



NATIONAL STANDARD OF UKRAINE

SUNFLOWER

Specifications

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PREFACE

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here are bread products"; Institute of plant breeding named after V.Ya. Yuryeva of the Ukrainian Academy of Sciences; Ukrainian Institute of Expertise of Plant Varieties

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NATIONAL STANDARD OF UKRAINE

SUNFLOWER

Specifications

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Technical conditions

SUNFLOWER

Specification

Effective from 2010-01-01

1 SCOPE OF APPLICATION

This standard applies to sunflower seeds intended for food use, for the production of oleic acid and for export.

Mandatory requirements for sunflower seeds, which guarantee the safety of life and health of people, animals and environmental protection, are given in 4.1, 4.2 (condition, smell, color of seeds, moisture, harmful impurities, contamination by pests), 5.1 (content toxic elements, mycotoxins, radionuclides and pesticides), 5.2 (requirements for safety and industrial sanitation), 5.3 and 5.4 (environmental protection).

2 NORMATIVE REFERENCES

This standard contains references to the following normative documents: DSTU

2422-94 Grain procurement and supply. Terms and definitions

DSTU 3355-96 Agricultural plant products. Sampling methods in the process of quarantine inspection and examination

DSTU ISO 10565-2003 Oilseeds. Simultaneous determination of oil and moisture content. The method of spectrometry using pulsed nuclear magnetic resonance

GOST 17.2.3.02-78 Nature protection. Atmosphere. Rules for establishing permissible emissions of harmful substances by industrial enterprises (Protection of nature. Atmosphere. Rules for establishing permissible emissions of harmful substances by industrial enterprises)

GOST 10842-89 (ISO 520-77) Grain and legume crops and oilseeds. Method for determining the mass of 1000 grains or 1000 seeds (Grains of grain and leguminous crops and seeds of oil crops. Method for determining the mass of 1000 grains or 1000 seeds)

GOST 10852-86 Oilseeds. Acceptance rules and sampling methods (Oilseeds. Acceptance rules and sampling methods)

GOST 10853-88 Oilseeds. Method for determining pest infestation (Oilseeds. Method for determining pest infestation)

GOST 10854-88 Oilseeds. Methods of determination of weedy, oily and specially taken into account impurities (Oil seeds. Methods of determination of garbage, oily and specially taken into account impurities)

GOST 10856–96 Oilseeds. Moisture determination method (Oil seeds. Moisture determination method)

GOST 10857–64 Oilseeds. Oiliness determination methods (Oil seeds. Oiliness determination methods)

GOST 10858–77 Oilseeds. Industrial raw materials. Methods for determining the acid number of oil (Seeds of oil crops. Industrial raw materials. Methods for determining the acid number of oil)

GOST 13496.4–93 Fodder, compound feed, compound feed raw materials. Methods for determining the content of nitrogen and crude protein (Feed, compound feed, compound feed raw materials. Methods for determining the content of nitrogen and crude protein)

GOST 26597–89 Sunflower. The method of determining the acid number of oil using pH-metry (Sunflower. The method of determining the acid number of oil using pH-metry)

GOST 26927–86 Raw materials and food products. Mercury determination method (Raw materials and food products. Mercury determination method)

GOST 26929–94 Raw materials and food products. Sample preparation. Mineralization to determine the content of toxic elements (Raw materials and food products. Preparation of samples. Mineralization to determine the content of toxic elements)

GOST 26930–86 Raw materials and food products. Method for determining arsenic (Raw materials and food products. Method for determining arsenic)

GOST 26931–86 Raw materials and food products. Copper determination methods (Raw materials and food products. Copper determination methods)

GOST 26932–86 Raw materials and food products. Lead determination methods (Raw materials and food products. Lead determination methods)

GOST 26933–86 Raw materials and food products. Cadmium determination methods (Raw materials and food products. Cadmium determination methods)

GOST 26934–86 Raw materials and food products. Zinc determination method (Raw materials and food products. Zinc determination method)

GOST 27988–88 Oil seeds. Methods for determining color and smell (Oil seeds. Methods for determining color and smell)

GOST 28238–89 Sunflower. Method for determining the mass fraction of oleic acid based on the refractive index of oil (Sunflower. Method for determining the mass fraction of oleic acid based on the refractive index of oil)

GOST 29141–91 (ISO 664–90) Oilseeds. Extraction of a sample for analysis from an average sample (Seeds of oil crops. Extraction of a sample for analysis from an average sample)

GOST 29142–91 (ISO 542–90) Oilseeds. Sampling (Seeds of oil crops. Sampling)

GOST 30131–96 Cakes and meal. Determination of moisture, fat and protein by spectrometry in the near-infrared region (Cakes and meals. Determination of moisture, fat and protein by spectrometry in the near-infrared region).

