




Ministry of Health and Medical Industry of Turkmenistan



Wheat Flour Fortification in Turkmenistan and its Legal Framework

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Disease prevention is one of the core items of today's healthcare organization system in our country which aims at mitigation of social and economic damage inflicted by various diseases, improvement of public health, increase in life expectancy.

Addressing the micronutrient deficiencies is a key priority to the Government of Turkmenistan and an important contribution to preservation and improvement of public health, especially women's and children's health, and to achievement of the Sustainable Development Goals (SDGs).

In this context, certain laws and regulations have been passed and dedicated state-run programs have been implemented.



Turkmenistan's basic laws, regulations and guidelines for flour fortification using folic acid and iron are as follows:

- Certification Law of Turkmenistan (2013)
- Food Security Law of Turkmenistan (2014)
- Public Healthcare Law of Turkmenistan (2015)
- Saglyk Presidential State-Run Program (2015)

- Resolution of the President of Turkmenistan “Regarding Salt Iodination and Flour Fortification with Iron” (1996)
- Resolution of the President of Turkmenistan “Regarding Folic Acid-Fortified and Iron-Fortified Flour Production” (2006)
- National Healthy Public Nutrition Program of Turkmenistan for 2013-2017 (2013)
- National Strategy for 2014-2020 Action Plan on Ashgabat Declaration on the Prevention and Control of Noncommunicable Diseases in Turkmenistan as approved by Resolution of the President of Turkmenistan (2014)

- Technical Standard TŞ00018160-10-2006 “Iron-Fortified and Folic Acid-Fortified Premium and First Grade Bread Flour. Technical Standards”
- Folic Acid-Fortified and Iron-Fortified Flour Quality Ongoing External Monitoring Instructions
- Instructions on Flour Fortification Monitoring (Control) at the Türkmen Galla Önümleri State Association Mills
- Iron-Fortified and Folic Acid-Fortified Premium and First Grade Bread Flour Production Instructions for the Türkmen Galla Önümleri State Association Mills

As recommended by international organizations, World Health Organization, UNICEF in Turkmenistan, flour enrichment with micronutrients is mandatory for all premium and first grade flour produced in the country

Quantity and composition of micronutrients added to the enriched food have been determined with involvement of international UNICEF experts based on the existing data provided in food balance tables subject to the following wheat flour consumption: **>300** g/day, 150-300 g/day, 75-150 g/day and <75 g/day

Averaged nutrient volumes added to fortified wheat flour – by flour extraction, fortifying compound and estimated flour consumption (WHO/NMH/NHD/MNM/09.1)

| Nutrient | Flour extraction | Compound | Volume of nutrients added, in parts per million (ppm), on an estimated average daily per capita flour consumption basis (g/day) | | | |
|------------|------------------|---------------------|---------------------------------------------------------------------------------------------------------------------------------|-----------------|---------------|-----------|
| | | | <75 g/day | 75-149 g/day | 150-300 g/day | 300 g/day |
| Iron | Low | NaFeEDTA | 40 | 40 | 20 | 15 |
| | | Ferrous sulfate | 60 | 60 | 30 | 20 |
| | | Ferrous fumarate | 60 | 60 | 30 | 20 |
| | | Electrolytic iron | HP ³ | HP ³ | 60 | 40 |
| | High | NaFeEDTA | 40 | 40 | 20 | 15 |
| Folic acid | Low or high | Folic acid | 5.0 | 2.6 | 1.3 | 1.0 |
| Vitamin B | Low or high | Cyanocobalamin | 0.04 | 0.02 | 0.01 | 0.008 |
| Vitamin A | Low or high | Vitamin A palmitate | 5.9 | 3 | 1.5 | 1 |
| Zinc | Low | Zinc oxide | 95 | 55 | 40 | 30 |
| | High | Zinc oxide | 100 | 100 | 80 | 70 |

Premix composition adopted in Turkmenistan addable to premium and first grade flour

| Ingredients | Content, per cent |
|-----------------------------------------------------------------------|--------------------------|
| Dried ferrous sulphate | 42 |
| Folic acid (USP, BP) | 0.75 |
| Inert aggregates (wheat and corn starch, calcium sulphate) | 57.25 |

