THE GOST OF THE REPUBLIC OF KAZAKHSTAN

WHEAT BREAD FLOUR

FORTIFIED

General technical specifications

ST RK 1741 - 2008

Official edition

The Committee on Technical Regulating and Metrology
of the Ministry of Industry and Trade of the Republic of Kazakhstan
(GOST)

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ST RK 1741 - 2008

PREAMBLE

1. **DEVELOPED** by Kazakhstan Union of Grain Processors and Bakers, Kazakh Academy of Nutrition.
   INTRODUCED by Kazakhstan Union of Grain Processors and Bakers.

2. **APPROVED AND CAME INTO FORCE** by the order of the Committee on Technical Regulating and Metrology of the Ministry of Industry and Trade of the Republic of Kazakhstan No.109-од dated April 11, 2008.

3. **FIRST CHECK PERIOD** **2013**
   INTERVAL **5 years**

4. This standard is partially harmonized with ISO 5531:1978 "Wheat flour. Determination of raw gluten", CODEX STAN 152:1985 "Wheat flour" (revision I - 1995) as regards paragraphs 1., 2., 3.1, 3.2, 5., 6.,7. And determination of gluten at export operations.

5. The Standard complies with the requirements of the Regulations on fortification of food products subject to the sanitary and epidemiological surveillance, developed in accordance with subparagraph 5) of article 5 of the Law of the Republic of Kazakhstan "On food safety" dated July 21, 2007 and approved by the resolution of the Government of the Republic of Kazakhstan No.32 dated January 19, 2008.

6. **INTRODUCED FOR THE FIRST TIME**

Contents

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Introduced on 2009.01.01.

1 Scope of application

This standard applies to the fortified bread wheat flour (fortified flour), processed from the flour of high and first grades, produced according to ST RK 1482 or GOST 26574 and fortified with the vitamin-mineral premix or pre-mixture on the basis thereof.

Safety indicators are set forth in subparagraph: 5.3 (content of corncockle, toxic impurities and seeds of heliotropium dasycarpum and Trichodesma incanum), 5.4 (content of mineral and metal foreign matter, pest infetstaion and filth), 5.9 (content of toxic elements, mycotoxins, pesticides and radionuclides, as well as microbiological contamination), 6.3 (interval of control over the content of toxic elements, mycotoxins, pesticides and radionuclides, as well as microbiological indicators).

2 Regulatory references

The references to the following standards are used therein:

ST RK 1.1 -2005	State technical regulation system of the Republic of Kazakhstan. Standardization. Terms and definitions.
ST RK 2.34 - 2001	Procedure of the state metrological control over the quantity of packed-up goods in packages of any type. General requirements.
ST RK 1010 - 2002	Food products. Information of consumers.
ST RK 1054 - 2002	Grain. Method for determination of amount and quality of gluten in wheat using mechanized tools.

ST RK 1081 -2002	Procedure of the development of technology guidelines and food products formulas. General provisions.
ST RK 1482 - 2005	Wheat flour. General specification.
GOST 4403-91	Fabrics of silk and synthetic threads for sieves. General specifications.
GOST 9353-90	Wheat. Requirements for state purchases and deliveries.
GOST 9404-88	Flour and bran. Method of moisture content determination.
GOST 10444.12-88	Food products. Method for determination of yeast and mould.
GOST 10444.15-94	Food products. Methods for determination of quantity of aerobes and facultative aerobes.
GOST 20239-74	Flour, groats and bran. Determination method of metallomagnetic admixture.
GOST 26361-84	Flour. Method for determination of whiteness.
GOST 26574-85	Wheat bakery flour. Specifications.
GOST 26791-89	Milled cereal products. Packing, marking, transportation and storage.
GOST 26927-86	Raw material and food-stuffs. Methods for determination of mercury.
GOST 26928-86	Food-stuffs. Method for determination of iron.
GOST 26929-94	Raw material and food-stuffs. Preparation of samples. Decomposition of organic matters for analysis of toxic elements.
GOST 26930-86	Raw material and food-stuffs. Method for determination of arsenic.
GOST 26932-86	Raw material and food-stuffs. Method for determination of lead.
GOST 26933-86	Raw material and food-stuffs. Method for determination of cadmium.
GOST 26934-86	Raw material and food-stuffs. Methods for determination of zinc.
GOST 27493-87	Flour and bran. Methods for determination of acidity by beaten-up flour and water.
GOST 27494-84	Flour and bran. Methods for determination of ash.
GOST 27495-87	Flour. Method for determination of autolytic activity.
GOST 27558-87	Flour and bran. Methods for determination colour, odour, taste and crunch.
GOST 27559-87	Flour and bran. Methods for determination of pest infestation and filth test.
GOST 27560-87	Flour and bran. Methods for determination of particle size.
GOST 27668-88	Flour and bran. Acceptance and sampling methods.
GOST 27669-88	Wheat bread flour. Method for experimental laboratory breadmaking.

