



BRIEFING NOTES

FORTIFICATION OF WHEAT FLOUR IN INDONESIA

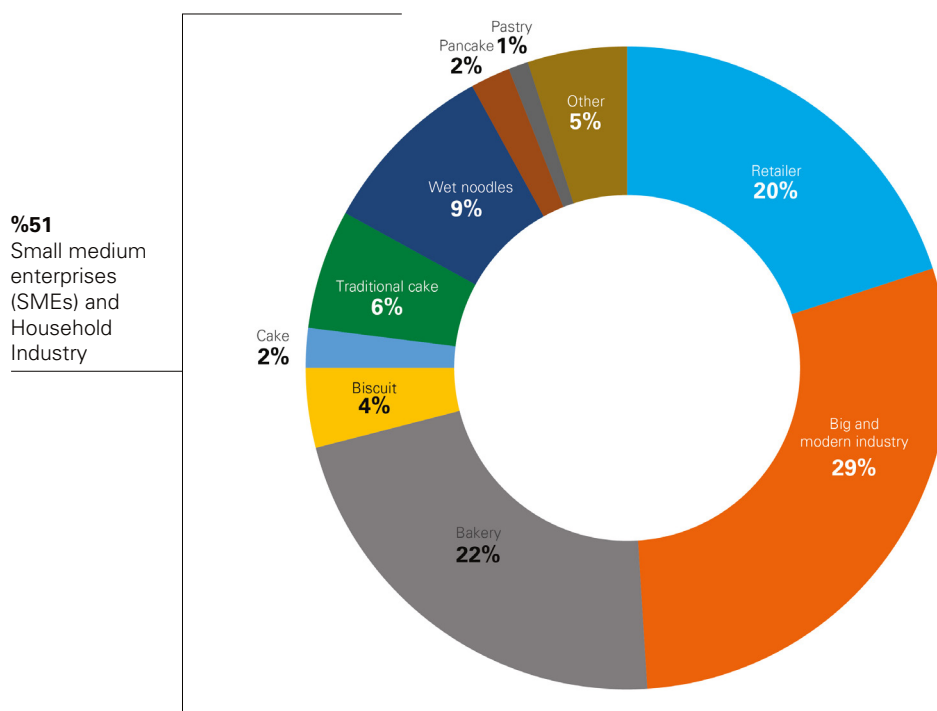


National Requirements and Consumption Patterns for Wheat Flour

Products made from wheat flour, in particular noodles and breads, are the second staple food of Indonesians after rice. Wheat flour consumption is growing nationally but is higher in urban communities and in higher income households meaning that it is not the optimal food vehicle for reaching those most vitamin and mineral deficient. However, wheat flour fortification is easy, cost-effective and highly effectuations amongst the people who consume it. Although wheat flour consumption is growing and wheat flour is the second staple food in Indonesia after rice, consumption is low compared to many European, Middle Eastern and some African countries.

While Indonesia's national requirements for wheat flour are all met from domestic mills, all wheat grain is imported into Indonesia. In 2022, Indonesia imported 9.5 million metric tons of wheat to make 6.661 million metric tons of wheat flour.¹ This translates to per capita consumption of wheat flour of 66 gram/capita/day (g/c/d) assuming everyone eats wheat flour or 89 g/c/d assuming only adults over 14 years old consume wheat flour. Only 20% of wheat flour is sold as retail flour for food preparation in the home. The rest is made into wheat flour products by small scale enterprise (51%) or large industry (29%). Common wheat flour foods in Indonesia are dry noodles, in particular instant noodles, bread and bakery product, wet noodles, traditional cakes and biscuits. In general, these products are made by both large and small industries, but instant noodles are made almost exclusively by large industries, while, traditional cakes and wet noodles are made almost exclusively by small industries.

