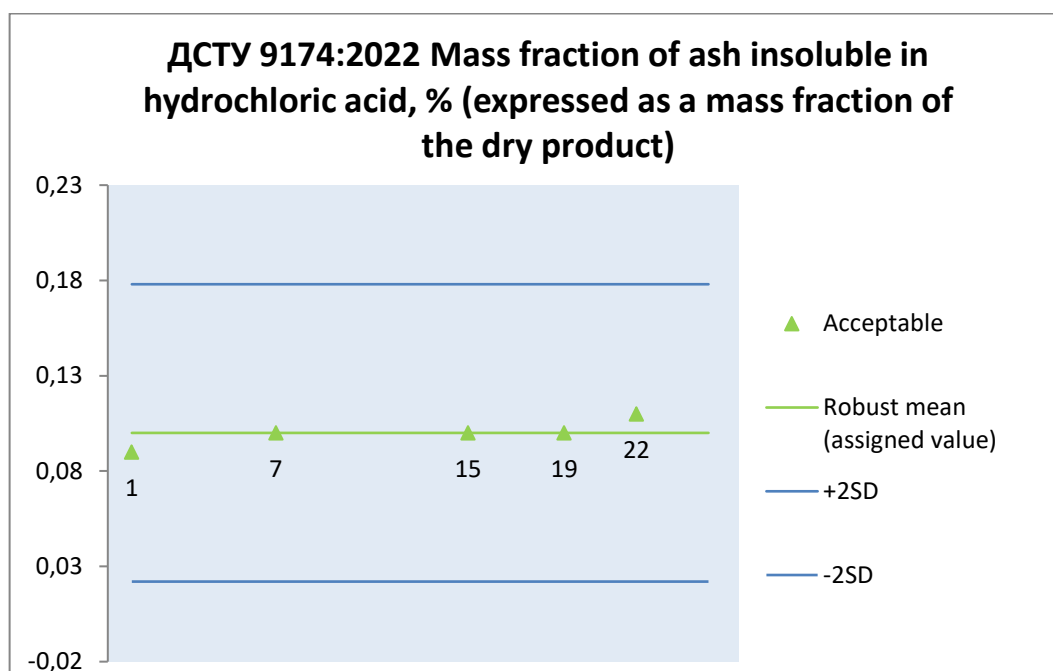
8.1.11. ДСТУ 8076:2015 Mass fraction of soluble proteins in potassium hydroxide, %



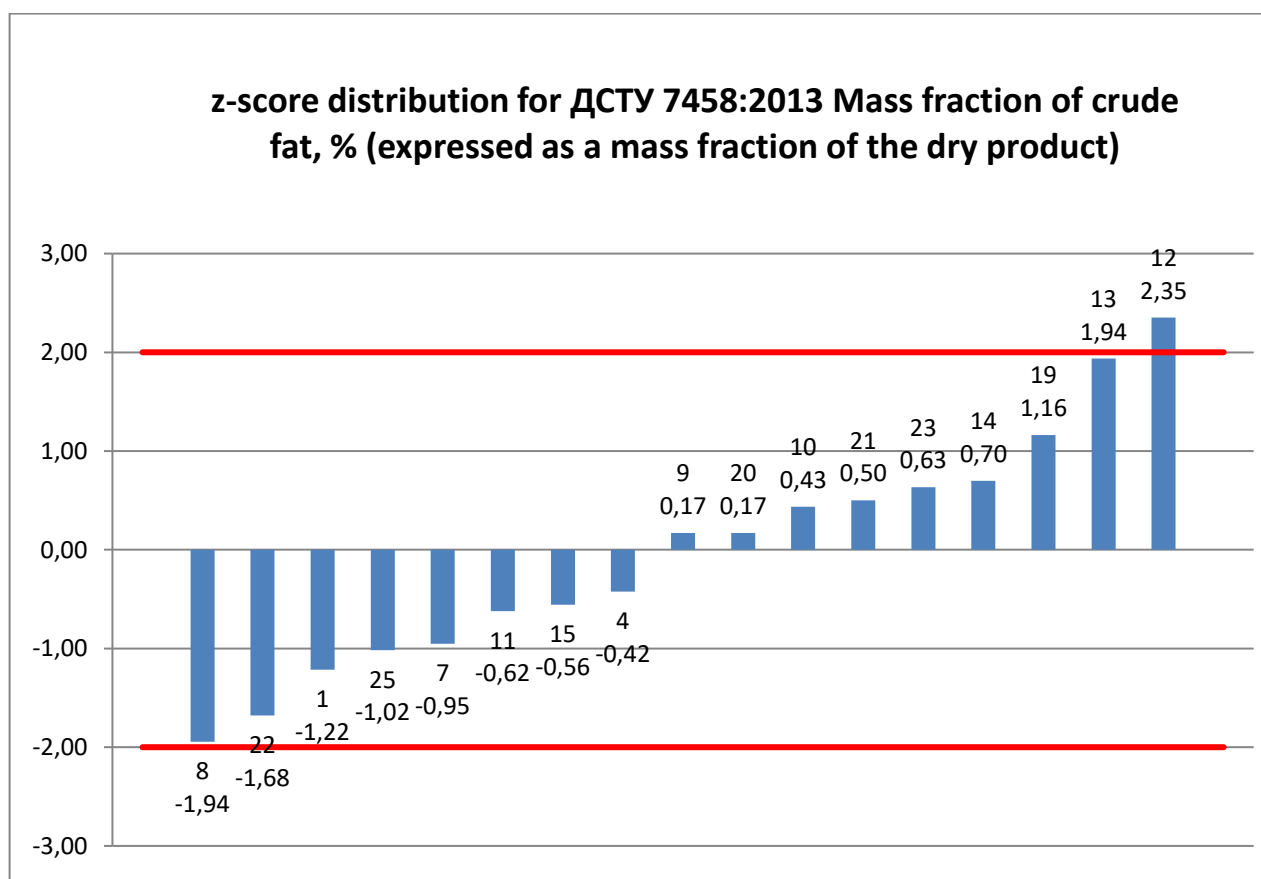
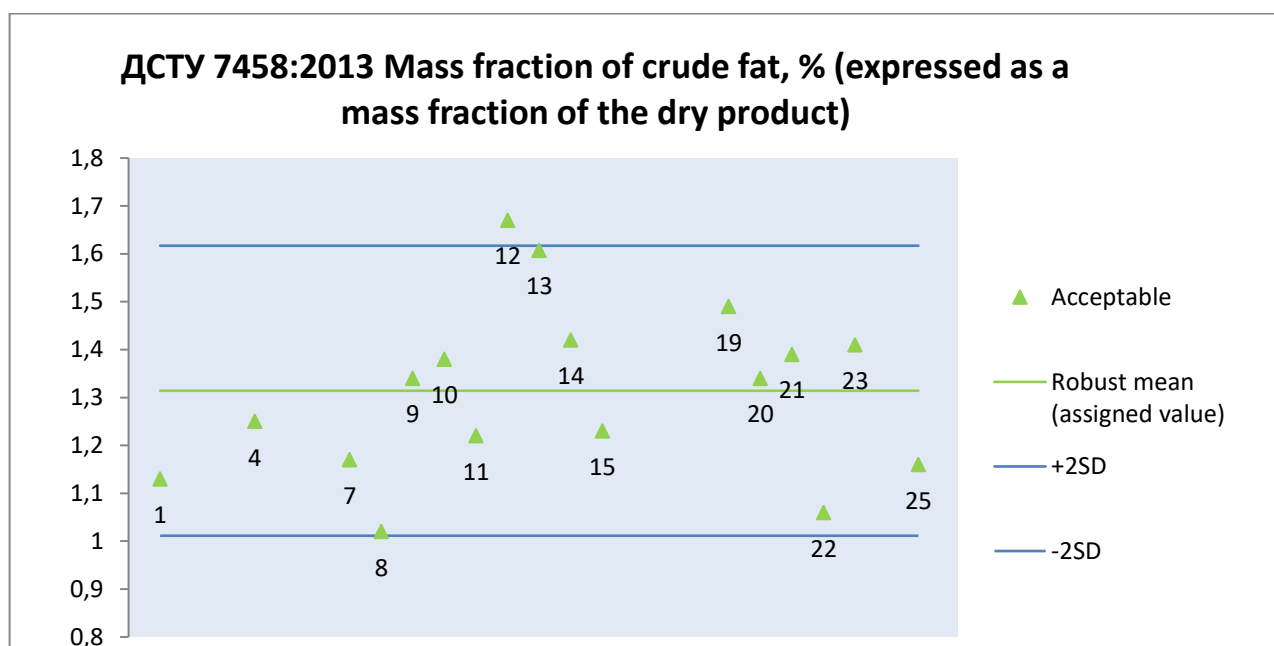
8.1.12. DCTY 9174:2022 Mass fraction of crude ash, % (expressed as a mass fraction of the dry product)



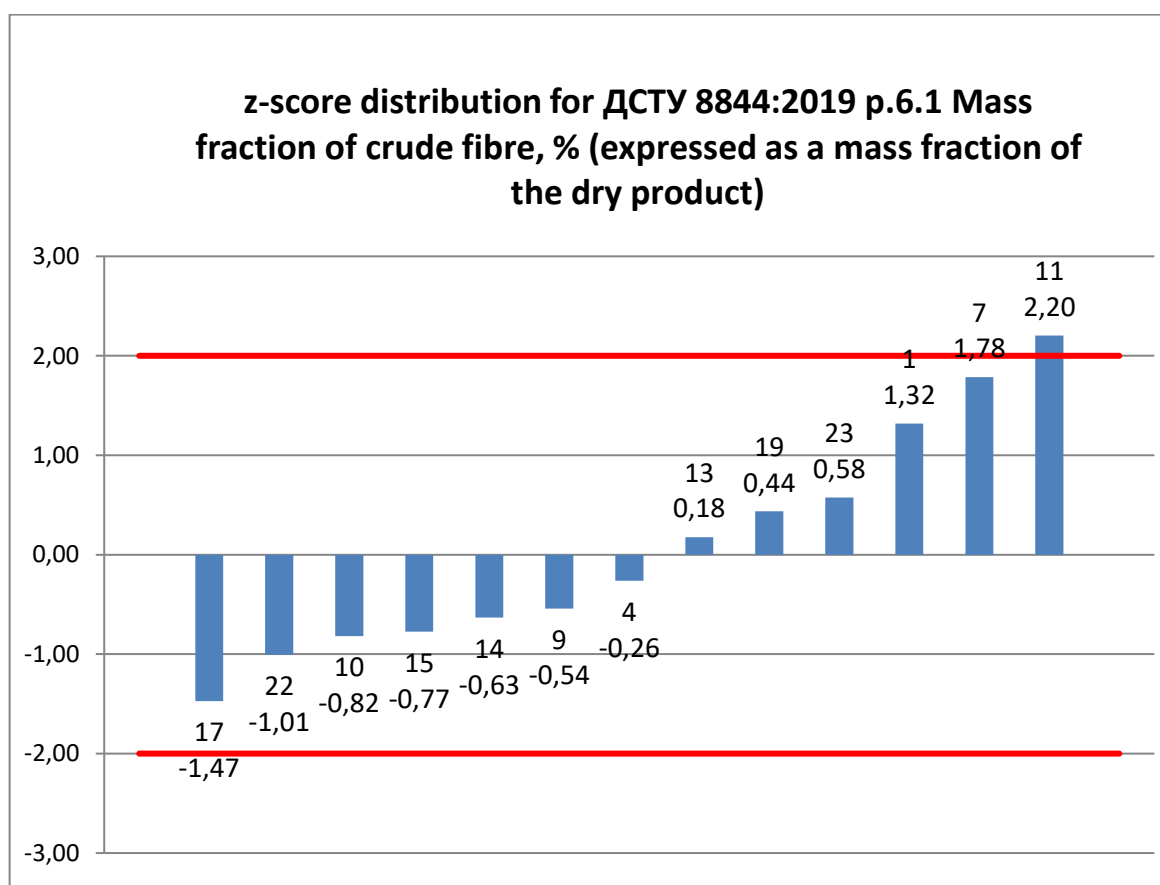
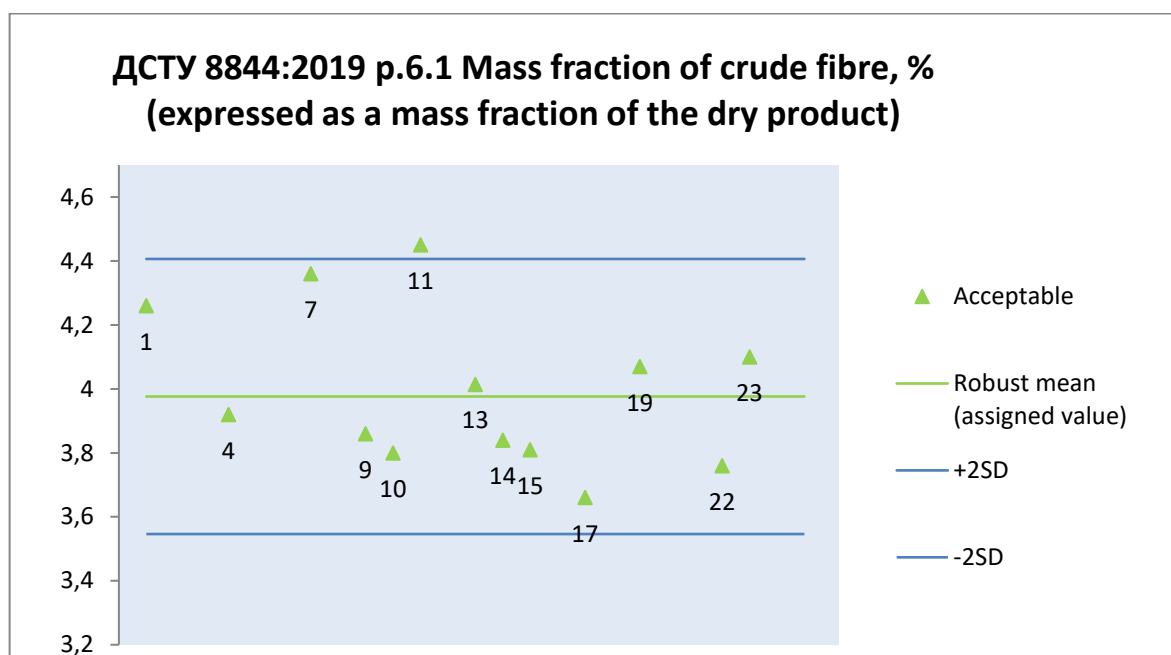
**8.1.13. ДСТУ 9174:2022 Mass fraction of ash insoluble in hydrochloric acid, %
(expressed as a mass fraction of the dry product)**