GOST 27676-88	Cereals and cereal milled products. Method for determination of falling number.
GOST 27839-88	Wheat flour. Methods for determination of gluten quantity and quality.
GOST 28795-90 (ISO 5530-4-83)	Wheat flour. Physical characteristics of doughs. Determination of rheological properties using an alveograph.
GOST 28796-90 (ISO 5531-78)	Determination of raw gluten content.
GOST 29138-91	Wheat vitaminized flour, bread and baked products. Method for vitamin B_1 (tiamin) determination.
GOST 29139-91	Wheat vitaminized flour, bread and baked products. Method for vitamin B_2 (rhyboflavin) determination.
GOST 29140-91	Wheat vitaminized flour, bread and baked products. Method for vitamin PP (nicotinic acid) determination.
GOST 30090-93	Sacks and fabric for bads. General specifications.
GOST 30178-96	Raw material and food-stuffs. Atomic absorption method for determination of toxic elements.
GOST 30483-97	Grain. Methods for determination of general and fractional content of extraneous matter and damaged grains; content of small grains and grain size; content of grains attacked by pests; content of metallic particles.
GOST P 51116-97 (registered in the RoK)	Compound feeds, grain and grain by-products. Method for determination of desoxinivalenol (vomitoxin) content.
GOST P 51301-99 (registered in the RoK)	Food-stuffs and food raw materials. Anodic stripping voltammetric methods of toxic traces elements determination (cadmium, lead, copper and zinc).

3 Terms and definitions

The terms and definitions therein are used according to [1]

4 Classification

4.1. Based on the grade of the raw material used the fortified wheat bread flour is subdivided into:

- fortified wheat bread flour of the first grade;
- fortified wheat bread flour of the high grade.

4.2.The other grades of the flour processed as required by the regulatory documents approved in accordance with the established procedure, may be subject to fortification.

5 Technical requirements

5.1 The fortified flour shall comply with the requirements of this standard and be processed as per the Regulations [2] and applicable addendums thereto, approved in accordance with the procedure established in the Republic of Kazakhstan.

5.2 The fortification shall be carried out through adding to and mixing of premix and pre-mixture containing concentrated vitamins and minerals, with the flour.

Concentration and ratio of vitamins and mineral nutrients in premix and pre-mixture allowed for use and rates of introduction into formula, prepared and approved in accordance with ST RK 1081, when adding them in the flour shall provide the specified rate of ingredient content in the end product – the fortified wheat bread flour.

5.3 Wheat as the raw material for the fortified flour when delivering to the mills for processing shall comply with the requirements of GOST 9353. The requirements to the wheat delivered for milling shall comply with the requirements of GOST 26574 given in Table 1.

Table 1 – Requirements to the wheat delivered for milling

Name of grain indicator	Rate, %, no more
Content of barley, rye grain, as well as sprouted grains	
of these crops and wheat (per totally) including:	5,0
sprouted grains	3,0
corncockle	ОД
toxic impurities	0,05
including Russian centaury and coronilla (per totally)	0,04

The end of Table 1.

Admixture of seeds of heliotropium dasycarpum and Trichodesma incanum	Not allowed
Note – Content of sprouted grains is determined according to the results of analysis of the grain prior to cleaning.	

5.4 The requirements to organoleptic and physicochemical indicators of the fortified wheat bread flour are given in Table 2.

Table 2 - The requirements to organoleptic and physicochemical indicators of the fortified flour

Namy of indicator	Characteristic and rate	
	High	First
Colour	White or buttery white	White or off-white
Taste	Typical taste of the wheat flour, without off-flavour, not acid, not bitter	
Odour	Typical odor of the wheat flour, without off-odour, not sour [1)]	
Moisture content, %, no more	15,5	
Mineral admixture presence	When masticating the crunch shall not be found	
Metal foreign matter, mg per 1 kg of flour; with size of certain particles in the maximum linear dimension 0,3 mm and (or) mass not more than 0,4 mg, no more	3,0 [2)]	
Pest infestation	Not allowed	
Pest filth	Not allowed	
1) Slight odour of vitamins and additives is allowed in the fortified wheat bread flour. 2) Without considering the elemental electrolytic iron added at fortification (isolated from the whole metal foreign matter of the sample through the particle-size analysis). Note – the moisture content of the wheat bread flour intended for long-term storage shall not be more than 14,5 %.		