Figure 1: Wheat flour consumers²



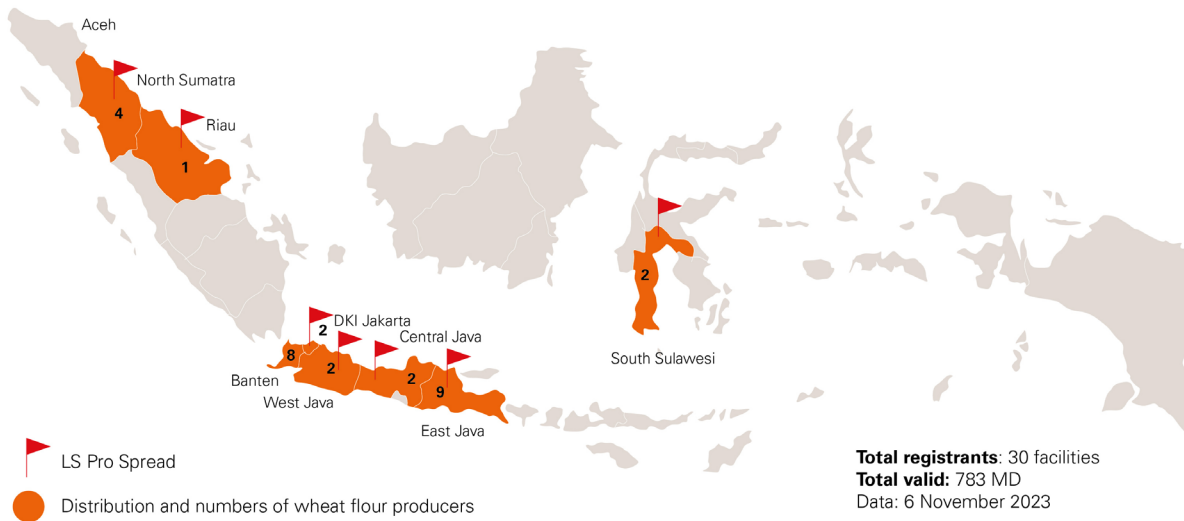
Structure of the Wheat Flour Milling Industry

Indonesia's entire wheat flour supply is milled from imported wheat grain. The imported wheat grain is milled in 30 mills belonging to 22 companies. Twenty-four of the 30 mills are members of APTINDO (Wheat Flour Millers Association/ Asosiasi Produsen Tepung Terigu Indonesia), the wheat miller's association; they represent 99.5% of wheat flour market share. The number of mills has risen exponentially from just 5 mills in 1998.

¹ APTINDO, September 2023.

² APTINDO, September 2023.