In Turkmenistan, the following premium and first grade flour enrichment rates have been established pursuant to Technical Standard TŞ 00018160-10-2006:

| Item description | Per flour grade characteristics and rate | |
|-------------------------------------------------------------------------------------|------------------------------------------|-------------|
| | Premium grade | First grade |
| Premix added, g/t ¹ | 190 | 150 |
| Ferrous sulfate added, g/t ² | 78 | 62.5 |
| Folic acid added, g/t ² | 1.5 | 1.2 |
| Weight fraction of iron in fortified wheat flour, mg/kg of flour ³ | 32±12 | 32±12 |
| Weight fraction of folic acid in fortified wheat flour, mg/kg of flour ⁴ | 1.5±0.3 | 1.2±0.2 |

In 2008, a long-term Memorandum on Iron and Folic Acid (Premix) Procurement was entered into between the Türkmen Galla Önümleri State Association and UNICEF to facilitate an efficient, long-range and sustainable implementation of the iron deficiency anemia prevention program.

In 2016, upon reorganization of the Türkmen Galla Önümleri State Association, the Memorandum was re-executed by its successor, Ministry of Agriculture and Water Industry of Turkmenistan.

In accordance with the Memorandum, the State procures, through UNICEF Procurement Services, high quality iron and folic acid (premix) independently and in a financially stable and regular manner



As a result of successful implementation of noncommunicable diseases prevention activities through enrichment of premium and first grade flour, Turkmenistan was solemnly presented an award for its leadership in the flour fortification cause during the 2011 Eurasian Conference and Exhibition of the International Association of Operative Millers (IAOM)



Internal Monitoring is carried out on-site using spot testing and colorimetric method

UNUŇ DEMIRE bolan damja barlagy boýunça instruksiýa Hil barlagy (demir tegmilleriniň bardygyny anyklamak üçin barlag)

Müňkindikler

- Fertifitselenen unuň düzüminde demirniň bardygyny barada hil barlagyny geçirmek üçin ulanylýar.

Geçirmekligiň düwürleýinligi:

- Her bir önümlüňlik çalyşmasynyň başynda we soňunda (zetur bolan ýagdaýynda her 4 sagatdan)

Barlagyň mawzuzy

- Unuň nusgalary önümlüňlik çyzygyndan we çykysda alynýar (küpöňç hallatlara çekilip gaplanmazdyndan öň, ýeňle hem amnarda çykylyp gaplanan önümden alynan nusgalary ulanmak mümkin däl)

- Nusgalyklary saýlamakda jogapkärler – degirmenliň başlygy we laboratoriyanyň başlygy

- Damja barlaglaryny geçirmek boýunça jogapkär – degirmen laboratoriyasynyň işgärleri (barlamçylar)

Reaktivler

- Reaktivler we erginler her gün gaýnadylyp arassalanan suwda täýýarlanylýar
- 10% KSCN: 100 ml suwda
- HCl ergini – 2M: 100 ml suw, 17 ml konsentritlenen HCl soň ýene 83 ml suw – jemi 200 ml. Ergin
- Kaliý tiosinatyň we dur kislotasynyň ergininiň reaktiwi (THIOCYANATE/HCl): KSCN ergini bilen HCl erginleriniň deň möçberini gaýydyrýň – 2M edili ulanmazdan önüsyýasy – (reaktiw 1)
- H2O2 (wodorodnyň ötürýüsi) 3% : gaýnadylyp arassalanan suwda – (reaktiw 2)
- Reaktivler we erginler plastik gapda saklanmaly, saýkyn ýerde, ýygtylykdan daşda. Reaktivleri goshmak üçin plastik pipetkalary ulanmak gowy hasaplanýar.

Инструкция по спот-тесту МУКИ НА ЖЕЛЕЗО Качественная проба (проба на наличие вкраплений железа)

Возможности

- Применяется для качественного анализа муки на содержание железа в фортифицированной муке

Периодичность проведения:

- В начале и в конце каждой производственной смены (при необходимости каждые 4 часа)

Предмет анализа

- Образцы муки берутся с производственной линии и на выходе (чаще до расфасовки и мешки, но возможно также использование образцов из расфасованной продукции со склада)

- Ответственные за отборы проб – начальники мельницы и начальник лаборатории (ПТЛ)

- Ответственный за выполнение Спот тестов – персонал лаборатории мельницы (лаборанты)