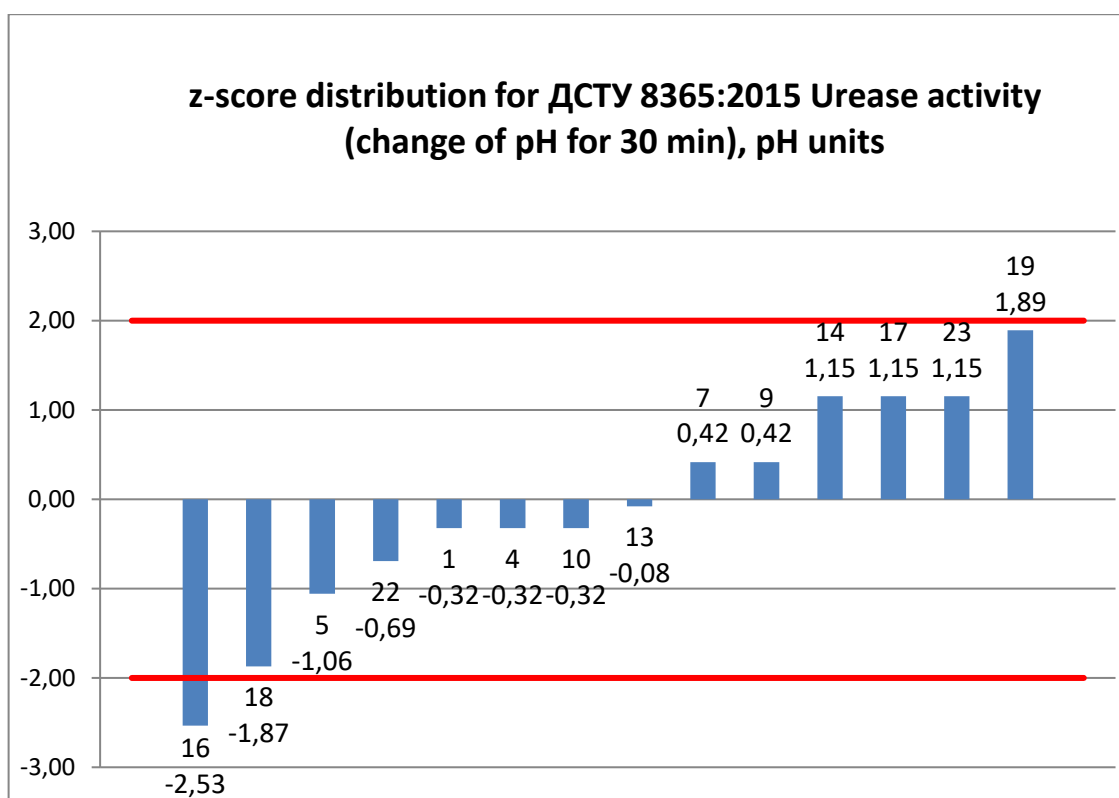
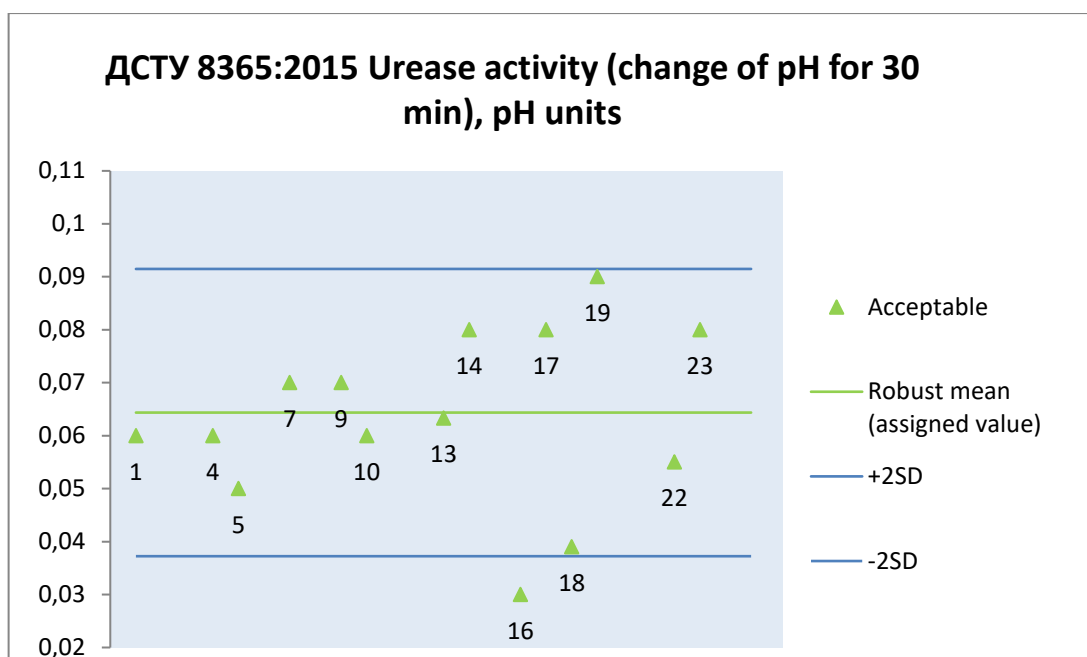
8.1.14. ДСТУ 7458:2013 Mass fraction of crude fat, % (expressed as a mass fraction of the dry product)



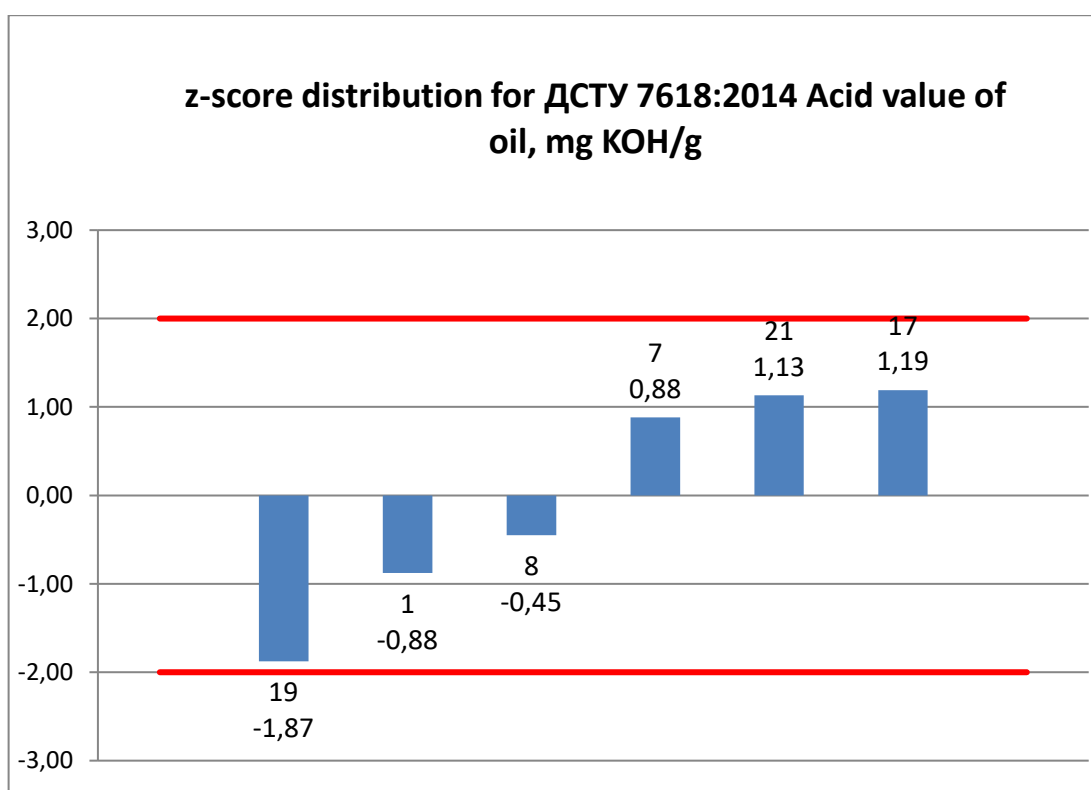
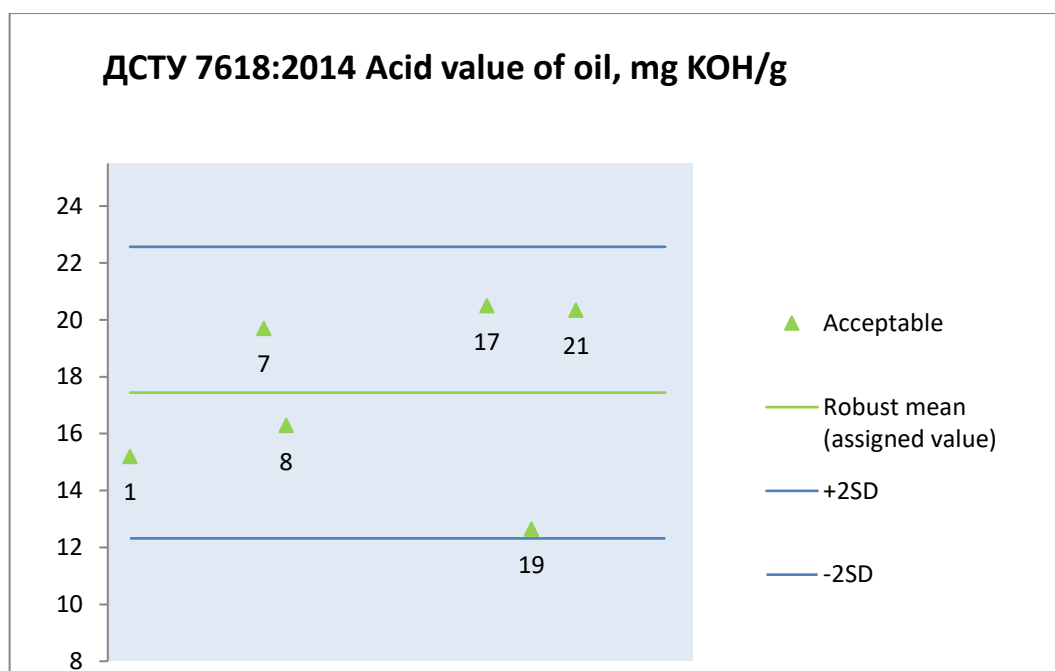
8.1.15. ДСТУ 8844:2019 p.6.1 Mass fraction of crude fibre, % (expressed as a mass fraction of the dry product)



8.1.16. ДСТУ 8365:2015 Urease activity (change of pH for 30 min), pH units

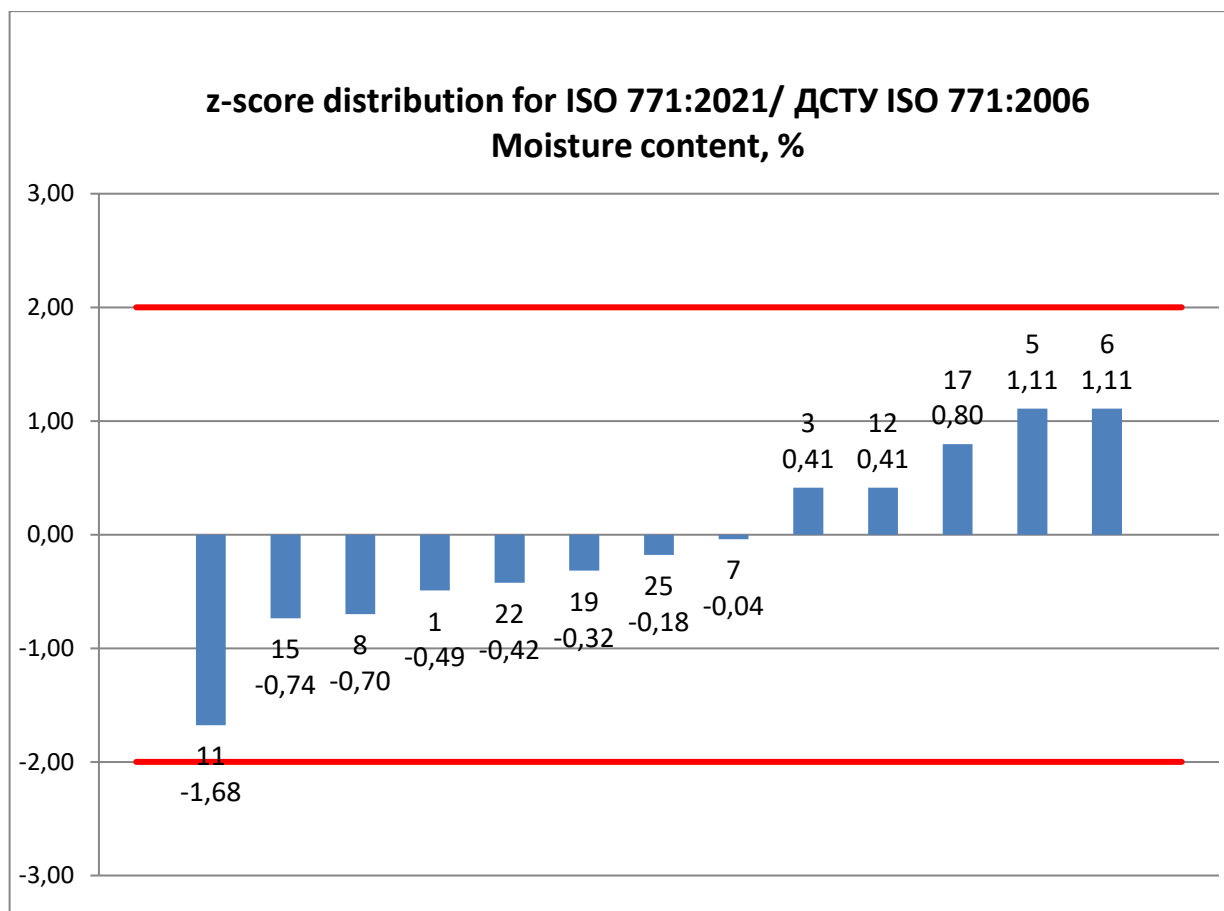
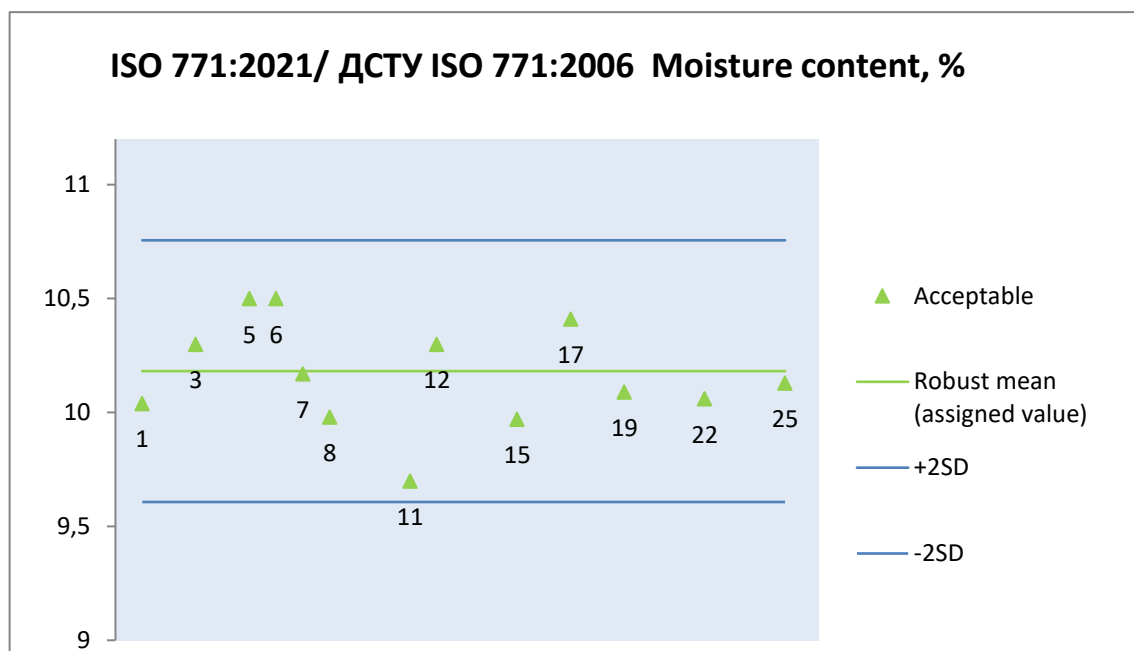