3 TERMS AND DEFINITIONS

In this standard, the terms and their corresponding definitions of concepts are used in accordance with DSTU 2422, the Law of Ukraine "On Grain and the Grain Market in Ukraine" dated July 4, 2002 No. 37-IV, as well as the following:

impurities

Impurities of organic and inorganic origin, divided into oily and garbage, which affect the quality of sunflower seeds

3.1 oil impurity

3.1.1 beaten seeds

Sunflower seeds with the remains of the kernel less than half

3.1.2 seeds eaten by pests

Seeds with signs of kernel damage by pests

3.1.3 germinated seeds

Sunflower seeds with signs of germination

3.1.4 damaged seed

Seeds with a changed color of the kernel from gray-yellow to brown due to drying, self-heating or damage by diseases (rotten, moldy)

3.1.5 immature seeds

The seeds are slender with minimal kernel content

3.1.6 seeds captured by frost

The seeds are slender, whitish in color, with a weak shell and a discolored core

3.1.7 seeds damaged by herbivorous bugs

Seeds with dark spots on the kernel of different sizes and intensity

3.1.8 completely or partially fallen seeds

Completely or partially collapsed seeds with varying degrees of damage to the shell and core

3.2 garbage admixture**3.2.1 mineral admixture**

Impurities of mineral origin: sand, clods of earth, pebbles, etc

3.2.2 organic impurity

Impurities of organic origin: parts of stems and baskets, husk leaves, etc

3.2.3 harmful admixture

Impurities of plant origin, which harm human and animal health, change the organoleptic parameters of seeds and affect the choice of technological processes of its processing

3.2.4 spoiled seed

Sunflower seeds with a spoiled black kernel

3.3 main seed, oily and garbage impurities

3.3.1 To the main seed Sunflower includes whole and damaged sunflower seeds, which are due to the nature of the damage, it is not attributed to oil and garbage impurities.

3.3.2 To oil impurities are carried in the residue on a sieve with mesh diameter 3.0 mm seeds of soyashnyk:

- beaten;
- pressed;
- eaten by pests;
- germinated;
- damaged;
- unripe;
- seeds captured by frost;
- completely or partially collapsed;
- damaged by herbivorous bugs.

3.3.3 To garbage impurities include:

- impurities passing through a sieve with meshes of 3.0 mm in diameter;
- in the residue on a sieve with meshes with a diameter of 3.0 mm: mineral admixture; organic admixture; empty seed; seeds of all wild and cultivated plants; harmful admixture; spoiled seed.

4 GENERAL TECHNICAL REQUIREMENTS

4.1 Requirements for the quality of sunflower seeds used for food and production of oleic acid are shown in Table 1.

4.2 In the case of using sunflower seeds for oil production, the mass fraction indicator oil is not required to determine the class. The norm is provided for inclusion in the contract on the supply of sunflower seeds to domestic processing enterprises in Ukraine.

Table 1— Requirements for the quality of sunflower seeds

Indicator	Limit rate				
	for oil production			for production confectionery products	for production oil industry your acids
	first class	second class	third class		
Humidity, %:					
no less than	6.0	6.0	6.0	6.0	6.0
not more than	8.0	8.0	8.0	8.0	8.0
Oil impurity, %, no more than	3.0	5.0	7.0	5.0	5.0
particularly germinated seeds	1.0	2.0	3.0	2.0	2.0
Garbage admixture, %, no more than	1.0	2.0	3.0	3.0	3.0
in particular					
spoiled seed	0.2	0.5	1.0	0.5	1.0
mineral admixture,	0.3	0.5	0.5	0.5	0.5
in particular, pebbles, slag, ore	0.15	0.3	0.3	0.3	0.3
castor seeds	Is not allowed				
Mass fraction of oil in terms of dry matter, %:					
no less than	50.0	45.0	40.0	—	—
not more than	—	—	—	42.0	—
Mass fraction of crude protein in terms of dry matter, %, not less than	—	—	—	19.0	—
Mass fraction of oleic acid in oil, %, not less than	—	—	—	—	60.0
The acid value of the oil, mg KOH/g, is no more than	1.3	2,2	5.0	5.0	5.0
Weight of 1000 seeds,g, not less than	—	—	—	70.0	—
Infection with grain pests	Is not allowed	Not allowed, except for tick infestation not higher than II degree			

4.3 Sunflower seeds, regardless of the field of use, must be in a healthy state, without self-heating and thermal damage during drying; to have a smell characteristic of healthy seeds (without musty, moldy, other extraneous smells); have a normal color according to certain varietal characteristics.

4.4 In the case of non-compliance of sunflower seeds with the maximum norm according to the indicator of the acid number of the oil it is used for technical needs (for the production of oil, etc.).

4.5 With the consent of grain warehouses, other business entities are allowed to supply sunflower seeds with moisture and the content of oil and waste impurities above the limit, if it is possible to bring such seeds to the quality indicators specified in table 1.

