



The growing consumption of bread and baked goods in Indonesia

■ AN OPPORTUNITY FOR AUSTRALIAN WHEAT

Purpose

AEGIC exists to increase value in the Australian grains industry.

Glossary

AEGIC	Australian Export Grains Innovation Centre
AH	Australian Hard (a class of Australian wheat)
APH	Australian Prime Hard (a class of Australian wheat)
APW	Australian Premium White (a class of Australian wheat)
ASFT	Australian Soft (a class of Australian wheat)
ASW	Australian Standard White (a class of Australian wheat)
CWRS	Canadian Western Red Spring (a class of Canadian wheat)
DNS	Dark Northern Spring (a class of USA wheat)
ha	Hectare
HRW	Hard Red Winter (a class of USA wheat)
IDR	Indonesia Rupiah
kcal	Kilocalorie
kg	Kilogram
NTD	No-time dough
RD	Rapid dough
RSP	Retail sale price
SME	Small to medium-sized enterprise
SD	Sponge and dough (baking)
SWOT	Strengths, Weaknesses, Opportunities, Threats
USA	United States of America
WW	Western White (a class of USA wheat)

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Summary

The largest wheat end product segment in Indonesia is currently instant noodles, followed by bread and baked products. Almost twice as much wheat is used to support instant noodle consumption compared to bread consumption. Towards 2030, the higher growth rate in consumption of bread and baked products will lessen the volume gap between instant noodles and these other products. By 2030, only 30 per cent more wheat will be used for instant noodles compared to bread and baked goods.

Indonesia's per capita consumption of bread is growing strongly, which represents a large source of additional demand for imported wheat. Indonesia's population and per capita income are both increasing, fuelling the import of increasing volumes of wheat for its bread and baked goods sector. The Australian share of the Indonesian bread market remains relatively small, with around 0.11mmt used annually (or less than 3% of Australian wheat exports to Indonesia).

Due to the popularity of 'sponge & dough' (SD) baking in Indonesia, mostly in the large-scale industrial bakeries, the bread market in Indonesia remains dominated by North American grades. Canadian Western Red Spring (CWRS) and to a lesser extent, Dark Northern Spring (DNS) are viewed as 'benchmarks' by millers. Australia does not presently offer a grade that competes directly against these North American grades, as high-protein Australian wheat has historically been targeted towards Asian noodles, which require distinctly different functional traits. Bread, and particularly SD bread, requires higher protein wheat with comparatively strong dough – neither of which are competitive strengths of current Australian wheat grades.

While existing Australian bulk grades do not perform like North American wheat in SD baking, there are two possible ways forward. Firstly, while Australia does not currently provide a CWRS-like bulk grade, there are individual varieties grown that either match or exceed the baking performance of North American equivalents. It is also likely that some unreleased crosses are similar to DNS quality and these could be drawn upon if a bread-focused bulk grade was to be established. The second more feasible pathway is to continue to encourage Indonesian end-users to further adopt rapid dough (RD) baking methodologies which are better suited to relatively extensible Australian hard wheats. Some of the popular sweet baked goods and breads manufactured in small-to-medium bakeries use mid and lower protein wheat, which Australia already produces, in reasonable quantities.

The principal challenge facing Australia, should it choose to pursue supply of high protein wheats, will be its ability to reliably produce sufficient quantities with the protein levels and functionalities required. There is no impediment to Australia breeding improved wheat varieties suitable for these Indonesian end users. However, Australia's climate variability and water-limiting conditions are likely to inhibit its ability to be a reliable and affordable supplier of adequate volumes of such wheat. There are other baked goods, such as cakes and cookies, and some styles of bread that either require or can include a higher proportion of the kinds of mid or lower protein wheats already widely produced in Australia.

Over the next decade, there is no market segment anywhere else in Indonesia, or even further afield in neighbouring Asian markets, that comes close to offering as much volume and margin upside as Indonesia's bread and baked goods market. Australia's ability to profit from participating in that market growth requires careful consideration by Australia's wheat industry.

Recommendations

- 1 Growing the use of Australian wheat in small-to-medium-sized Indonesian bakeries is an opportunity for Australia in the short to medium term

More than two-thirds of Indonesian bread and baked goods are produced by small-to-medium-sized enterprises (SMEs). These bakeries can use flour blends which incorporate mid-protein wheat, which Australia already produces.

- 2 Large-scale industrial bakeries are a longer-term opportunity for Australian wheat

This segment is dominated by North American wheat. Australia currently does not have a competitive advantage in this segment. In the longer term, Australian industry could breed high protein baking wheats with competitive yields and functionalities suited to some bread flour blends in Indonesia. These varieties need to be commercially attractive to many farmers over a wide geographical area to ensure Australia becomes a more reliable and attractive supplier to Indonesian customers. The commercial viability of growing reliable quantities of high protein bread wheats will require a co-ordinated approach between growers, breeders, WQA (Wheat Quality Australia), logistics and marketers.