8.1.17. ДСТУ 7618:2014 Acid value of oil, mg KOH/g

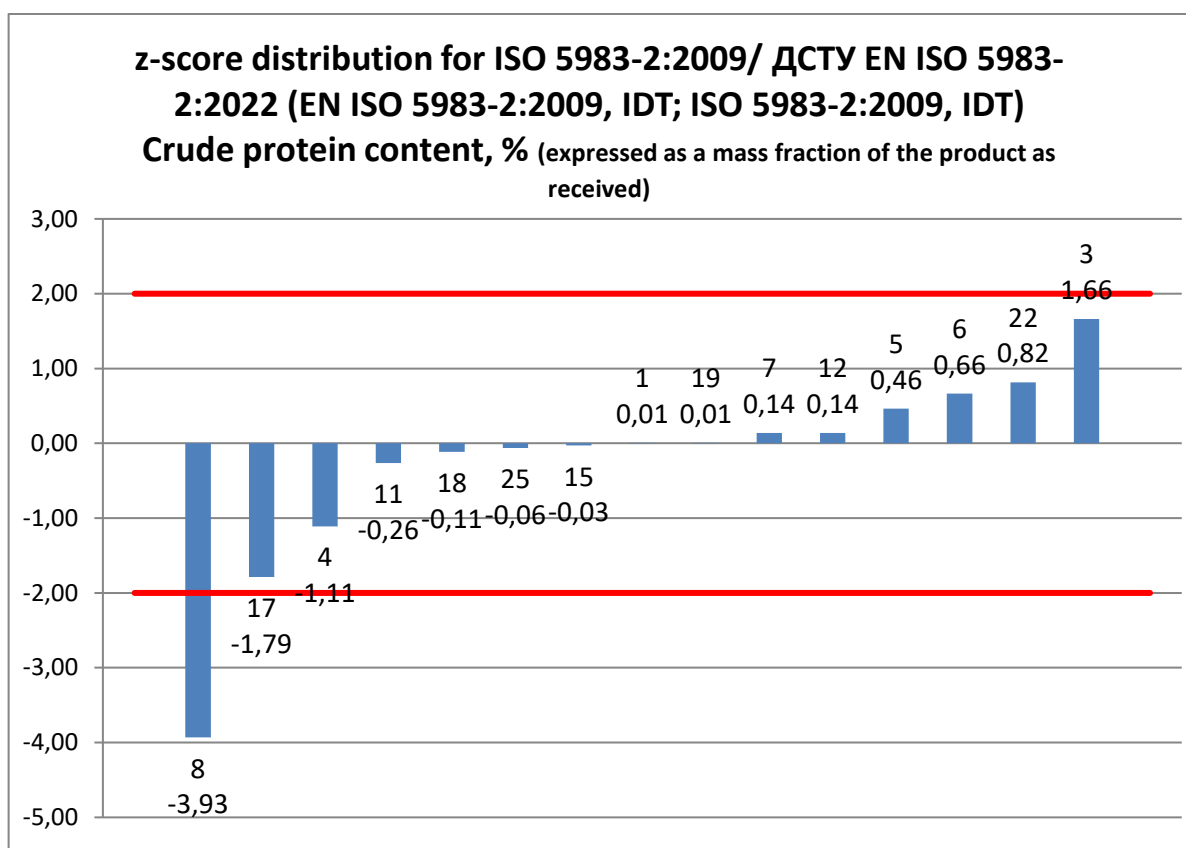
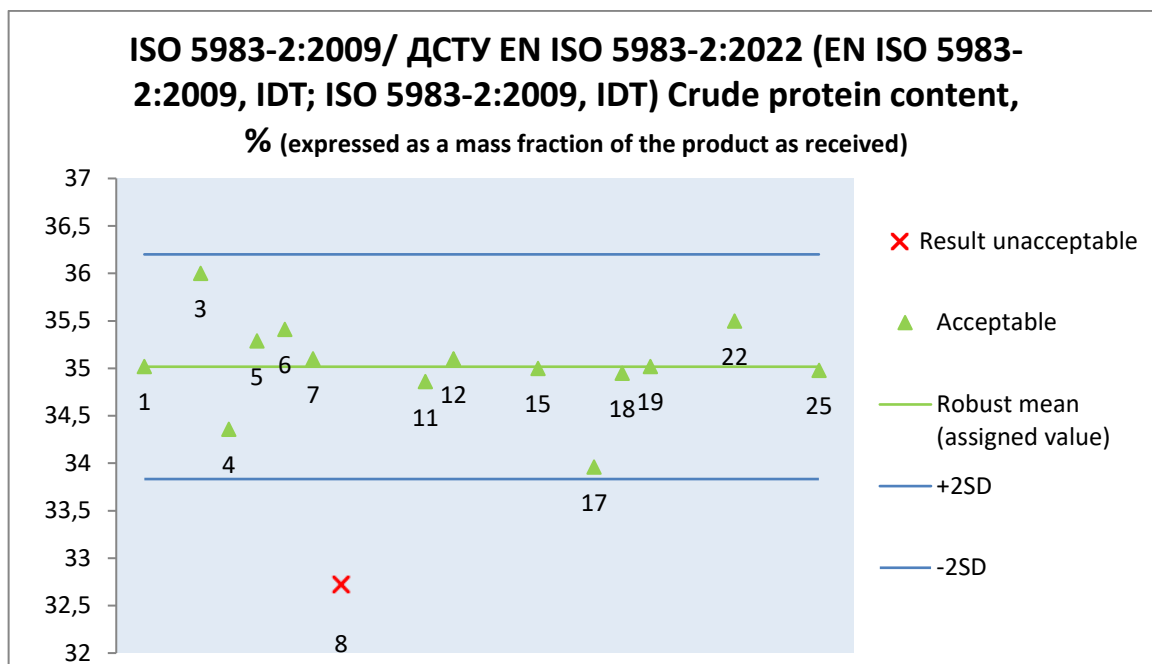


8.2. Sample B (Rapeseed meal)

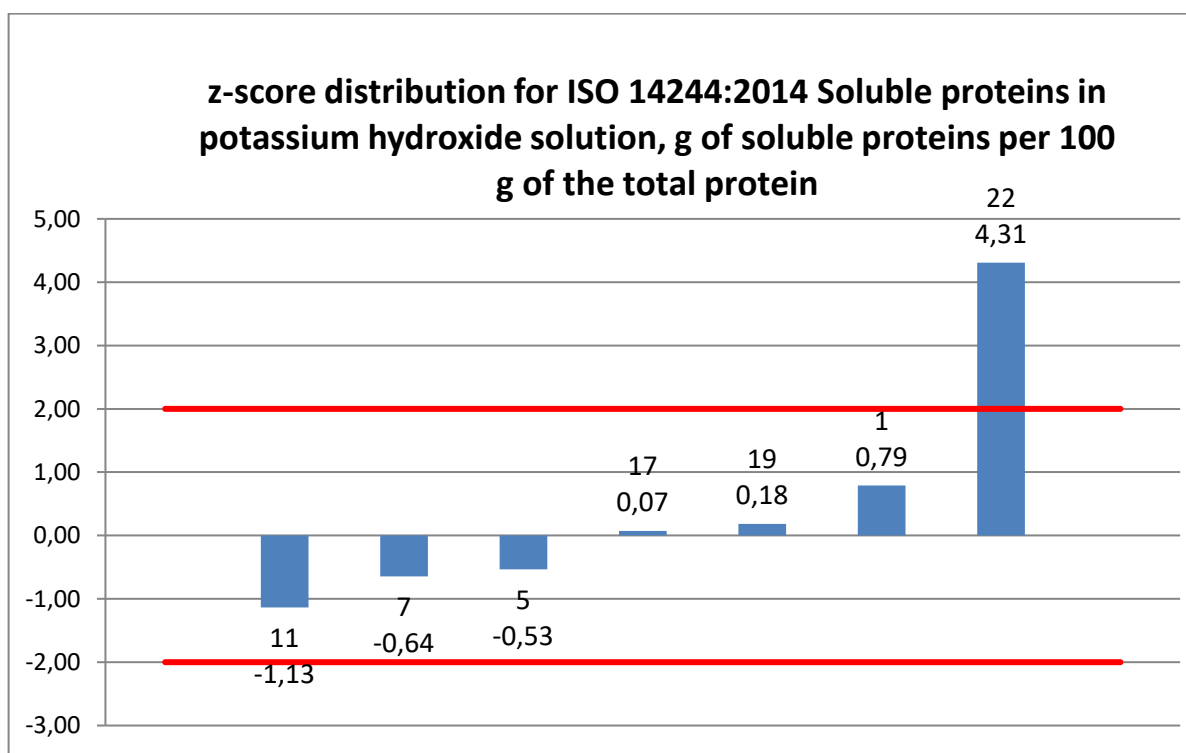
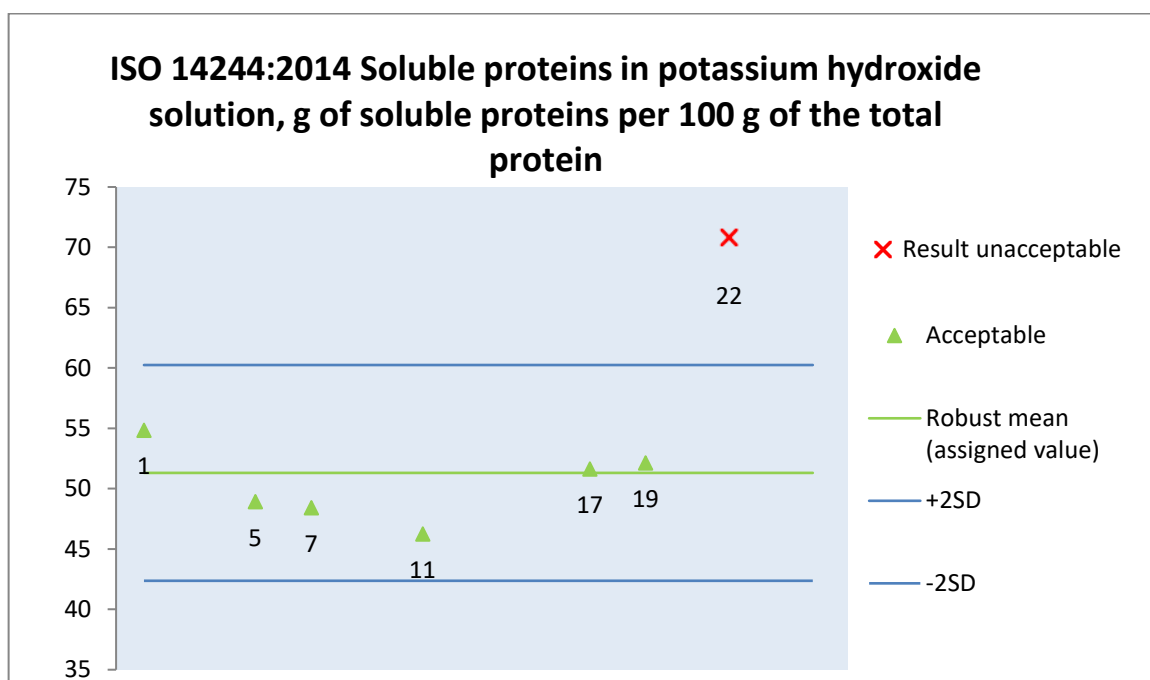
8.2.1. ISO 771:2021/ ДСТУ ISO 771:2006 Moisture content, %



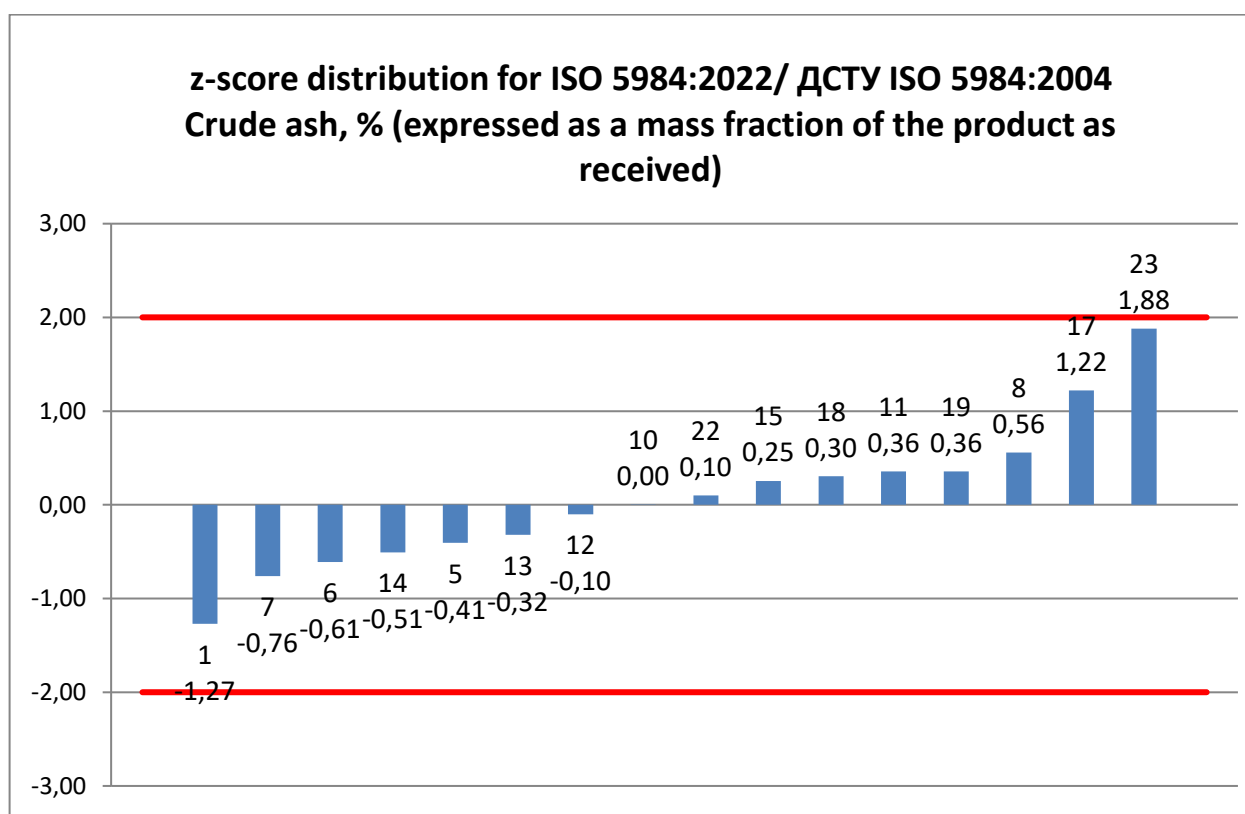
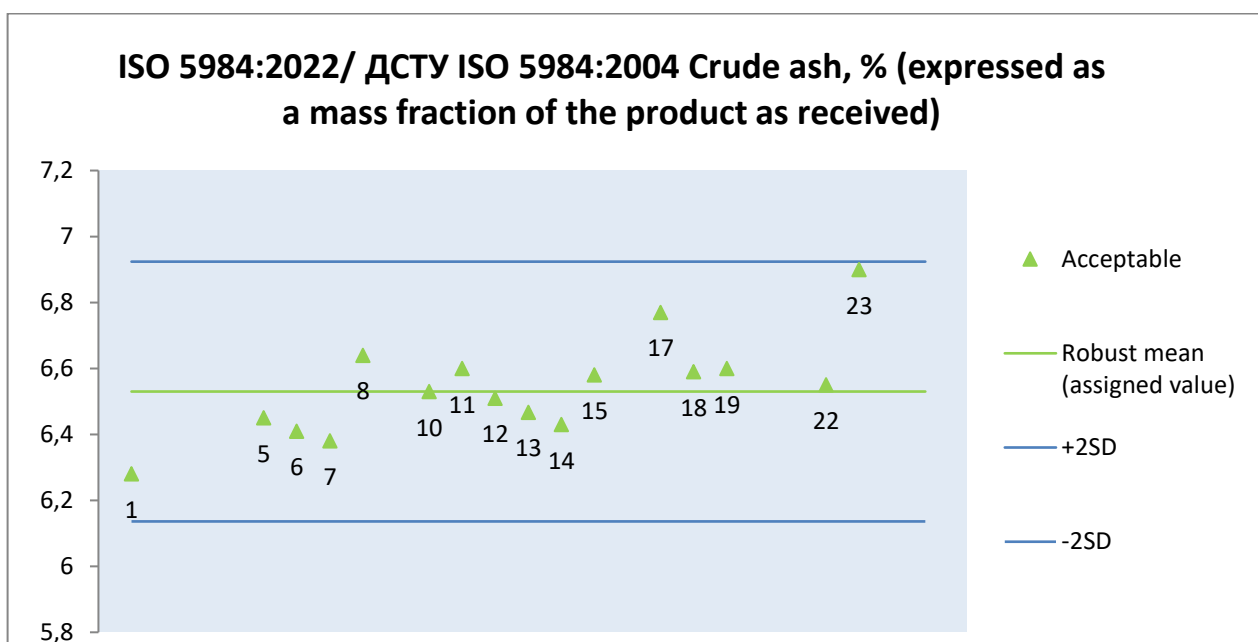
8.2.2. ISO 5983-2:2009/ ДСТУ EN ISO 5983-2:2022 (EN ISO 5983-2:2009, IDT; ISO 5983-2:2009, IDT) Crude protein content, % (expressed as a mass fraction of the product as received)