4.6 Sunflower seeds formed for export must be in a healthy state, not infected destroyed by pests of grain and seeds, have a normal smell and color. Requirements for other quality indicators are established in the agreement (contract) between the supplier and the buyer.

5 SAFETY AND ENVIRONMENTAL PROTECTION REQUIREMENTS

5.1 The content of toxic elements, mycotoxins and pesticides in sunflower seeds used for food needs, as well as for export, should not exceed the permissible levels established by MBTiSN 5061 [1]. According to radiological indicators, sunflower seeds must meet the requirements of GN 6.6.1.1-130 [2]. The maximum permissible content of harmful substances in sunflower seeds is given in Appendix A.

5.2 When working with sunflower seeds, you must follow the requirements set forth in the "Rules of safety and industrial sanitation techniques at grain storage and processing enterprises of the Ministry of Bakery Products of the USSR" No. 99 [3].

5.3 They control compliance with the norms of emissions of harmful substances into the atmosphere in accordance with the requirements GOST 17.2.3.02 and DSP 201 [4].

5.4 They protect the soil from contamination by household and industrial waste in accordance with the requirements SanPiN 42-128-4690 [5].

6 RULES OF ACCEPTANCE

6.1 Acceptance rules are in accordance with GOST10852.

6.2 In each batch of sunflower, the condition of the seeds, smell, color, moisture, oiliness and waste are determined impurities, contamination, oil acid number. In batches of sunflower intended for confectionary needs, the mass fraction of protein and the mass of 1000 seeds are also determined; in batches of sunflower for the production of oleic acid — its mass share.

6.3 Control of the content and frequency of control of toxic elements, mycotoxins, etc of pesticides in sunflower seeds, used for food needs and for export, is carried out in accordance with MR 4.4.4-108 [6].

6.4 Each batch of sunflower seeds is accompanied by a certificate on the content of pesticides, toxic elements, mycotoxins, radionuclides and a certificate or certificate of quality.

7 CONTROL METHODS

7.1 Samples are selected and separated for analysis according to GOST29142 (ISO 542-90), GOST 29141 (ISO 664-90), GOST 10852 and DSTU 3355.

7.2 Determine the smell, color according to GOST27988.

7.3 Humidity is determined according to GOST10856 and DSTU ISO 10565.

7.4 Define oily, garbage and specially taken into account impurities according to GOST10854.

7.5 Pest infestation is determined in accordance with GOST10853.

7.6 The mass fraction of oil is determined according to GOST10857 and DSTU ISO 10565.

7.7 The mass fraction of crude protein is determined according to GOST13496.4, using meal that remained during the determination of the mass fraction of oil, according to GOST 30131.

7.8 Determine the mass fraction of oleic acid according to GOST28238.

7.9 Determine the acid value of the oil according to GOST10858 and GOST 26597.

7.10 Determine the mass1000 seeds according to GOST 10842 (ISO 520-77).

7.11 Determination of toxic elements

Prepare samples for analysis according to GOST 26929, determine mercury according to GOST 26927, arsenic — according to GOST 26930, copper — according to GOST 26931, lead — according to GOST 26932, cadmium — according to GOST 26933, zinc — according to GOST 26934.

7.12 Pesticides in sunflower seeds are determined according to DSanPIN8.8.1.2.3.4-000 [7].

7.13 Determine mycotoxins in sunflower seeds for food needs according to the methods claimed by the Ministry of Health: aflatoxin B₁— according to MR 2273 [8] or MR 4082 [9]; zearalenone - according to MR 2964 [10]; T-2 toxin - according to MU 3184 [11].

7.14 Define radionuclides: strontium-90 — according to MU 5778 [12] and cesium-137 — according to MU 5779 [13].

8 TRANSPORTATION AND STORAGE

8.1 Sunflower seeds are transported in bulk by all types of transport in accordance with the rules of transportation transport of goods valid for this type of transport.

8.2 Vehicles must be clean, without extraneous odors. During loading, re-transportation and unloading of sunflower seeds must be protected from precipitation.

8.3 Sunflower seeds are placed and stored in clean, dry, odorless, non-contaminated destroyed by grain pests in granaries in accordance with sanitary rules and storage conditions approved in accordance with the established procedure in Ukraine. Batches of sunflower seeds of the 1st, 2nd, and 3rd classes, intended for oil production, are placed, transported and stored separately in conditions that prevent their mixing. Batches of sunflower seeds, grown in fields without the use of pesticides, intended for baby food, are placed and stored separately from other batches. Batches of sunflower seeds for confectionary needs and for the production of oleic acid, as well as batches affected by white or gray rot, are also placed, stored and transported separately.