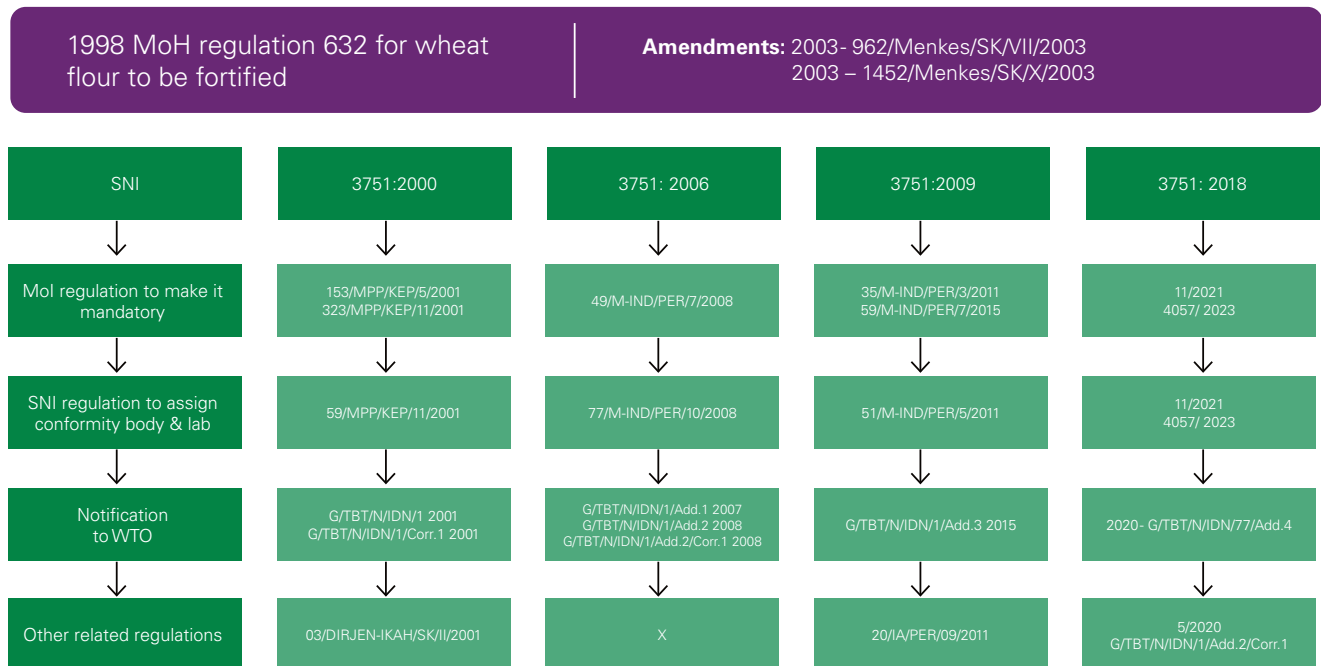
Figure 2: Distribution of BPOM (National Agency of Drug and Food Control)-Registered Wheat Flour Mills³



Legislation, Regulations and Standard for Wheat Flour Fortification

Since 2000, the national standard (Standar Nasional Indonesia/ SNI) for wheat flour has included fortification requirements. The standards were made mandatory and a conformity body was assigned by Ministry of Industry regulations. The fortification of wheat flour in Indonesia has therefore been mandatory since 2001. The standards were updated in 2006, 2009 and 2018. All were made mandatory and a conformity body assigned. World Trade Organization (WTO) was also informed. The fortification requirement applies to both packaged and bulk flour (i.e. flour that goes to the processed food industry), domestically produced and imported. The legislative framework for wheat flour fortification is the most comprehensive, straightforward and clear of all the mandatorily fortified foods and as such could be a model for LSFF legislation going forward.

Figure 3: Legislative framework for mandatory wheat flour fortification



Related regulations are concerned with relaxation of fortification requirements during the Covid pandemic

3 BPOM presentation at Focus Group Discussion on Monitoring and Evaluation of the Implementation of Monitoring the 2023 Fortified Food Policy, 19 December 2023

The standards were updated in 2018 and became effective in 2021, following the issuance of World Health Organization (WHO) recommendations on wheat flour fortification in 2009⁴ with the objective of making wheat flour fortification more efficacious. Taking into consideration average wheat flour consumption in Indonesia, the WHO recommendations suggest higher levels of all micronutrients than are currently required and that only selected, more bio-available iron compounds are permitted. The 2018 update of the standards, which was initiated by a letter from the Ministry of Health (MoH), and was coordinated by the Bureau of National Standards (BSN) specify that only the WHO-recommended iron compounds (sodium ethylenediaminetetraacetic acid/ NaEDTA, ferrous fumarate and ferrous sulphate) are allowed but did not increase the level of any of the micronutrients. The Landscape Analysis was not able to get a full explanation of why the nutrient levels were not increased. It is important to recognize that in light of the relatively low levels of wheat flour consumption in Indonesia, higher levels of micronutrients are needed in order to effectively increase micronutrient status. While wheat flour fortification is more efficacious now because of the more bioavailable iron compounds, it may not be as effective as it could be because of lower than recommended micronutrient levels.