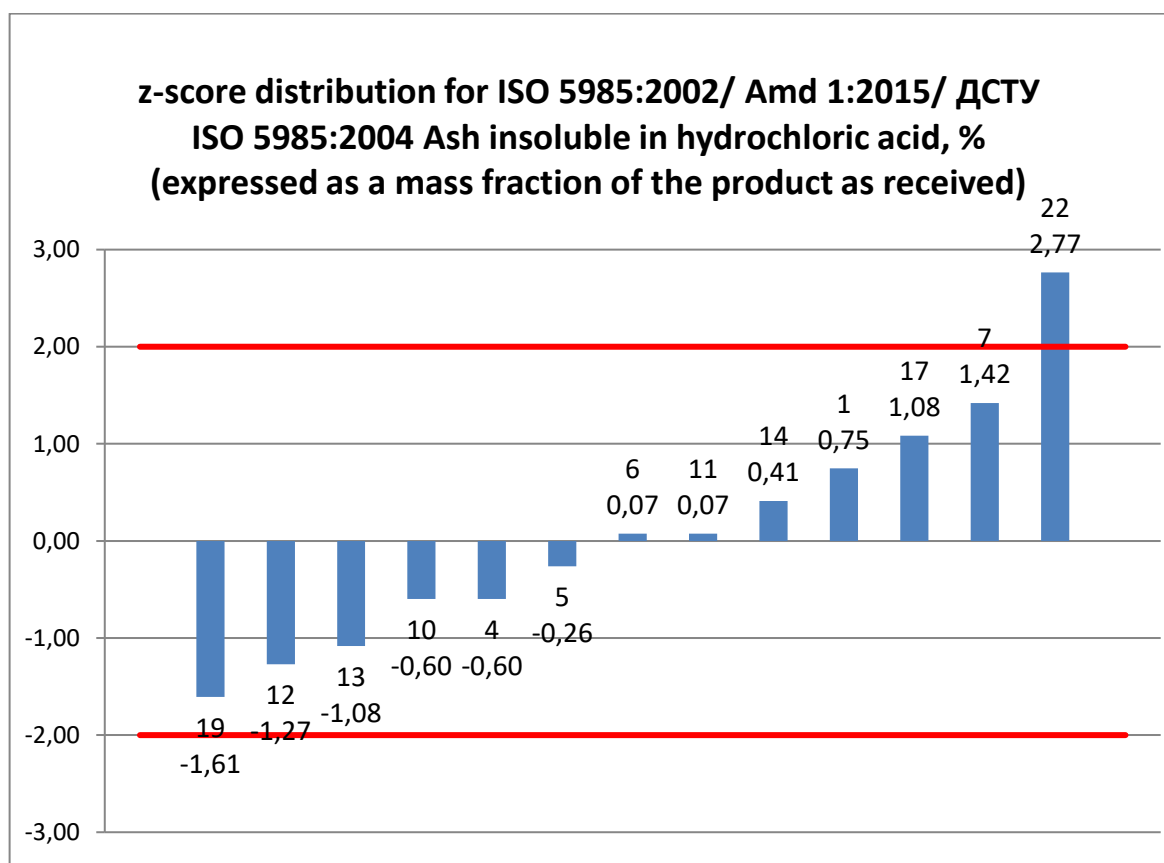
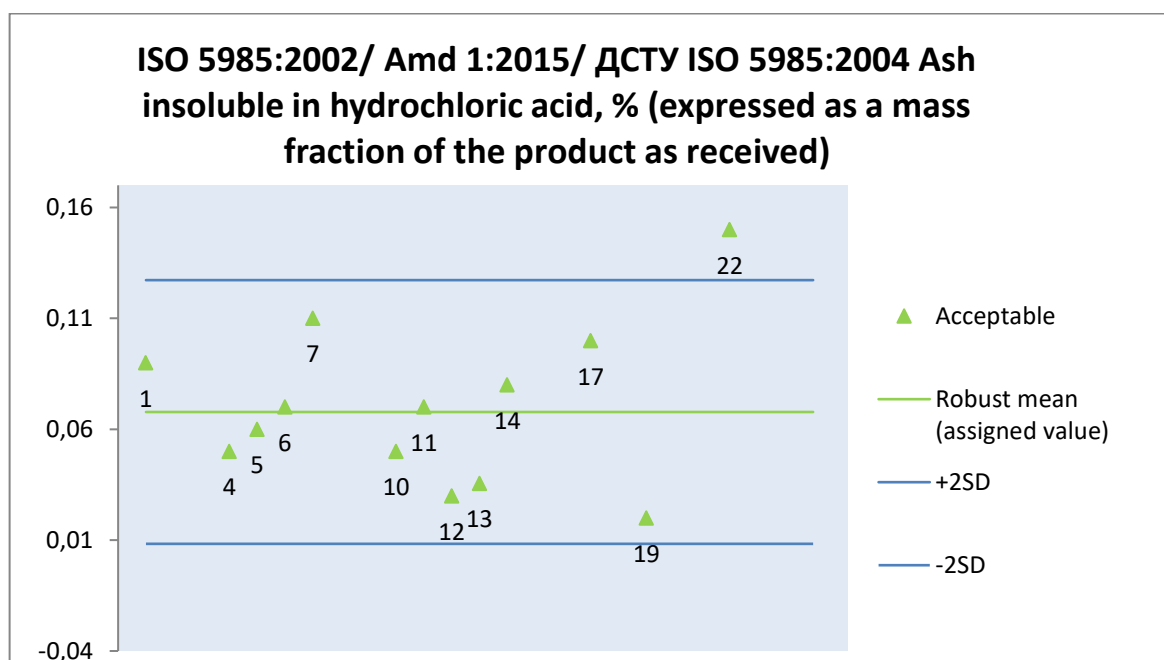
8.2.3. ISO 14244:2014 Soluble proteins in potassium hydroxide solution, g of soluble proteins per 100 g of the total protein



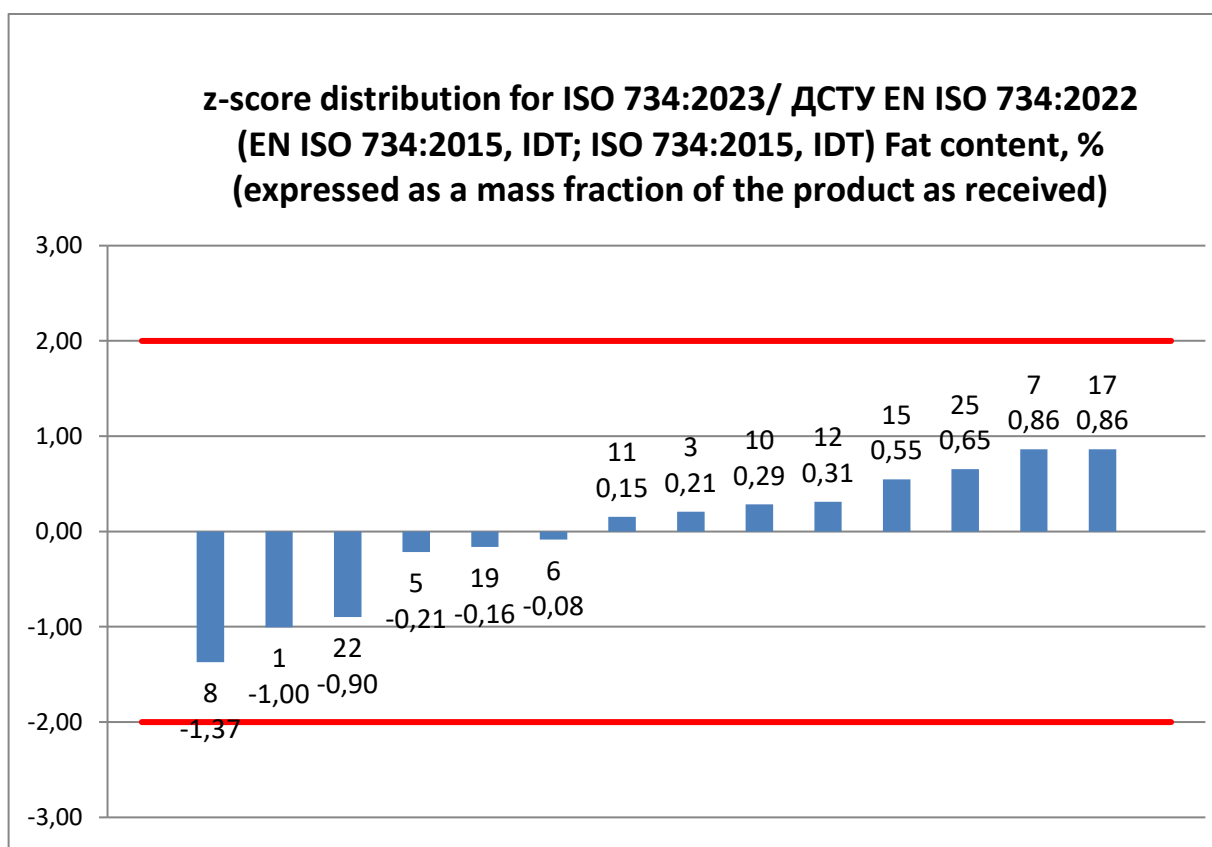
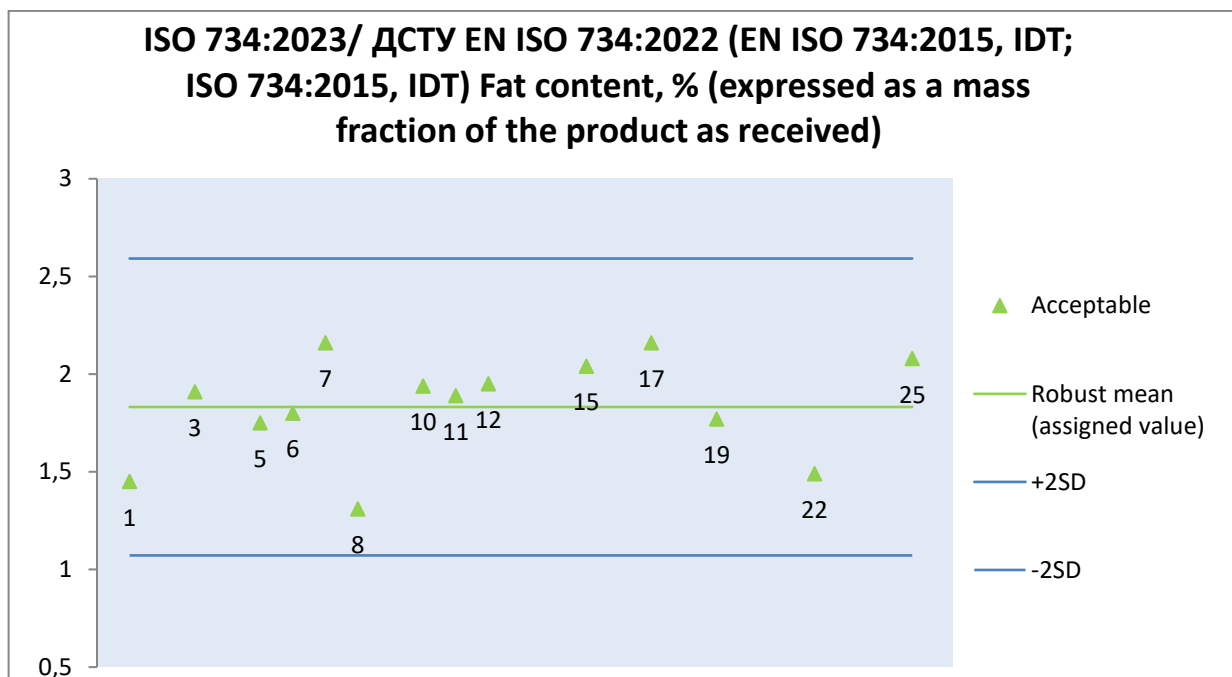
8.2.4. ISO 5984:2022/ ДСТУ ISO 5984:2004 Crude ash, % (expressed as a mass fraction of the product as received)



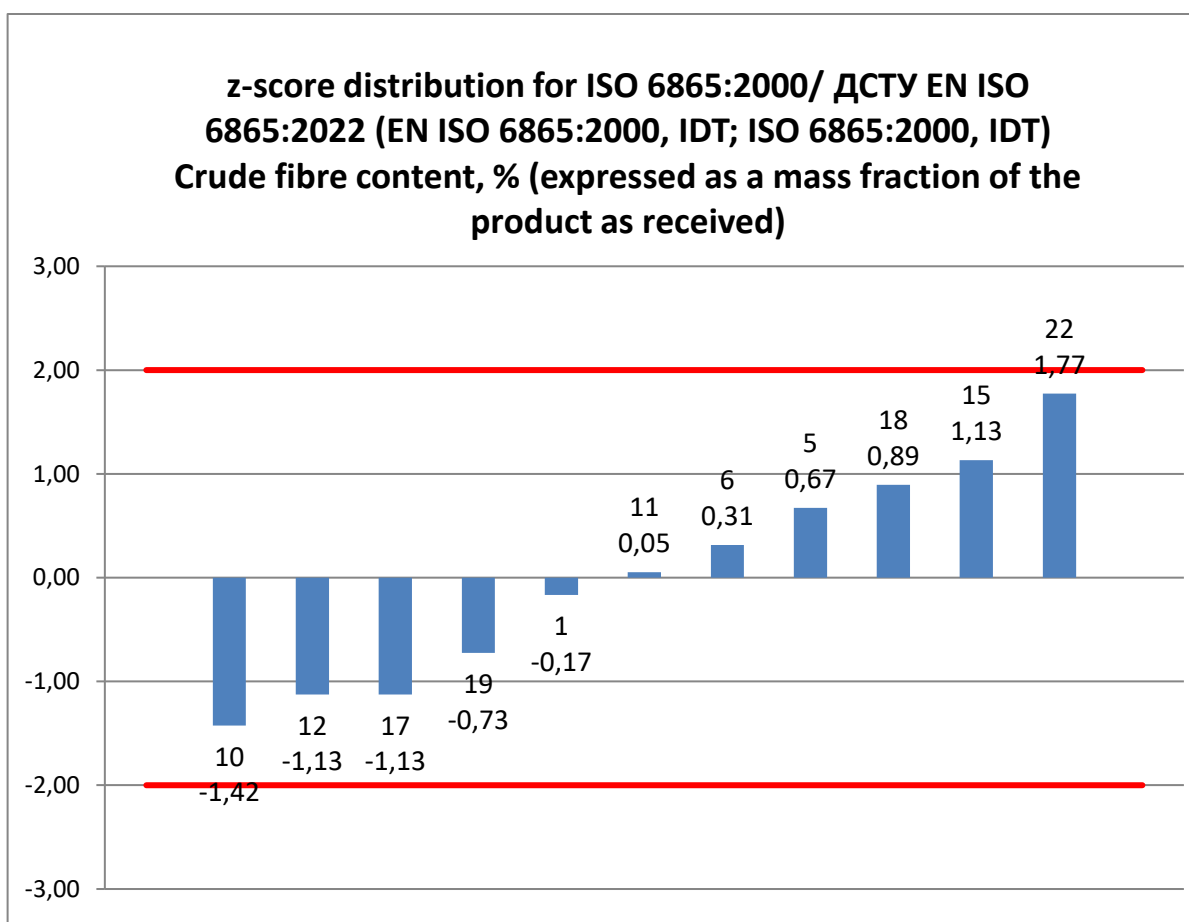
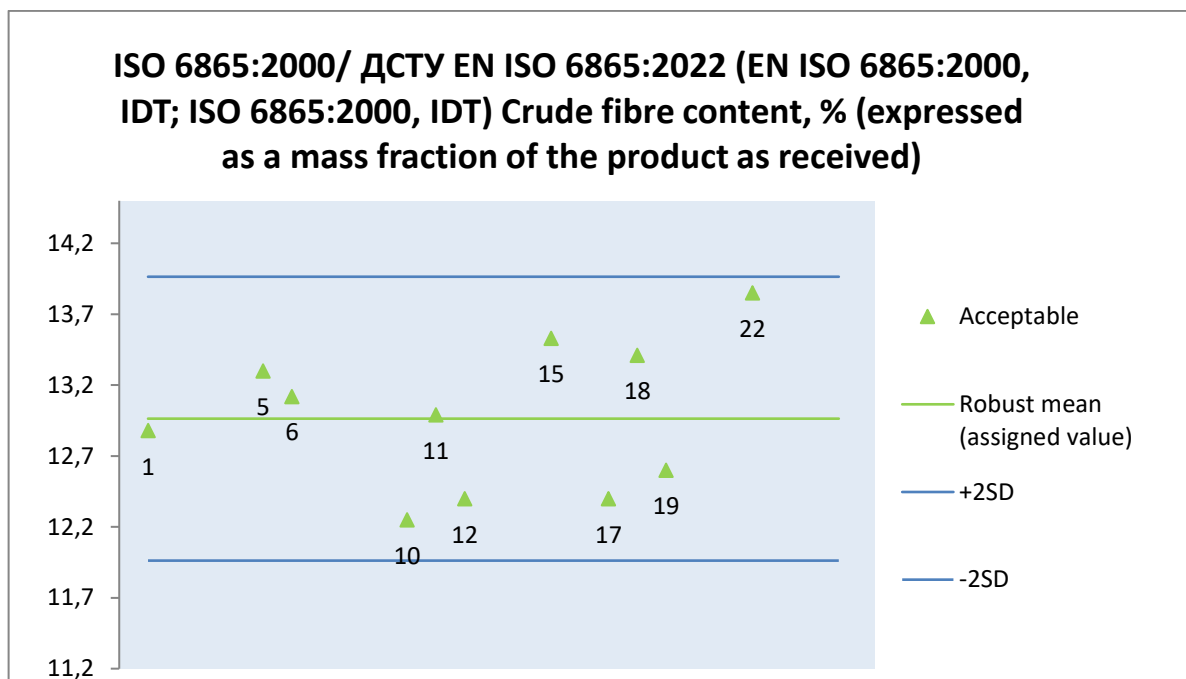
8.2.5. ISO 5985:2002/ Amd 1:2015/ ДСТУ ISO 5985:2004 Ash insoluble in hydrochloric acid, % (expressed as a mass fraction of the product as received)