8.4 During transportation, placement and storage of sunflower seeds, take into account the condition, given in table 2.

Table 2— Condition of sunflower seeds according to moisture and clogging

Condition of sunflower seeds	Humidity, %	Oil impurity, %	Garbage admixture, %
By humidity:			
dry	Up to 7 incl.		
medium dryness	From 7.1 to 8 inclusive.		
wet	From 8.1 to 9 inclusive.		
raw	Over 9.1		
By clogging:			
clean		Up to 3 incl.	Up to 1 incl.
medium purity		From 3.1 to 7 inclusive.	From 1.1 to 5 inclusive.
rubbish		Over 7.1	Over 5.1

9 WARRANTIES OF THE SUPPLIER

9.1 The supplier company guarantees the compliance of sunflower seeds with the requirements of this standard in case of compliance with the conditions of transportation and storage.

9.2 Warranty period of storage of sunflower seeds —6 months from the date of storage.

9.3 After the warranty period of storage, the quality of the seeds is checked for compliance requirements of the standard. In the case of positive analysis results, the storage period of sunflower seeds is extended.

APPENDIX A
(mandatory)

**MAXIMUM ALLOWABLE LEVEL OF CONTENT OF
HARMFUL SUBSTANCES IN SUNFLOWER SEEDS**

Indicator	The maximum permissible level of the content of harmful substances in sunflower seeds
Toxic elements, mg/kg:	
lead	0.5
cadmium	0.1
arsenic	0.2
mercury	0.03
copper	10.0
zinc	50.0
Mycotoxins, mg/kg:	
aflatoxin B ₁	0.005
zearalenone	1.0
T-2 toxin	0.1
Radionuclides, Bq/kg:	
strontium-90	20.0
cesium-137	50.0
Pesticides	The list of pesticides, the content of which is controlled in sunflower seeds, depends on their use in a specific territory, and it is coordinated with the services of the Ministry of Health of Ukraine

APPENDIX B
(reference)

BIBLIOGRAPHY

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2 ГН 6.6.1.1-130–2006 Permissible levels of radionuclide content¹³⁷Cs and⁹⁰Sr in food products and drinking water, approved by the Ministry of Health of Ukraine 05.03.2006 No. 256.

3 Safety and industrial sanitation regulations at grain storage and processing enterprises of the USSR Ministry of Bakery Products (Rules for safety and industrial sanitation at grain storage and grain processing enterprises of the USSR Ministry of Bakery Products), approved by the USSR Ministry of Bakery Products on April 18, 1988 No. 99.

4 DSP 201–97 State sanitary rules for the protection of atmospheric air in populated areas (against contamination by chemical and biological substances), approved by the Ministry of Health of Ukraine on 07.09.97 No. 201.

5 SanPiN 42-128-4690–88 Sanitary rules for the maintenance of populated areas (Sanitary rules for maintaining the territories of populated areas), approved by the Ministry of Health of the USSR on August 5, 1988 No. 4690.

6 MR 4.4.4-108–2004 Periodicity of control of food raw materials and food products according to safety indicators, approved by the Ministry of Health on July 2, 2004 No. 329.

7 DSanPiN 8.8.1.2.3.4-000–2001 Permissible doses, concentrations, quantities and content levels of pesticides in agricultural raw materials, food products, air of the working area, atmospheric air, water of reservoirs, soil, approved by the Ministry of Health of Ukraine on 20.09.2001 No. 137.

8 MP 2273–80 Methodological recommendations for detection, identification and determination of aflatoxin content in food raw materials and food products (Methodical recommendations for detection, identification and determination of aflatoxin content in food raw materials and food products), approved by the Ministry of Health USSR 10.12.80 No. 2273.

9 MR 4082–86 Methodological recommendations for the detection, identification and determination of the content of aflatoxins in food raw materials and food products using high-performance liquid chromatography (Methodological recommendations for the detection, identification and determination of the content of aflatoxins in food raw materials and food products according to using high-performance liquid chromatography), approved by the Ministry of Health of the USSR on March 20, 1986 No. 4082.

10 MR 2964–84 Methodological recommendations for the detection, identification and determination of the content of zearalenone in food products (Methodical recommendations for the detection, identification and determination of the content of zearalenone in food products), approved by the Ministry of Health of the USSR on 01.23.84 No. 2964.

11 MU 3184–84 Methodological instructions for detection, identification and determination of T-2 toxin in food products (Methodical instructions for detection, identification and determination of T-2 toxin in food products), approved by the Ministry of Health of the USSR on 12.29.84 No. 3184.

12 MU 5778–91 Strontium-90. Determination in food products (Strontium-90. Determination in food products), approved by the Ministry of Health of the USSR 04.01.91 No. 5778.

13 MU 5779–91 Cesium-137. Determination in food products (Cesium-137. Determination in food products), approved by the Ministry of Health of the USSR on 04.01.91 No. 5779.

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