5.5 The fortified wheat bread flour shall comply with the quality requirements given in Table 3.

Table 3 Requirements to the fortified wheat bread flour

Wheat grade	Weight content of ash calculated as solid, %, no more	Whiteness, cond.units of РЗ-БГТЛ apparatus, not less	Weight content of raw gluten, %, not less	Quality of raw gluten, cond.units of IDC apparatus	Grinding coarseness, %		Falling number "FN", s, not less
					Sieve residue according to GOST 4403, no more	Undersize according to GOST 4403	
high	0,55	54,0	28,0	Not lower than the second group	5 of silk fabric No.43 or polyamide fabric No.45/50 ПА		185
first	0,75	36,0	30,0	Not lower than the second group	2 of silk fabric No35 or polyamide fabric No.36/40 ПА	No less than 80,0 of silk fabric No.43 or polyamide fabric No.45/50 ПА	185

Notes

1 Wheat "whiteness" indicator is applicable instead of "ash" indicator at the enterprises equipped with the laboratory instruments and apparatus according to GOST 26361.

2 "Falling number" indicator – FN shall be determined according to GOST 27676, upon the request of a purchaser.

3 The other sieves with equivalent screening capacity are allowed to be used for determination of the particle size.

5.6 Fortified premix or pre-mixture used upon production of wheat bread flour shall comply with applicable regulatory documents agreed and approved in the prescribed manner; shall have a quality document and formulation of application (application rate) by varieties of wheat bread flour to be fortified.

Quality certification shall contain actual mass content of vitamins and microelements in a mass unit, maximum allowable useful life of premix or pre-mixture for flour fortification.

5.7 Vitamins and microelements added to the flour upon fortification together with natural background content of these elements in fortified flour upon the external control in accredited assessment and certification laboratories (centers), the authorized body for technical regulation and metrology shall comply with a list and standards indicated in the attachment A.

5.8 Vitamins and microelements added to the flour upon fortification shall be controlled in the production process in accordance with formulation regulating the added mass of premix or pre-mixture per mass unit of fortified flour flow.

5.9 Content of toxic elements mycotoxins, pesticides, radionuclides and value of microbiological indicators in wheat bread fortified flour shall not exceed allowable levels indicated in [3].

Levels of microbiological indicators of wheat bread fortified flour according to [3] are indicated in the Table 4.

Table 4 – Microbiological Indicators of Fortified Flour

Name of indicator	Rate
OMAFAnM, CFU/g, max	5×10^4
Mold, CFU/g, max	100
B.subtilis, CFU/g, max	1×10^3
Potato disease agent contamination, mg/kg	1×10^3

5.10 Upon flour production for export, list of vitamins and minerals for fortification, application rates shall be stipulated by terms and conditions of supply agreements and may be accompanied by indication of marking and name of standard or other regulatory document of importing country.

5.11 Packing

5.11.1 Flour packing – according to GOST 26791.

5.11.2 Bags according to GOST 30090.

5.11.3 Deviation of net weight – according to ST RK 2.34, [4].

5.12 Marking

5.12.1 Marking of wheat bread fortified flour – according to GOST 26791 and ST RK 1010 with additions according to paragraph 5.12.2 in the official and Russian languages.

5.12.2 For wheat bread fortified flour, packing shall contain:

- a word “fortified” in large print;
- standard logotype of fortified products approved in the prescribed manner [5];
- registered trade name of premix or pre-mixture (if any) used upon flour fortification, and regulatory documents for its production;
- name of manufacturer, its location;
- net weight, kg;
- date of production and shelf life;
- composition and quantitative content of fortifiers in flour (Attachment A);
- nutrition and energy value (Attachment B);
- information on certification;
- legends “Keep in cool, dry place away from direct sunlight”, “Made in the Republic of Kazakhstan” or “Made in Kazakhstan”;
- applicable standard.

Marking details shall be indicted on label and on single and (or) grouped container of fortified flour, fully or selectively.

5.12.3 The following shall be indicated on label together with mandatory marking details:

- legend “Recommended by the Ministry of Health of the Republic of Kazakhstan as healthy nutrition product”;
- promotional content on manufacturer and product properties.