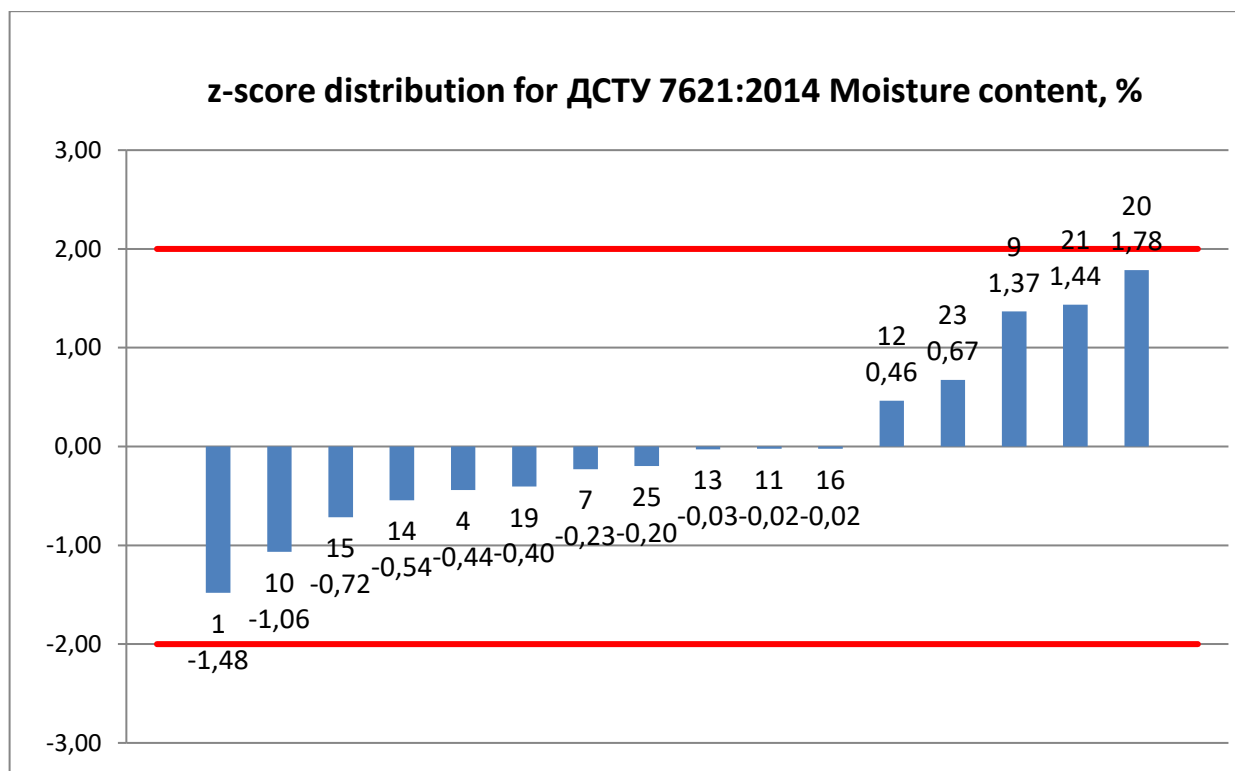
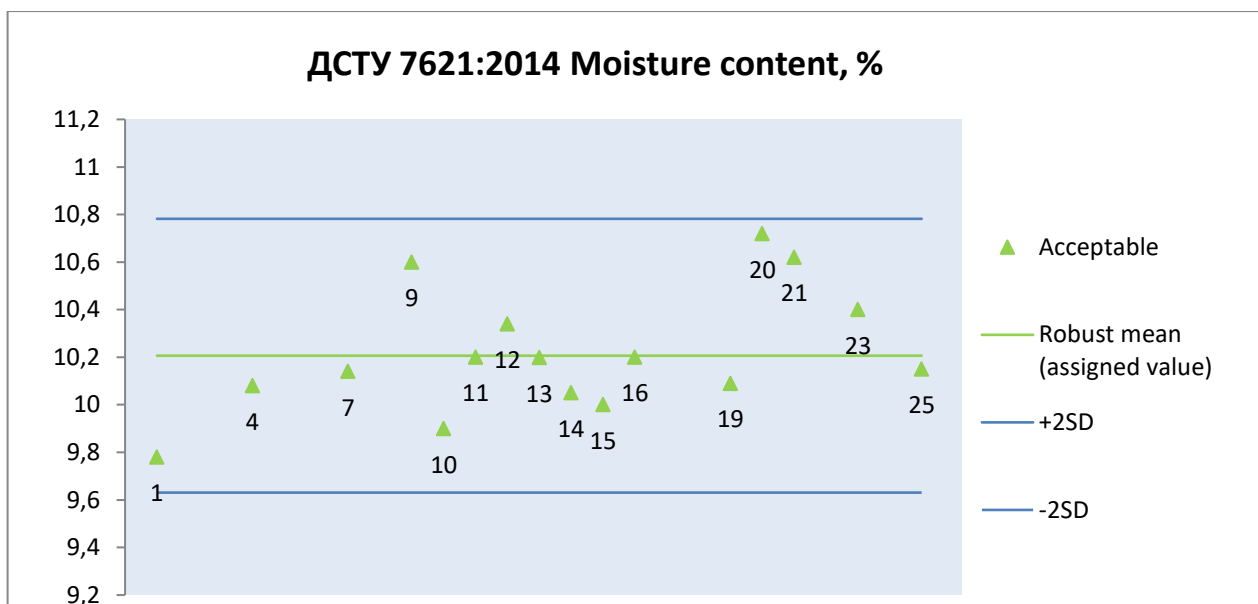
8.2.6. ISO 734:2023/ ДСТУ EN ISO 734:2022 (EN ISO 734:2015, IDT; ISO 734:2015, IDT) Fat content, % (expressed as a mass fraction of the product as received)



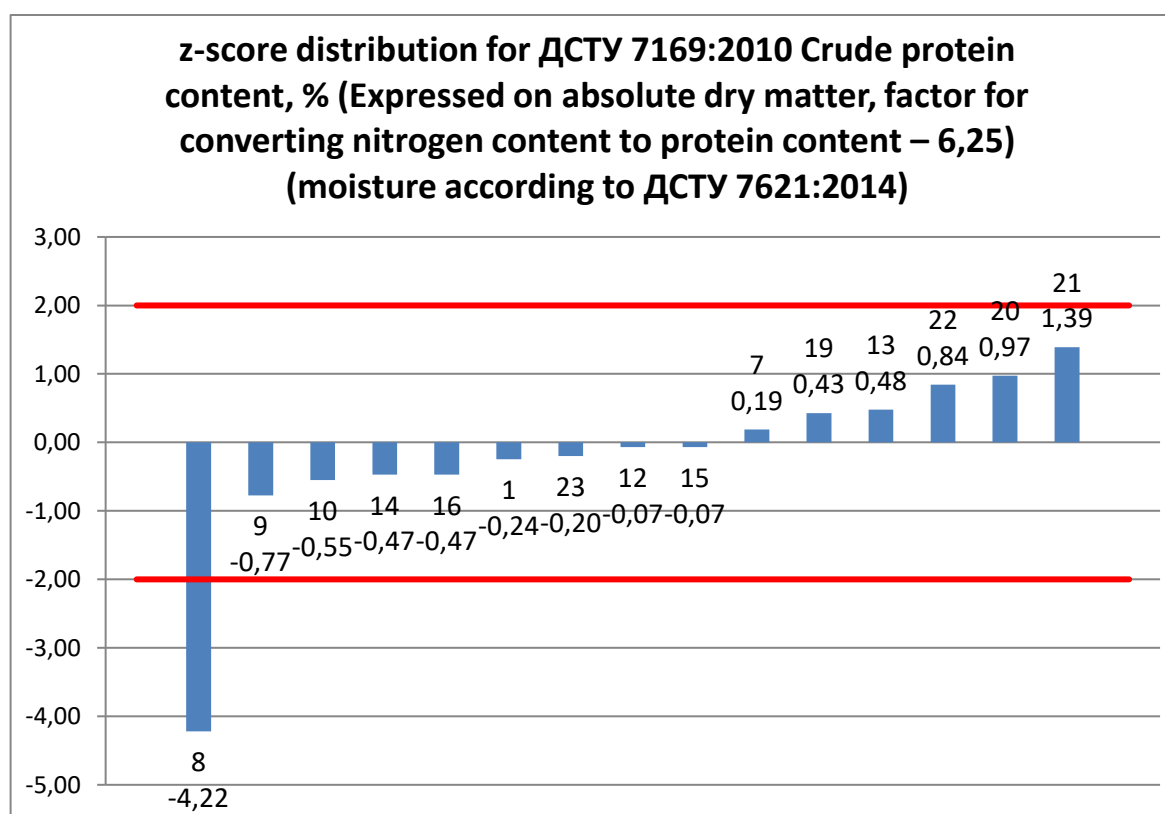
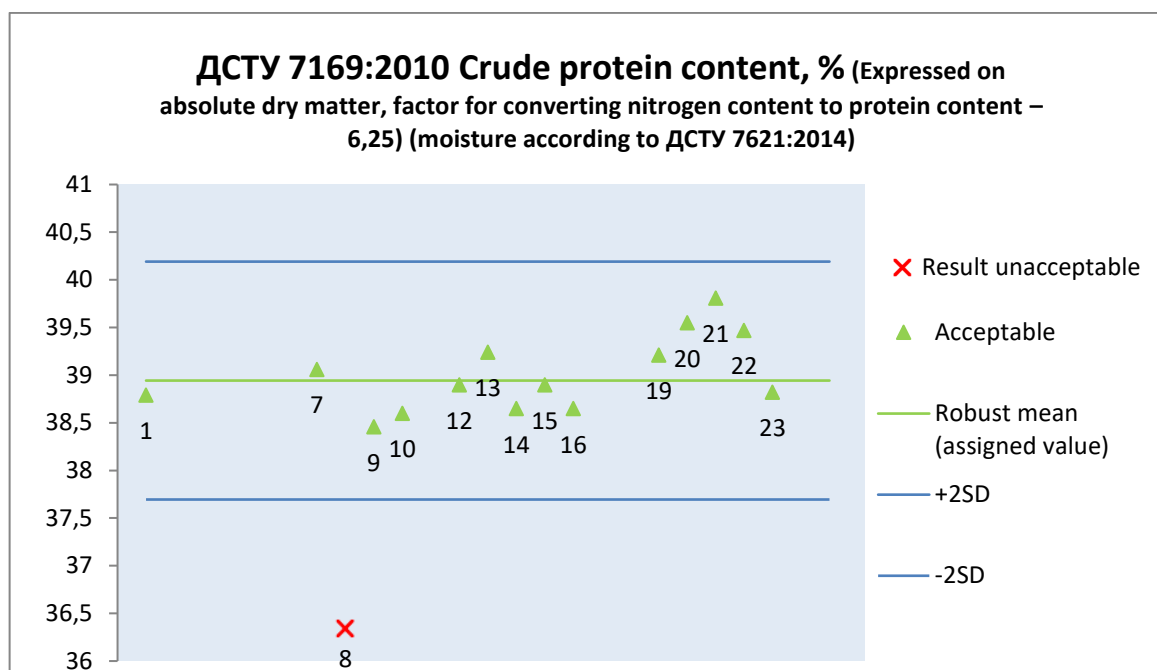
8.2.7. ISO 6865:2000/ ДСТУ EN ISO 6865:2022 (EN ISO 6865:2000, IDT; ISO 6865:2000, IDT) Crude fibre content, % (expressed as a mass fraction of the product as received)