Реактивы

- Реактивы и растворы готовятся на дистиллированной воде ежедневно
- 10% KSCN: в 100 мл воды
- Раствор HCl – 2M: 100 мл воды, 17 мл концентрированной HCl и затем еще 83 мл воды – в сумме 200 мл раствора
- Реактив смеси тиюсидат калия – солевой кислоты (THIOCYANATE/HCl): смешайте равные объемы раствора KSCN и раствор HCl – 2M непосредственно перед использованием – (реактив 1)
- H2O2 (перекись водорода) 3% : дистиллированной воде – (реактив 2)
- Реактивы и растворы должны храниться в пластиковой таре, в прохладном месте, вдали от света. Желательно использовать пластиковые пипетки для добавления реактивов

Иşiň gidişi / Процедура

Undan taklis üst täýýarlaň. Unuň nusgalarynyň we onuň ýanynda belli ülini (30 ppm, 60 ppm) ýerleşdirň. Unda çukurlyk ýasaň.



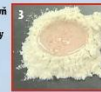
Приготовьте плоскую поверхность из муки. Разместите пробу муки и известный стандарт (30 ppm, 60 ppm) рядом. Сделайте лунку в муке.

Onuň üstine kaliý tiosinat reaktiwiňi (THIOCYANATE/HCl) 6-8 damjasyňy damdyrýň. 15-30 sekunda çenli goryň.



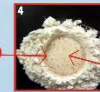
Нанесите 6-8 капель реактива тиоцианата калия (THIOCYANATE/HCl) на поверхность. Оставьте на 15 – 30 секунд.

Wodorodnyň ötürýüsiniň 6-8 damjasyňy goryň. Ötürýüsi hemişe ü çäkli tertipde goshulmaly. Birnäçe minut garaşyň.



Добавьте 6-8 капель перекиси водорода. Перенос всегды должна добавляться в последнюю очередь. Подождите несколько минут.

Gyzyl tegmiller peýda bolup başlaýar. Deneýdriň netijeleri belli üliniň bilen (30ppm, 60ppm)



Появляются красные пятна. Сравните результаты с известным стандартом (30ppm, 60ppm)

Demir goshulmazdan

30 ppm

50 ppm

Düzüminde dürli konsentrasiaýaly demirleriň bar bolmagynyň düşündirilýişiniň mysaly



Без добавки железа

30 ppm


50 ppm

Пример интерпретации содержания железа различных концентраций



External Monitoring is the principal control mechanism during production, storage and realization of wheat flour enriched with folic acid and iron


External Monitoring allows to assess whether folic acid-fortified and iron-fortified flour quality meets relevant standards, consumption by population and to review efficiency of the program




Ongoing external monitoring is carried out by subordinated authorities of the State Public Health Service of the Ministry of Healthcare and Medical Industry of Turkmenistan in accordance with the Folic Acid-Fortified and Iron-Fortified Flour Quality Ongoing External Monitoring Instructions

Furthermore, monitoring results are duly reported and reviewed on a monthly basis





The following are where state sanitary control and monitoring may be carried out using laboratory tests:

- all domestic flour mills;
 - warehouses and retail facilities, regardless of ownership form;
 - canteens and warehouses at schools and child care centers;
 - canteens and warehouses at sanatoria and hospitals;
 - canteens and warehouses at seasonal children's recreational institutions;
 - households
- 