5.12.4 Bulk wheat bread fortified flour in retail trade network shall be sold with supporting information for consumers as product inserts and (or) posters with compulsory marking details and required explanatory information on product properties and may contain promotional materials on manufacturer. Product inserts shall be issued by manufacturer of products upon release of finished products upon the request of trade firm for retail sales.

6. Acceptance procedure

6.1 Acceptance procedure shall be according to GOST 27668. Selected samples shall be kept away from direct bright light, heating devices or high humidity. Flour shall meet all requirements of the present standard for corresponding variety.

6.2 Wheat bread fortified flour quality standard document shall contain a word "fortified", type of fortifiers, application rate and control (indicator) ingredient in premix for fortification used upon the internal control and product certification.

Certification tests of wheat bread fortified flour shall be conducted according to paragraphs 5.4 and 5.5, tests for determination of fortified element availability and content – according to paragraph 5.7 for iron only as a control (indicator) ingredient of premix or pre-mixture added for flour fortification. If iron level in fortified production flour complies with statutory indicator (Attachment A) and applicable document on premix or pre-mixture quality is available, content of all other fortifiers shall be deemed as complying with application rates used.

6.3 Control and control periodicity of toxic elements, pesticides, mycotoxins, radionuclides and microbiological indicators in wheat bread fortified flour shall be conducted in accordance with a procedure prescribed by public authority in the field of sanitary epidemiological welfare of population of the Republic of Kazakhstan.

6.4 Instrumental quality control of all vitamins and minerals added to flour shall be conducted one a year in test laboratories (centers) accredited in the prescribed manner. Samples selected from well established, stably operating technological line of flour fortification shall be used for control procedure.

Mean sample with weight 500 g min shall be used for instrumental control procedure by combining and thoroughly mixing random samples selected every 2 hours during one shift min.

6.5 Arbitration analysis upon any discrepancies in the assessment of quality shall be made in centers or test laboratories accredited in the prescribed manner after commission selection according to paragraph 6.4 of this standard or after sampling from batches of fortified flour produced within 24 hours in 12 sampling points evenly distributed in this batch.

7. Control methods

7.1 Sampling and sample preparation shall be made according to GOST 27668 and paragraphs 6.4 and 6.5 of this standard.

7.2 Organoleptic indicators shall be determined according to GOST 27558.

If any discrepancies in organoleptic indicators (taste, odor, content of mineral impurities) will arise upon the assessment of flour quality, they shall be determined by degustation of bread made of this flour.

7.3 Content of hazardous impurities, germinated grains and rye and barley impurities in wheat shall be determined according to GOST 30483 (upon grain acceptance).

7.4 Mass content of humidity in flour shall be determined according to GOST 9404.

7.5 Flour granularity shall be determined according to GOST 27560.

7.6 Mass content of ash in flour shall be determined according to GOST 27494.

7.7 Quantity and quality of gluten shall be determined according to ST RK 1054 and GOST 27839; raw gluten for export shall be determined according to GOST 28796 (ISO 5531);

7.8 Flour color shall be determined according to GOST 26361.

7.9 Falling number in flour shall be determined according to GOST 27676.

7.10 Metal foreign matter shall be determined according to GOST 20239.

7.11 Pest contamination and infestation of flour shall be determined according to GOST 27559.

7.12 Flour acidity shall be determined according to GOST 27493.

7.13 Volume yield of bread, shape stability and organoleptic indicators of bread shall be determined according to GOST 27669.

7.14 Toxic elements for sample preparation shall be determined according to GOST 26929, GOST 26927, GOST 26930, GOST 26932, GOST 26933, GOST 30178, GOST P 51301 and according to methods approved in the prescribed manner by authorities of public health and metrology of the Republic of Kazakhstan.

7.15 Microbiological indicators shall be determined according to GOST 10444.2, GOST 10444.5 and according to methods approved in the prescribed manner.

7.16 Content of mycotoxins shall be determined according to GOST P 51116-97 and [6, 7], pesticides according to [8, 9] and radionuclides shall be determined according to methods stated for Cesium-37 in [10] and for Strontium-90 in [11] and according to methods approved and accepted in the prescribed manner.

7.17 Mass content of fortifiers (vitamins, iron and zinc) in fortified flour shall be determined according to GOST 29138, GOST 29139, GOST 29140, GOST 26928, GOST 26934 and according to methods approved in the prescribed manner.