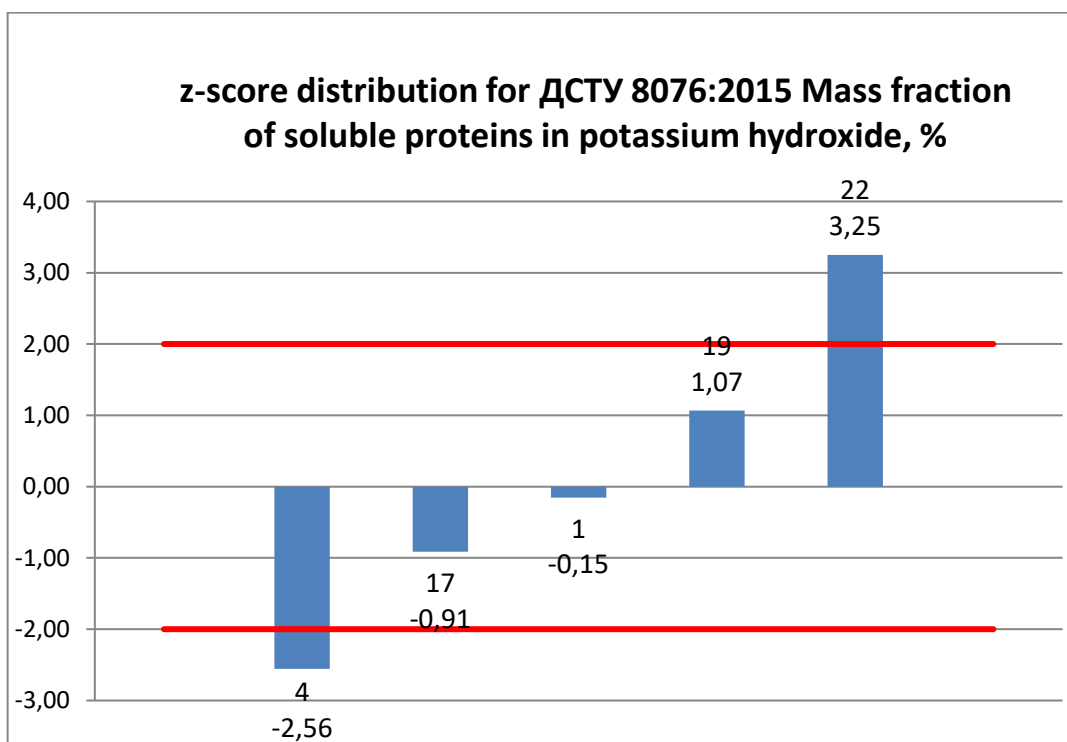
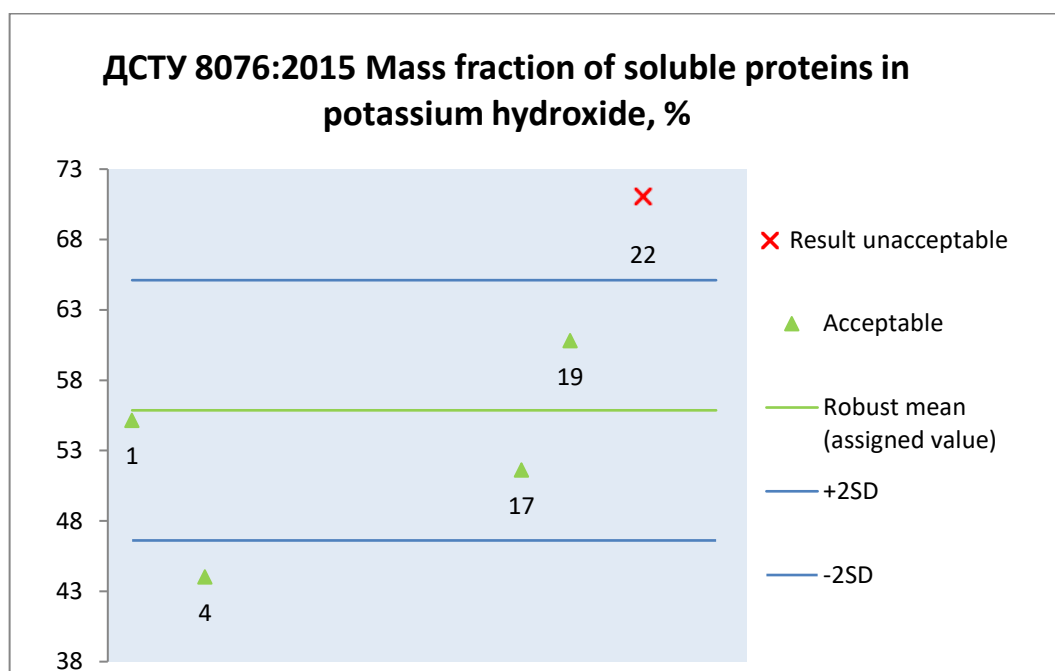
8.2.8. ДСТУ 7621:2014 Moisture content, %



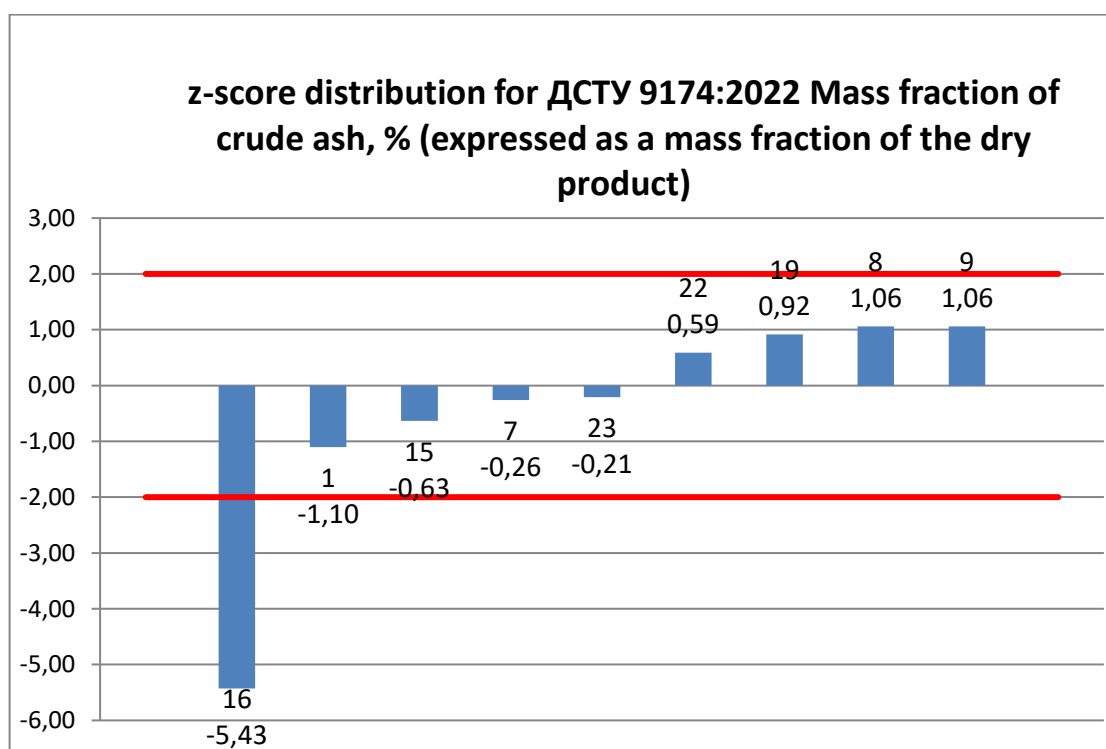
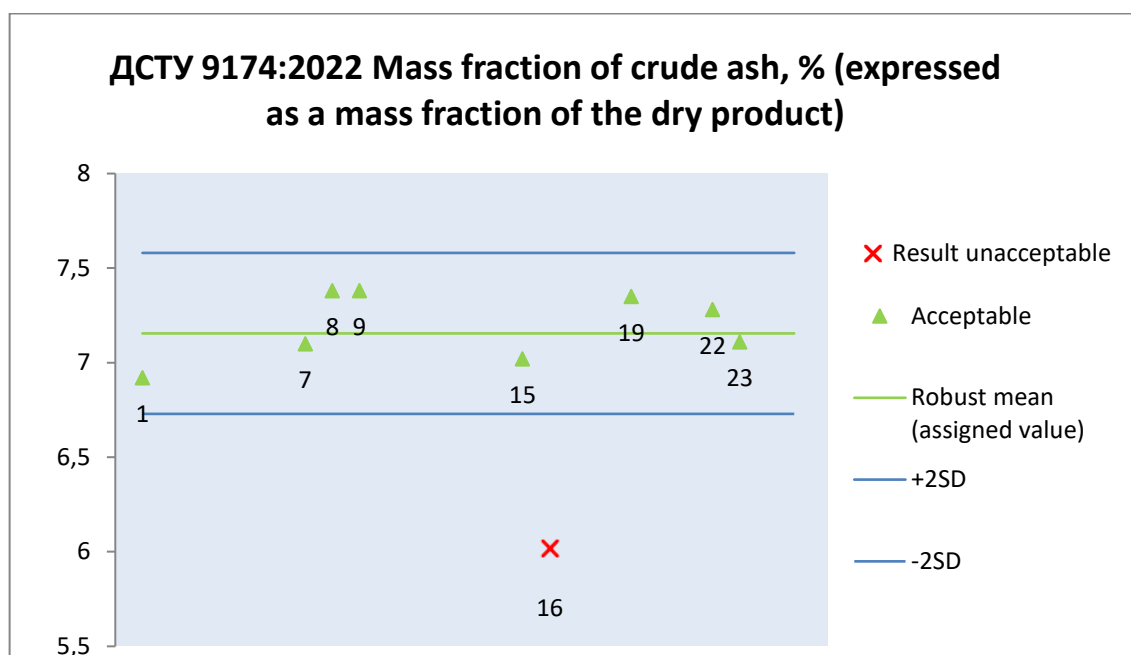
8.2.9. ДСТУ 7169:2010 Crude protein content, % (Expressed on absolute dry matter, factor for converting nitrogen content to protein content – 6,25) (moisture according to ДСТУ 7621:2014)



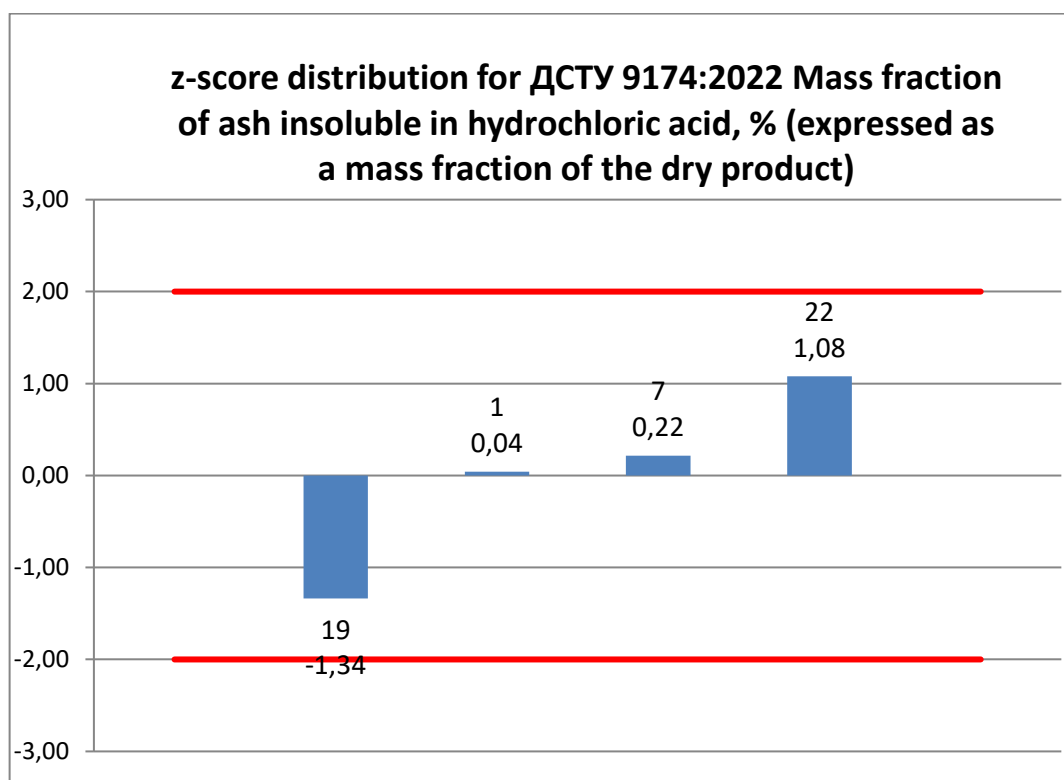
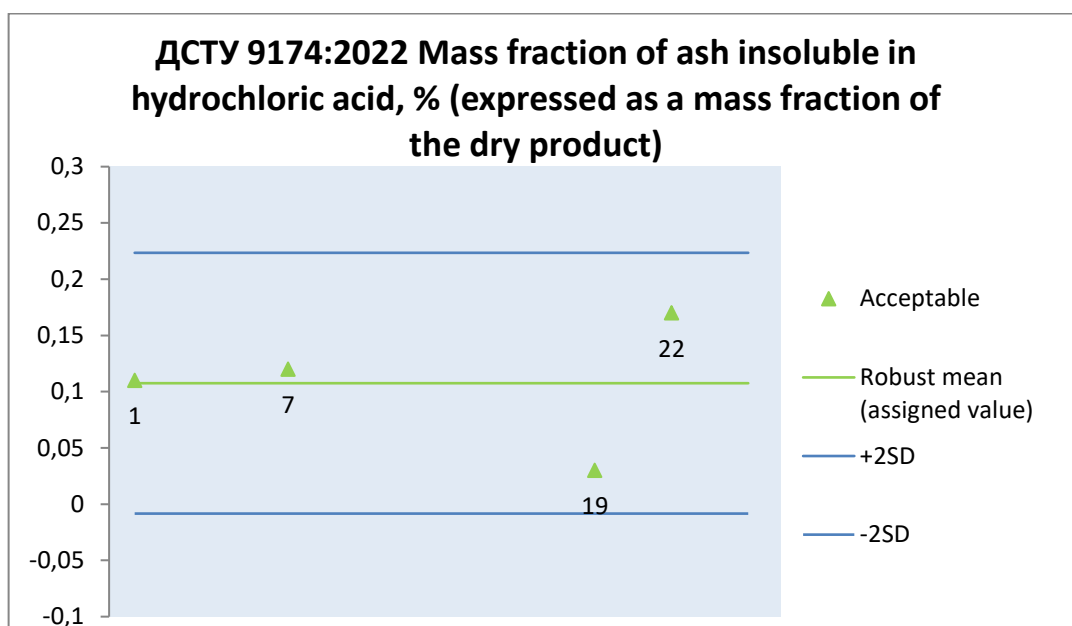
8.2.10. ДСТУ 8076:2015 Mass fraction of soluble proteins in potassium hydroxide, %