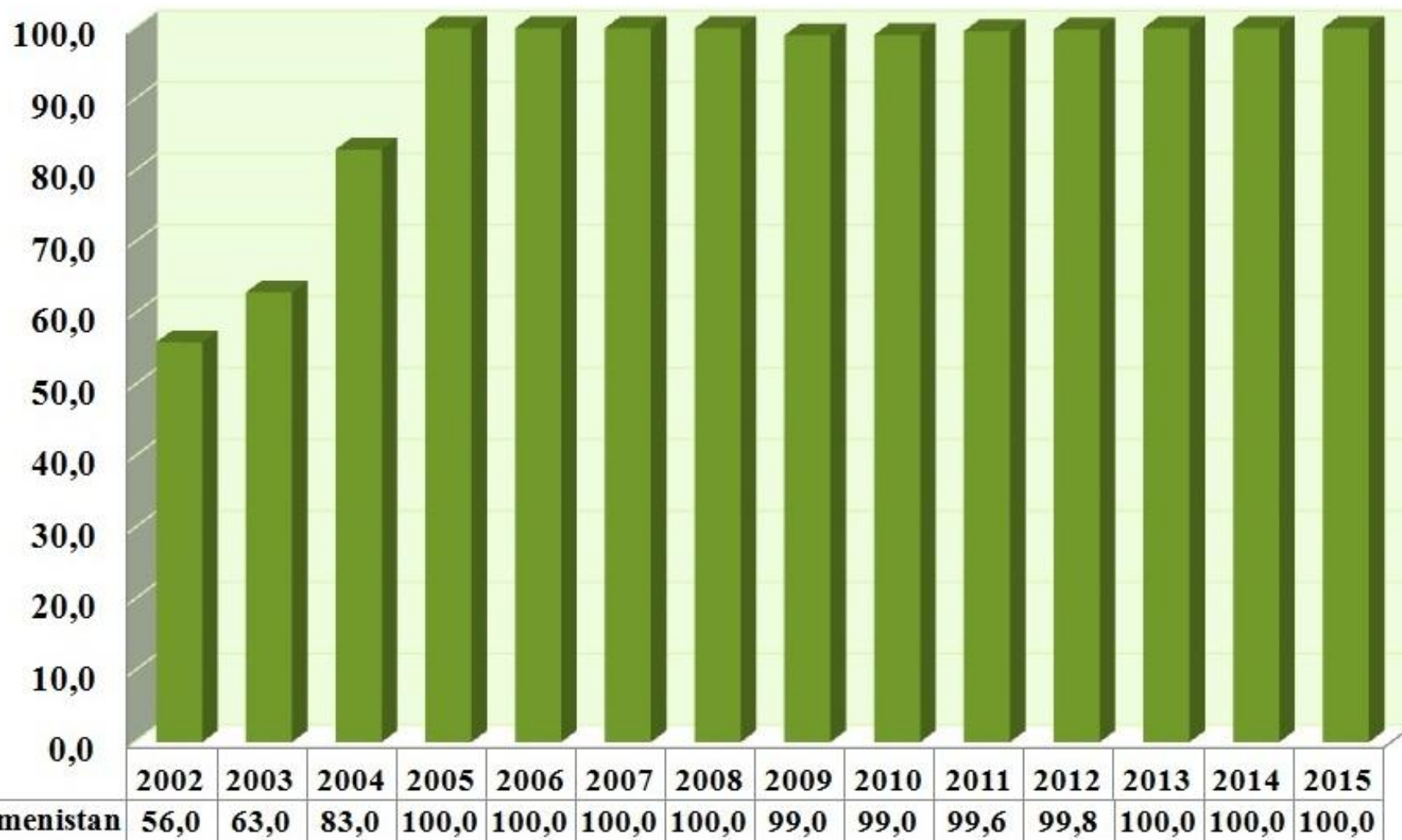
Laboratory tests of folic acid-fortified and iron-fortified flour samples taken during external monitoring activities are carried out in the following quantities and with the following frequency

| Territory | Laboratory test method | sampling place and quantity of samples | Sampling frequency |
|----------------------------------------------------|----------------------------------------------|-----------------------------------------------------------------------------------------------------------------|---------------------------|
| Public Health Services of cities, towns and etraps | Express Iron Spot Test | Flour mills, retail facilities, public eating facilities, child care centers, healthcare facilities, households | Monthly |
| Public Health Services of velayats | Spectrophotometric method under TDS-26928-90 | 10 samples from each city, town, etrap | Quarterly |
| Public Health and Nutrition Center | Spectrophotometric quantification methods | 10% of samples received by velayats from cities, towns and etraps | Quarterly |

Presently, all premium and first grade flour produced in Turkmenistan is fortified with iron and folic acid which constitutes in the total 2015 flour produce as follows:

Premium grade (20.4%);
First grade (73.3%);
Second grade (4.3%);
Macaroni flour (2%)

Comparative volumes of wheat flour fortified with a vitamin mineral complex during 2002-2015



Further Steps

Review of proposals and projects of the Second Technical Meeting on Harmonization of Wheat Flour Fortification Standards

Technical and economic assessment for harmonization of low extraction (refined, white) wheat flour fortification standards

Improvement of wheat flour enrichment monitoring and control system

Enhancement of quality control methods and system



Thank you for attention!