Sustainable and Profitable Production of Fortified Wheat Flour

Indonesian wheat flour mills are large and sophisticated with adequate expertise and resources to make quality fortified flour. Indonesian mills also operate within a global wheat flour milling community in which fortification is the norm; 92 out of 196 (47%) countries currently have legislation for mandatory wheat flour fortification.⁵ Poor quality fortification is thus unlikely to be related to poor capacity or inadequate resources.

Rather, recent fortification concerns from the milling industry have been in relation to impacts of fortification on organoleptic properties of final products. In particular the recent switch from using electrolytic iron as the iron compound to ferrous fumarate, revealed that in the presence of borax, some steamed or boiled products, such as wonton skin and chicken noodles, developed black spots. This was due to an interaction between the ferrous fumarate and the borax and was not caused by the ferrous fumarate itself. The black spots were not found during organoleptic trials conducted in preparation for changing the iron compound and has only been reported in Mongolia, and no other countries in the region with mandatory wheat flour fortification. The solution is to use alternative additives rather than borax, which is in any case prohibited under Indonesian food safety regulations.

Regulatory Monitoring for Enforcement of Compliance for Wheat Flour Fortification

Regulatory monitoring for wheat flour fortification is undertaken primarily by the National Agency of Drug and Food Control (BPOM) at both production and market level. BPOM results indicate that 83% of registered wheat flour mills have a published 'good manufacturing practices (CPPOB) certificate – this is more than either salt or palm cooking oil refineries. Market surveillance indicates that more than 80% of samples collected met fortification requirements in recent years. While high, this percentage is actually slightly lower than for either cooking oil or consumption salt. This 'low' result could possibly be because wheat flour is fortified with multiple micronutrients with some added in very small quantities; it is possible that some laboratory tests are unable to detect the low levels of some of the nutrients, such as folic acid or vitamin B1.

Coverage and Impact of Fortified Wheat Flour

No data exists on the coverage of fortified wheat flour in Indonesia. Additionally, the impact of wheat flour fortification has not been demonstrated; specifically, wheat flour fortification does not appear to have contributed to a reduction in anaemia. The prevalence of anaemia may not have been reduced by wheat flour fortification because there are multiple causes of anaemia and wheat flour fortification can only impact upon anaemia caused by iron or folic acid deficiency. Additionally, the contribution of wheat flour consumption to iron intake may be limited by the use of a less bio-available form of iron – electrolytic iron – before the standard was updated and came into effect in 2021.

4 World Health Organization, FAO, UNICEF, GAIN, MI, & FFI. Recommendations on wheat and maize flour fortification. Meeting Report: Interim Consensus Statement. Geneva, World Health Organization. 2009

5 Global Fortification Data Exchange. Fortification Legislation. Accessed 13/11/2023. [<https://fortificationdata.org/interactive-map-fortification-legislation/>]



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Coordination, Management and Oversight of Wheat Flour Fortification

There is no coordination structure for wheat flour fortification or palm cooking oil, as there has been for salt fortification at various times since salt iodization was mandated. However, the wheat miller's association, APTINDO, has greatly facilitated coordination on wheat flour fortification, such as by representing the industry in negotiations on updating the standard. And while political commitment for large scale food fortification is generally high, wheat flour fortification has been officially suspended by the government on two occasions; once in 2008 when fortification was blamed for price increases in wheat flour and a second time in 2020 due to reported difficulty in obtaining premix during Covid. However, neither of these suspensions appear to have been justified and may indicate occasions of inadequate political commitment for wheat flour fortification.

Recommendations on Improving the Implementation of Wheat Flour Fortification

Cross-cutting Recommendations (i.e. apply to all fortification commodities and not just wheat flour)	Wheat flour-specific Recommendations
Coordination, Management and Oversight	
<ul style="list-style-type: none"> » Commission a series of focus group discussions and review of relevant regulations to map roles and responsibilities of various ministries, directorates within ministries and other relevant government agencies. The objective of the review is to identify gaps and overlaps in roles and responsibilities and to ensure alignment in the principals of government support to and implementation of fortification. Use the results to increase the accountability of stakeholders to fulfil their agreed upon mandates and roles with regards to fortification. » Through the Forum ensure that fortification is considered in the development of any food related policies that might influence the implementation or effectiveness of fortification. » Develop consensus on the role of sub-national government in mandatory food fortification, in particular in relation to support to industry, regulatory monitoring and communication to consumers. 	<ul style="list-style-type: none"> » There are no recommendations on coordination, management and oversight that are specific to wheat flour only.