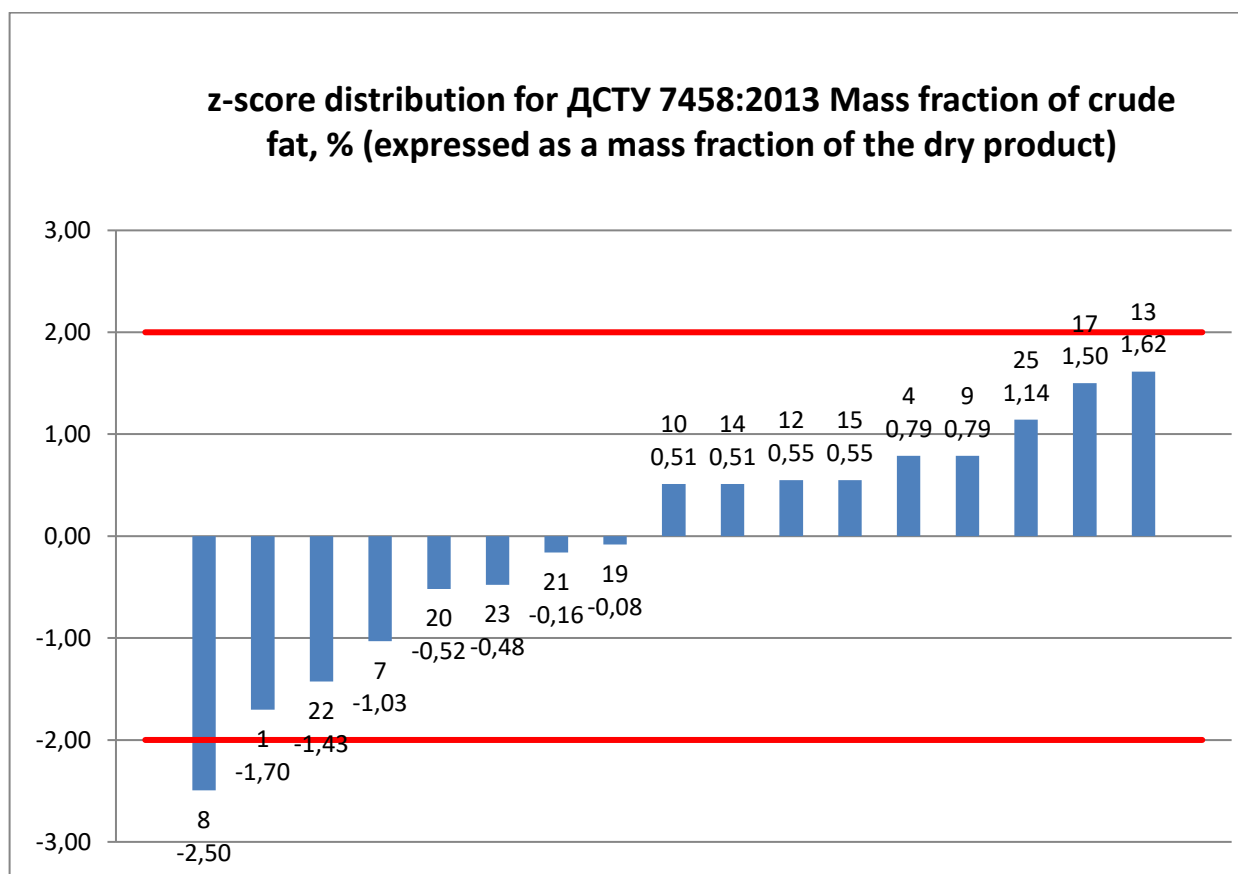
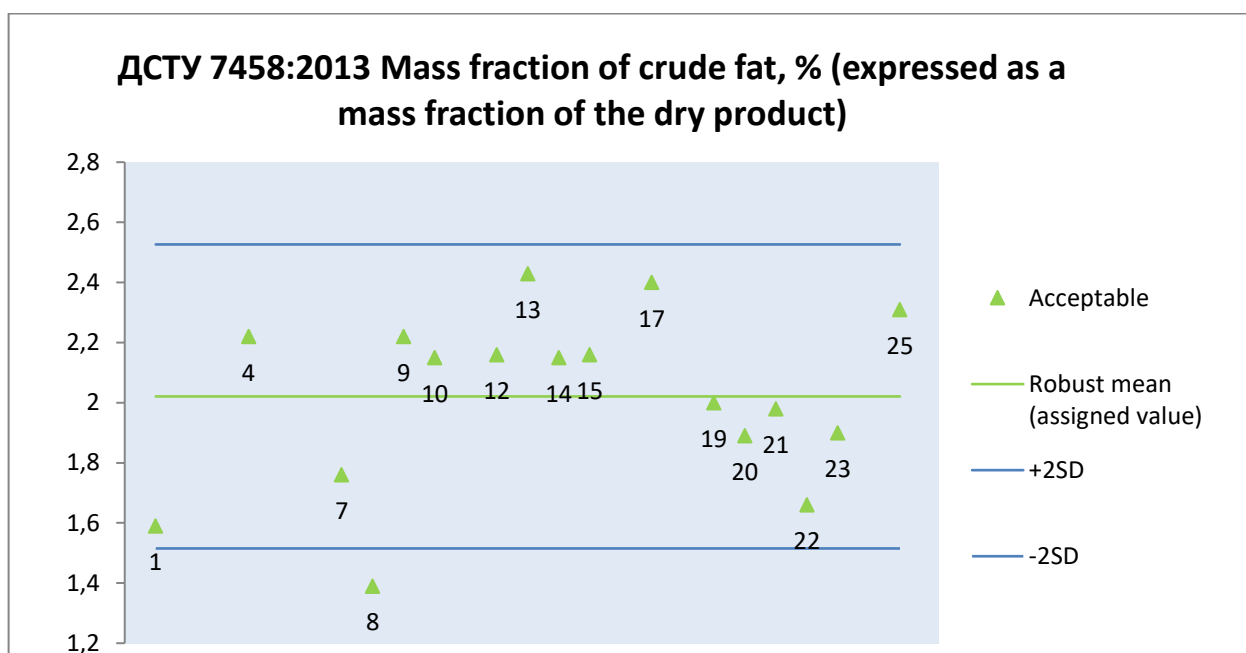
8.2.11. ДСТУ 9174:2022 Mass fraction of crude ash, % (expressed as a mass fraction of the dry product)



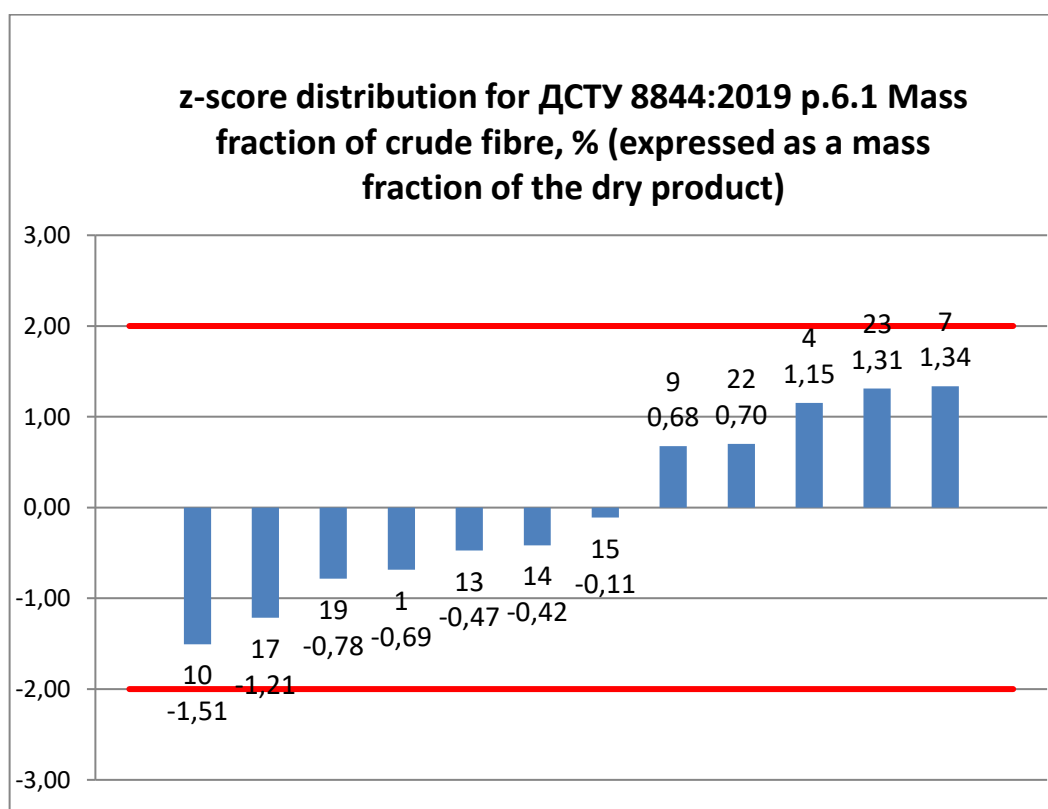
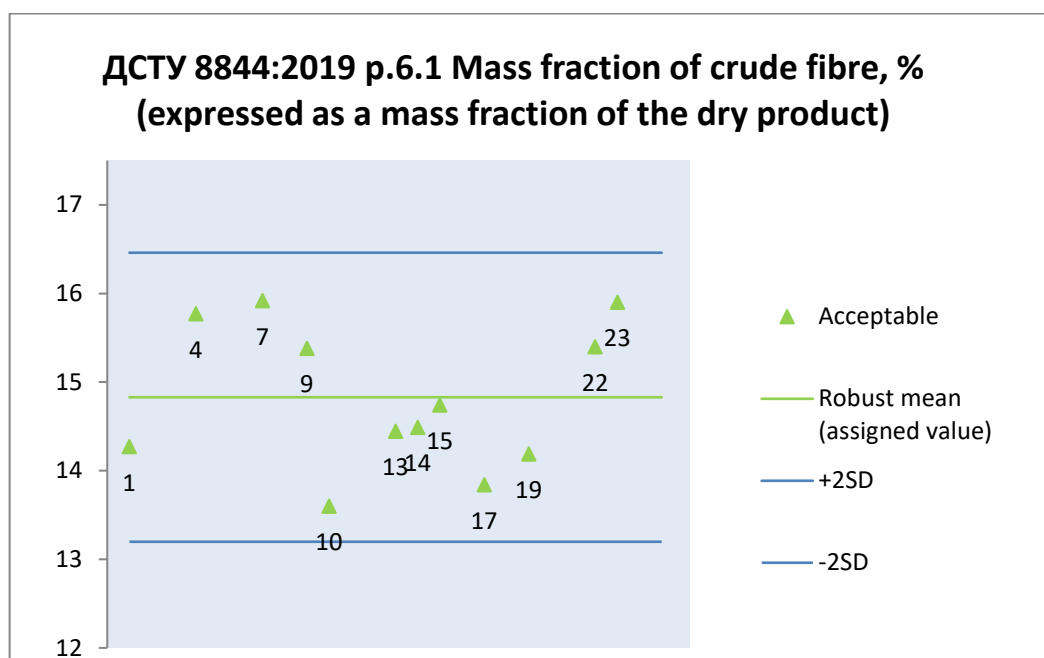
**8.2.12. ДСТУ 9174:2022 Mass fraction of ash insoluble in hydrochloric acid, %
(expressed as a mass fraction of the dry product)**



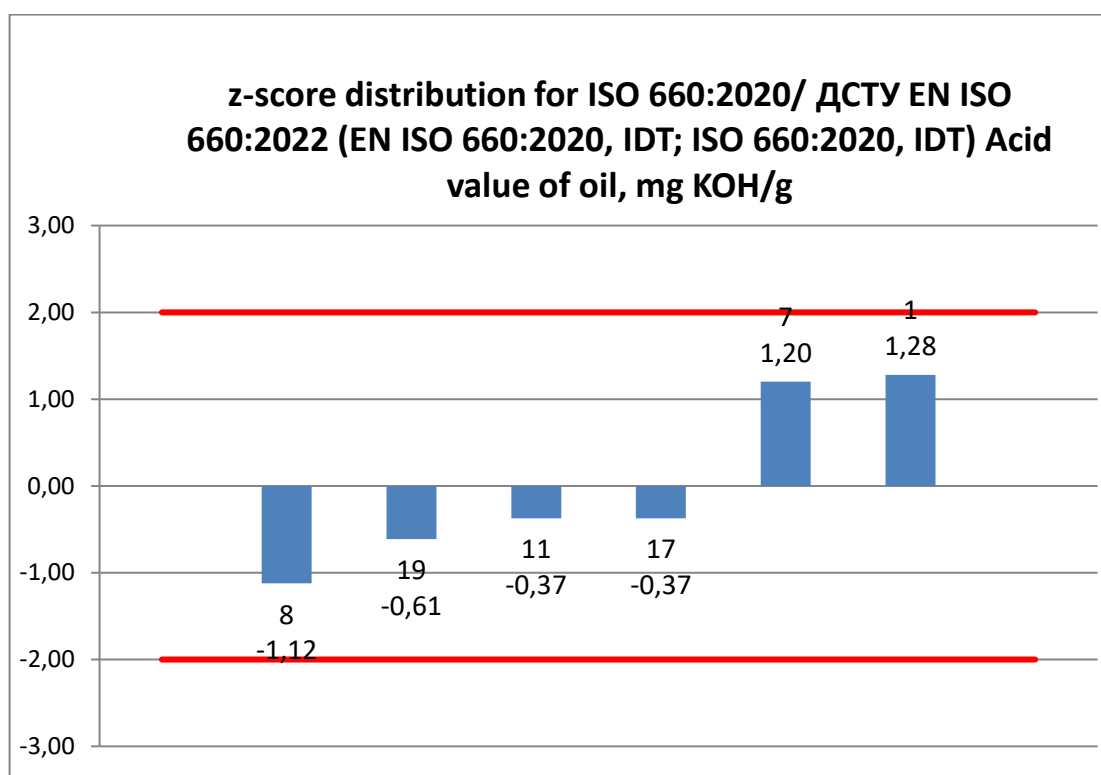
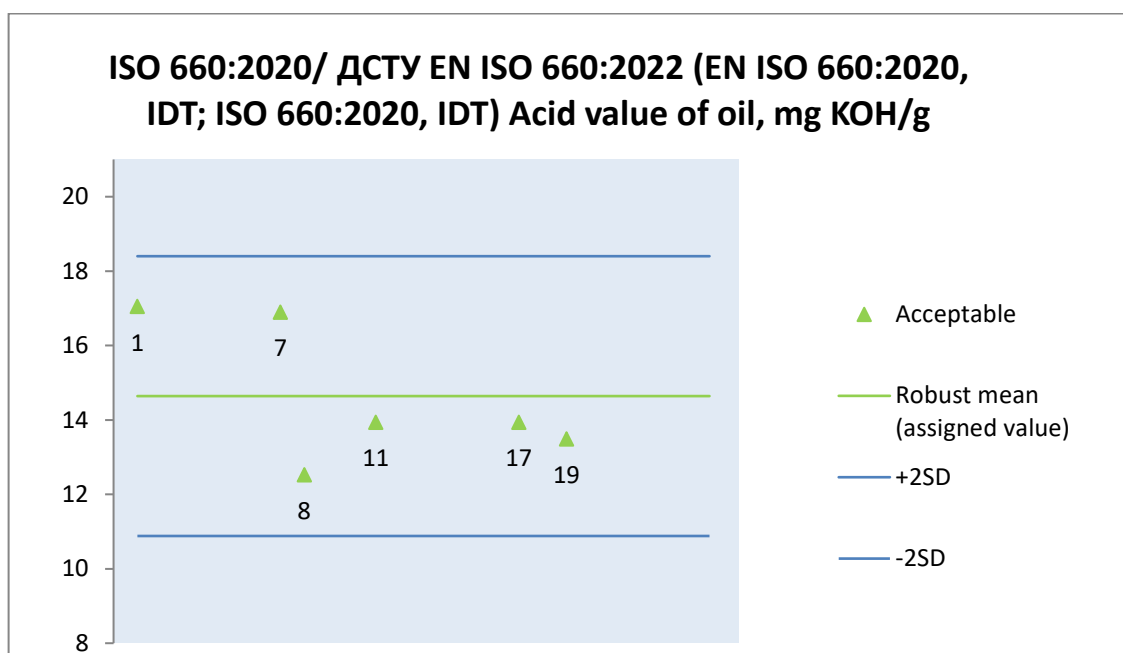
8.2.13. ДСТУ 7458:2013 Mass fraction of crude fat, % (expressed as a mass fraction of the dry product)