7.18 Flour acidity, autolytic activity and physical test characteristics shall be determined according to GOST 27493, GOST 27495 and GOST 28795.

7.19 Other indicators may be determined upon the request of the customer, if methods for their determination are standardized. In all cases, requests to determine these indicators shall be entered into supply agreements at the date of their conclusion.

8. Transportation and storage

8.1 Transportation and storage shall be according to GOST 26791.

8.2 Flour shall be transported by vehicles with standard technical passport issued by public authority for sanitary and epidemiological control.

8.2 Wheat bread fortified flour shall be stored at natural temperature and relative humidity away from direct sunlight, in dry, clean, well ventilated warehouses not contaminated by grain pests. Wheat bread fortified flour shall be stored in compliance with sanitary epidemiological rules and norms and requirements to the storage of cereal products approved in the prescriber manner.

8.3 Storage conditions of wheat bread fortified flour shall be determined by properties of fortifier ingredients and in case of any specific requirements, the latter shall be indicated on label and package of flour.

8.4 Warranty period of storage of wheat bread fortified flour in compliance with storage conditions of paragraphs 8.1 and 8.2, at ambient temperature +25°C max and relative air humidity 70% max shall be 6 months max from the date of production.

9. Manufacturer's warranty

Manufacturer shall guarantee the compliance of wheat bread fortified flour with the requirements of the present standard while observing storage period and conditions, sales, transportation and use in accordance with its designated purpose.

Upon the expiry of warranty period, decision on the intended use of this flour shall be made by public sanitary epidemiological authorities.

Attachment A
(compulsory)

Content of vitamins and microelements in fortified flour of high and first grade
(background content included)

Name of indicator	Content, mg/kg
Vitamins:	
B_1 (thiamine)	1.8 – 3.6
B_2 (riboflavin)	1.4 – 3.2
PP (nicotinic acid)	16.0 – 30.0
B_c (folic acid)	1.0 – 1.8
Microelements:	
Fe (iron)	45.0 – 65.0
Zn (Zinc)	20.0 – 30.0

Attachment B
(reference)

Nutrition and energy value of wheat bread fortified flour by varieties (per 100 g of product)

Flour variety	Proteins, g	Fats, g	Carbohydrates, g	Energy value, kcal
High grade flour	10.3	1.1	68.9	334
First grade flour	10.6	1.3	67.6	331

Attachment
(reference)

Bibliography

[1] Procedure for fortification of food products subject to sanitary epidemiological control has been approved by the resolution of the Government of the Republic of Kazakhstan No.32 of 19 January 2008.
[2] Procedure for organization and conducting of technological process in milling plants approved by the State Committee of Council of Ministers of USSR on Food and Procurements of 01.02.1991, M. 1991.
[3] Sanitary Rules and Regulations 4.01.071.03 "Hygienic Requirements to Safety and Nutrition Value of Food Products" approved by the order of the Minister of Health of the Republic of Kazakhstan No.447 of 11 June 2003.
[4] Methods of state metrological control approved by the order of the Committee of Technical Regulation and Metrology No.498 of 15.112006;
[5] Certificate of trademark of Intellectual Property Committee of the Ministry of Justice of the Republic of Kazakhstan No.16162 of 12.12.2004 to the goods of class 30 according to International Certification of Goods and Services (flour, pastries, iodized table salt).
[6] Instruction book, methodology guidelines and other statutory documents used in sanitary hygienic laboratories of Sanitary and Epidemiological Inspectorate, Volume 1, Computer Center "Viola", Alma-Ata, 2000.
[7] Methodology guidelines 10.05.002.97 for detection, identification and determination of T-2 toxin content in food products and food ingredients, Principal Sanitary and Epidemiological Department of the Ministry of Health of USSR, M, 1984.
[8] Methods for determination of trace quantity of pesticides in food products, feed, external environment. Reference book, Volume 1, M.A. Klissenko, A.A. Kalinina. K.F. Novikova, M, "Kolos", 1992 (approved by the Ministry of Health of USSR in 1992).
[9] Methods for determination of trace quantity of pesticides in food products, feed, external environment. Reference book, Volume 2, M, "Agropromizdat", 1992 (approved by the Ministry of Health of USSR in 1992).
[10] Methods for the assessment of radionuclide activity using gamma-ray scintillation spectrometer based on software "Progress", "NPP Dosa, NPP Gamma", Mendeleevo, 2003 (registered in Kazakhstan Institute of Metrology No.07.00.00303-2004).

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For notes