Legislation, Regulations and Standards

- » Commission a review of food fortification legislation in the context of Indonesia's food legislative system. The objectives would be to look for opportunities for simplification and standardization in order to strengthen the legislative framework and facilitate implementation. For example, review the necessity to issue new regulations to make an SNI mandatory and to assign an enforcement body every time it is updated and standardize the content of such regulations across fortified foods. Revoke "additional regulations" on mandatory fortification to avoid duplication and contradictions in regulations outside of the 'SNI and supportive regulations' model. Consider the wheat flour legislative framework as an example of how other mandatory fortification foods can be legislated.
- » Review fortification requirements for wheat flour. Consider updating 3751:2018 to increase fortification levels in order to increase the effectiveness of fortification; specifically increase iron, folic acid and zinc levels in SNI 3751. Potential advantages in making these updates need to weigh against the long process to amend SNIs.

Regulatory Monitoring

- » Commission a review of all components of regulatory monitoring for food fortification to document the various components since there are different implementors, and look for ways to streamline and simplify the process in line with recommendations from the 2017 WHO/FAO Review of the Food Control System.⁶ In particular, assess options for developing a more integrated food control system to reduce the number of monitoring activities and duplication between BPOM and MoI and reduce the burden on industry. The fact that LSPro has been authorized by both BPOM and MoI potentially creates opportunities for greater integration.
- » Develop a system to monitor use of fortified food in the manufacture of processed foods in order to enforce national requirements for the use of fortified ingredients in such products. This could be achieved by simply verifying through document auditing that fortified versions of wheat flour have been ordered and delivered, e.g., by review of CoA of the wheat flour.
- » Undertake a cost benefit analysis on testing wheat flour samples for the level of one or two 'marker nutrients' rather than all nutrients in the wheat flour premix, in addition to verifying premix quality and composition through document audits.

Assessment of Coverage and Impact

- » Create a working group or taskforce within the Food Fortification Forum that is responsible for seeking/keeping an eye out for opportunities to assess indicators relevant to fortification through planned data collection exercises such as surveillance systems and national surveys.
- » Use the Forum to improve understanding amongst food fortification stakeholders on ways to assess the coverage and evaluate the impact of LSFF, including identifying optimal indicators and understanding how to interpret results.
- » Improve the understanding of the limitations of anaemia as an indicator of wheat flour fortification.
- » Develop a methodology to evaluate the impact of wheat flour fortification using the new SNI. This may need to be a controlled trial comparing a population consuming wheat flour fortified as per the previous SNI compared the current SNI, a literature review on the evidence for impact of electrolytic iron vs ferrous fumarate or an assessment of iron status in a population now that all wheat flour is made with ferrous fumarate. The final option has the disadvantage of not having a comparison group but it could potentially demonstrate that the population has adequate iron status that might be attributable to fortification with ferrous fumarate. This evaluation is being requested by the wheat flour millers as they want 'proof' that flour fortification is now effective. However, as levels of iron, zinc and folic acid are all lower than recommended for Indonesia's current level of wheat flour consumption, it is possible that an evaluation will not find the programme to be effective, despite the fact that ferrous fumarate is now being used.



In 2023 BAPPENAS commissioned a landscape analysis on large-scale food fortification in Indonesia. The landscape analysis reviewed the status of the fortification of salt, wheat flour, palm cooking oil and rice and identified gaps and challenges in implementation. This fact sheet summarizes the findings on the implementation of wheat flour fortification.



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