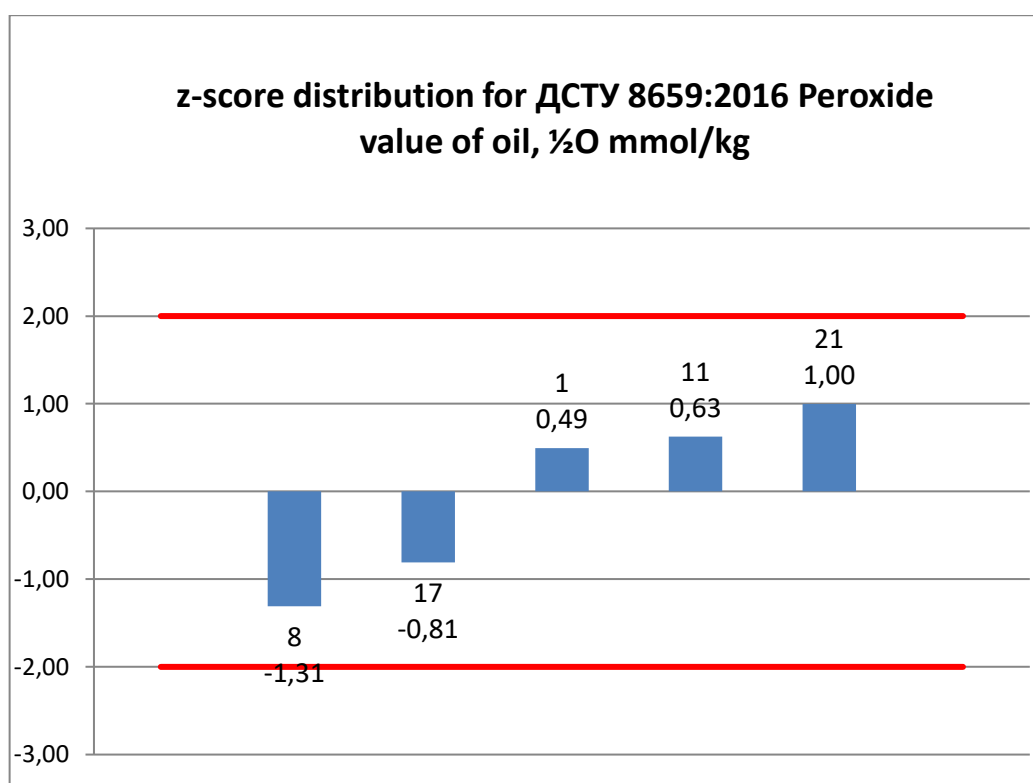
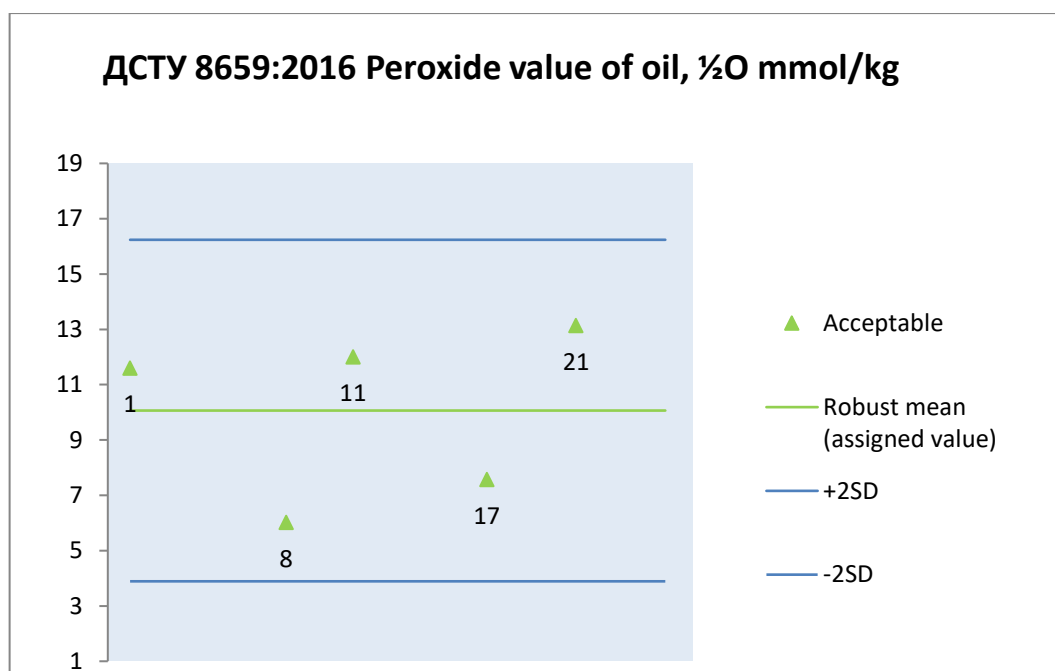
8.2.14. ДСТУ 8844:2019 p.6.1 Mass fraction of crude fibre, % (expressed as a mass fraction of the dry product)



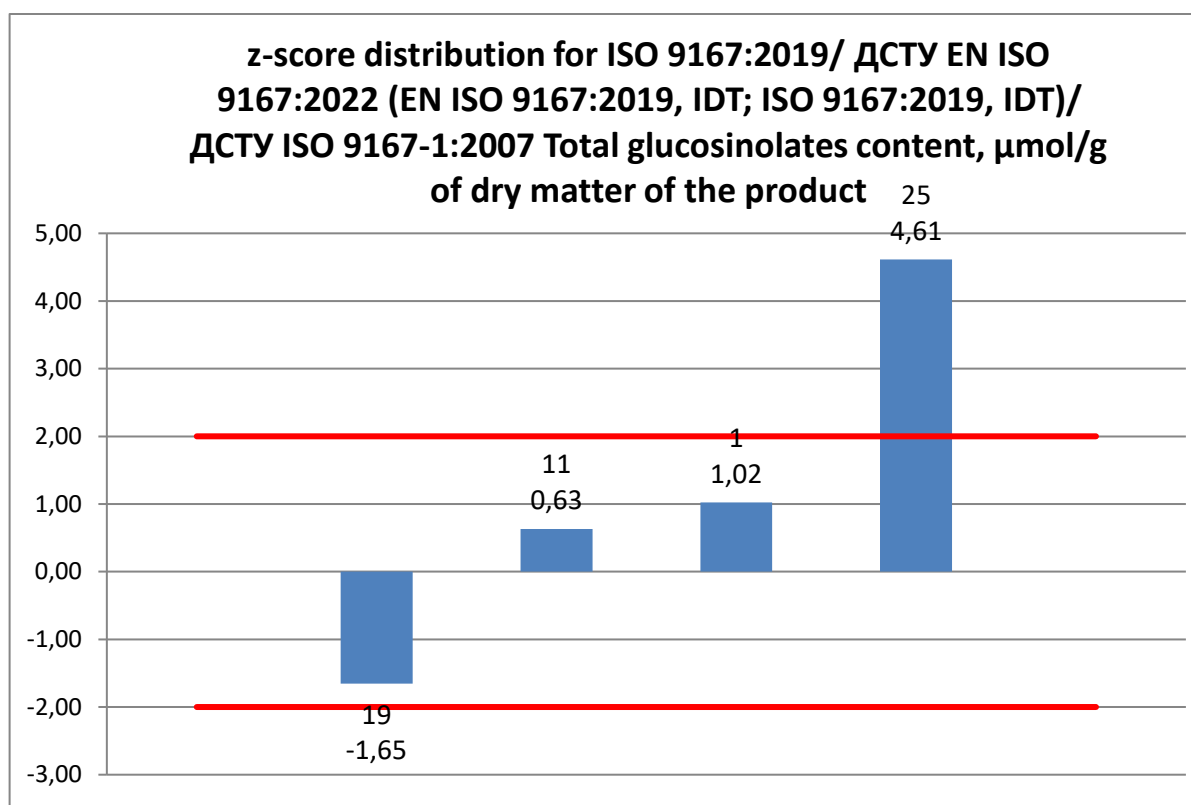
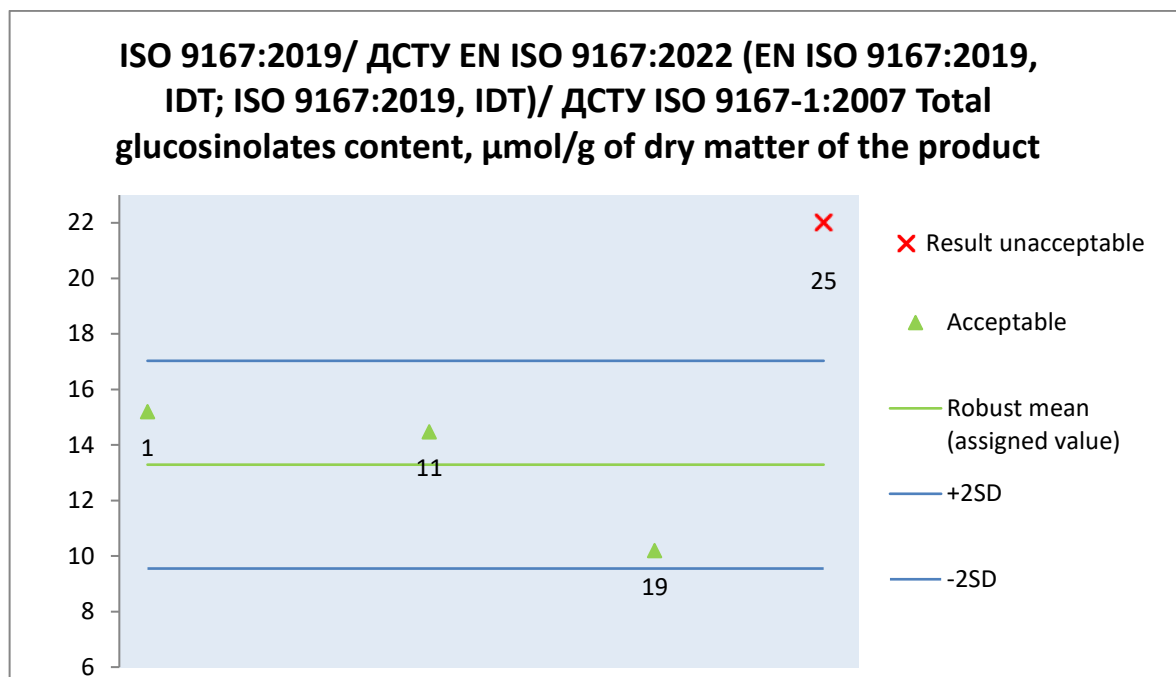
8.2.15. ISO 660:2020/ ДСТУ EN ISO 660:2022 (EN ISO 660:2020, IDT; ISO 660:2020, IDT) Acid value of oil, mg KOH/g



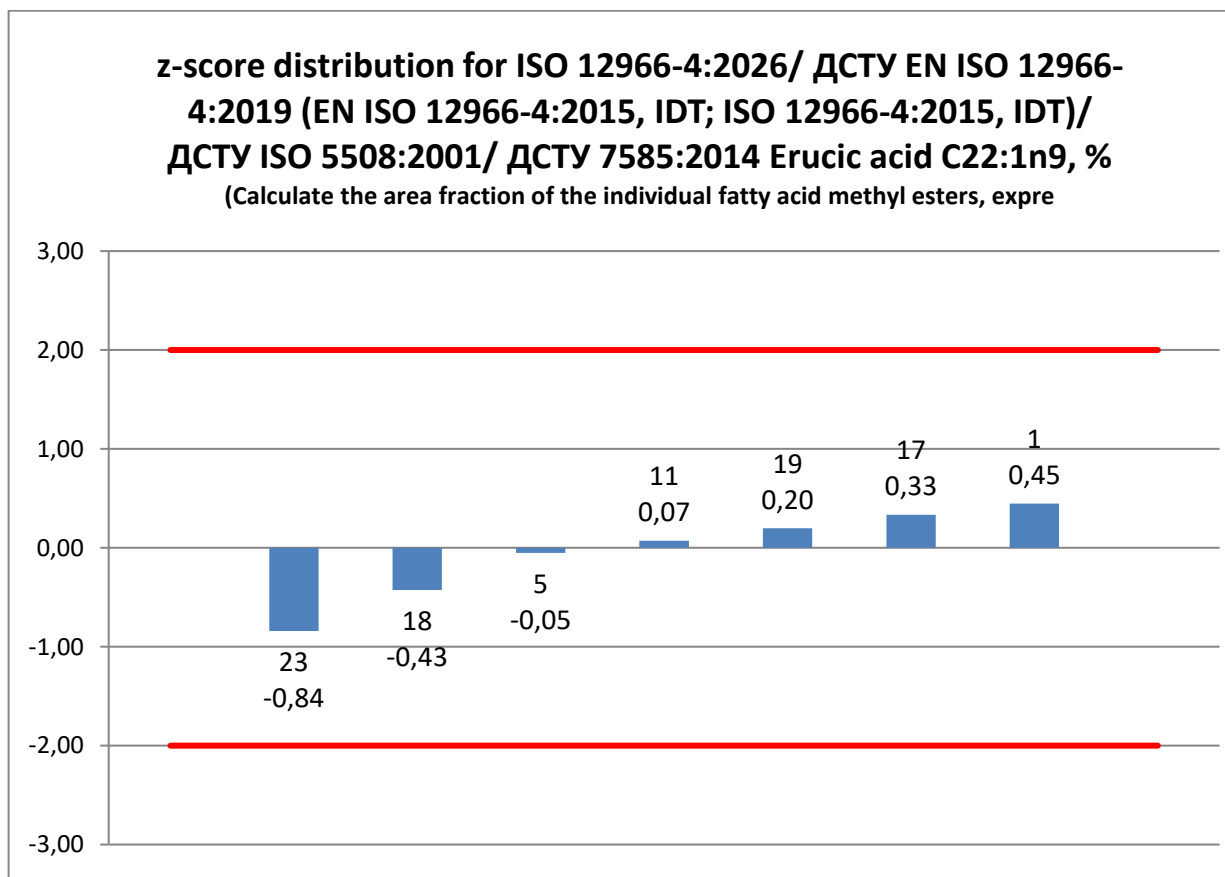
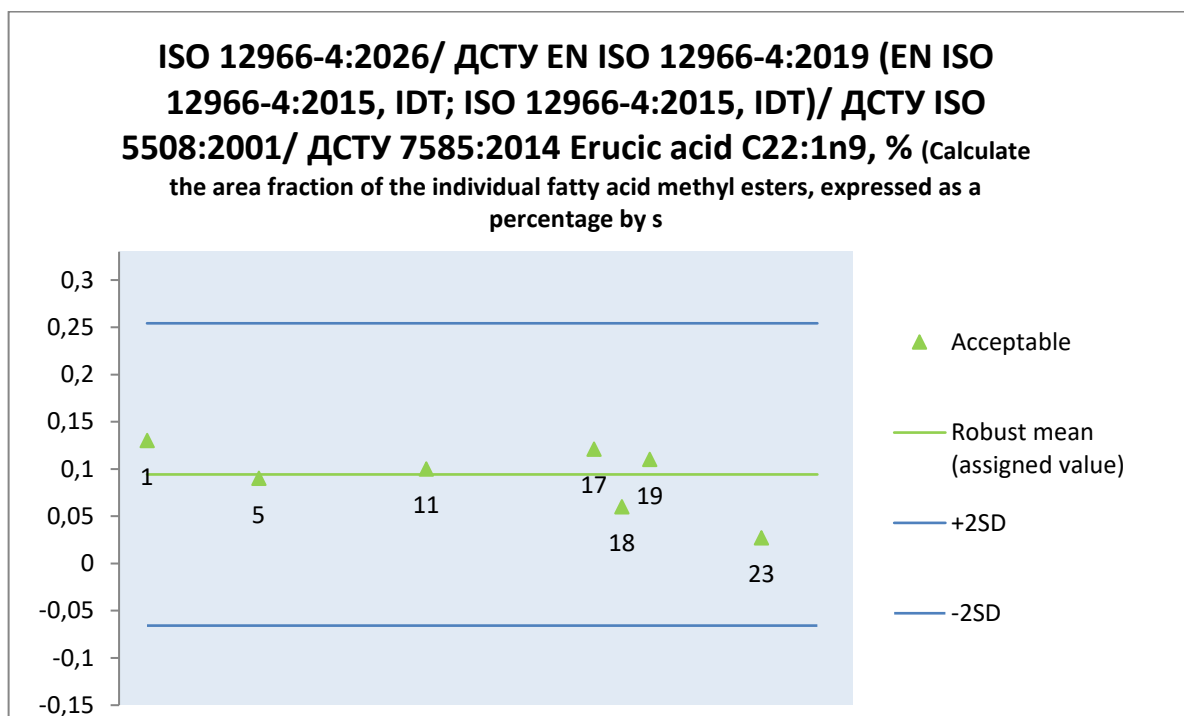
8.2.16. ДСТУ 8659:2016 Peroxide value of oil, ½O mmol/kg



8.2.17. ISO 9167:2019/ ДСТУ EN ISO 9167:2022 (EN ISO 9167:2019, IDT; ISO 9167:2019, IDT)/ ДСТУ ISO 9167-1:2007 Total glucosinolates content, $\mu\text{mol/g}$ of dry matter of the product



8.2.18. ISO 12966-4:2026/ ДСТУ EN ISO 12966-4:2019 (EN ISO 12966-4:2015, IDT; ISO 12966-4:2015, IDT)/ ДСТУ ISO 5508:2001/ ДСТУ 7585:2014 Erucic acid C22:1n9, % (Calculate the area fraction of the individual fatty acid methyl esters, expressed as a percentage by sum of areas under all peaks of all individual fatty acid methyl ester)



9. NORMATIVE REFERENCE

1. ISO/IEC 17043:2023 Conformity assessment – General requirements for the competence of proficiency testing providers.
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 33405:2024 Reference materials — Approaches for characterization and assessment of homogeneity and stability.
6. ILAC Discussion Paper on Homogeneity and Stability Testing, April 2008.