- 3 Overall, the Australian industry should target market segments most likely to use Australian wheat

The relative attractiveness of the Indonesian bread and baked goods market needs to be compared against opportunities in other market segments and geographic markets. Resources required for breeding and market development are finite, while markets and market segments with likely upside are numerous. The Indonesian bakery segment is multi-faceted, so care is required to target segments most likely to include Australian wheat in their flours.

- 4 Ongoing technical engagement and education is needed to support Australian wheat in the Indonesian bread and baked goods market

Technical support and collaborative activities between the Australian grains industry and end-users form a key part of the value proposition for Australian wheat. In scenarios where the industry wishes to claim new market share, in a segment where end-users are unfamiliar with the product-specific properties of Australian wheat, technical support becomes critical.



Key findings

Bread consumption is growing

Per capita wheat consumption for bread in Indonesia is around 4.7kg per year and is forecast to grow to 6.6kg by 2030. An additional 0.8mmt of imported wheat for bread will be required by 2030. By contrast, per capita wheat consumption for instant noodles has plateaued at around 8kg per year and remains a dominant source of wheat demand.

Baked goods are premium foods

Compared to instant noodles, bread and other baked goods are mostly premium snacks eaten for pleasure rather than satiety. Wheat for some of these end uses has greater scope for premiumisation.

Most baked goods are produced by smaller bakeries

More than two-thirds of baked goods in Indonesia are produced by small, traditional, family-owned enterprises and similar SMEs. A further 11% is produced by small boutique bakeries. Large-scale industrial bakeries produce the remaining 19% of Indonesia's baked goods.

'Bread' has a broad definition

Most Australians perceive bread as pan bread or loaf bread. In Indonesia a wider array of products, often containing sugar and fat, are labelled and viewed as bread.

High protein wheat is preferred

Bread-making, especially by large-scale industrial bakeries, uses higher protein wheat with comparatively strong dough — neither of which are a comparative advantage for Australian wheat. Some popular sweet baked goods and breads manufactured by SMEs can use lower protein wheat, which Australia already produces in large quantities.

North American wheat dominates

The bread market in Indonesia, especially in large-scale industrial bakeries, is dominated by North American grades, with DNS and CWRS considered the benchmarks by millers. Australia does not presently offer a grade that competes directly against DNS and CWRS.

North American wheat commands premium prices

DNS and CWRS classes attract a premium of generally between USD\$20/t and USD\$40/t over Australian Hard (AH) wheat on a delivered basis.

Baked goods are an opportunity for Australian wheat

Supply of functionally attractive wheat from Australia will help Indonesia to diversify its sources of wheat for the bread and baked goods segment. This will add to Australia's reputation as a supplier of functional wheat for use in a range of wheat products. Australia can also diversify its exposure to different market segments.

Australian wheat is a good blending option

Australia's potential to profit from serving Indonesia's bread and baked goods sector is likely to be as a component of premium bread flour blends, due to the relatively affordable functionality of suitable Australian wheat classes.







Key Facts and Figures

Indonesia's Bread Market

Consumption

The largest wheat end product segment in Indonesia is currently instant noodles, followed by bread products. Almost twice as much wheat is used to support instant noodle consumption compared to bread consumption. Towards 2030, however, the higher growth rate in consumption of bread products will lessen the wheat use gap between instant noodles and bread, with only 30 per cent more wheat being used for instant noodles compared to bread (Table 1).

Table 1. Share of wheat demand, volume of wheat demand, and wheat demand per head by product, forecast to 2030

		2019: ESTIMATED Wheat for food			2030: FORECAST Wheat for food		
		(%)	mmt	kg/hd	(%)	mmt	kg/hd
	Instant noodles	36%	2.2	8.3	32%	2.6	8.4
	Other noodles	11%	0.7	2.6	14%	1.1	3.6
	Bread	21%	1.3	4.7	25%	2.0	6.6
	Cakes and biscuits	15%	0.9	3.4	12%	1.0	3.3
	Home use	15%	0.9	3.4	12%	1.0	3.3
		Total wheat use			Total wheat use		
TOTAL FOOD		62%	6.2	22.9	62%	7.9	26.0
	FEED AND OTHER	38%	3.8	14.1	38%	4.9	15.9

Source: (OECD – consumption and share by segment, AEGIC – product share estimates as at September 2019)

Market share

The Australian share of the Indonesian bread market is small relative to Canada, with the current volume of Australian grain used to make bread estimated at 0.11mmt annually (Figure 1).

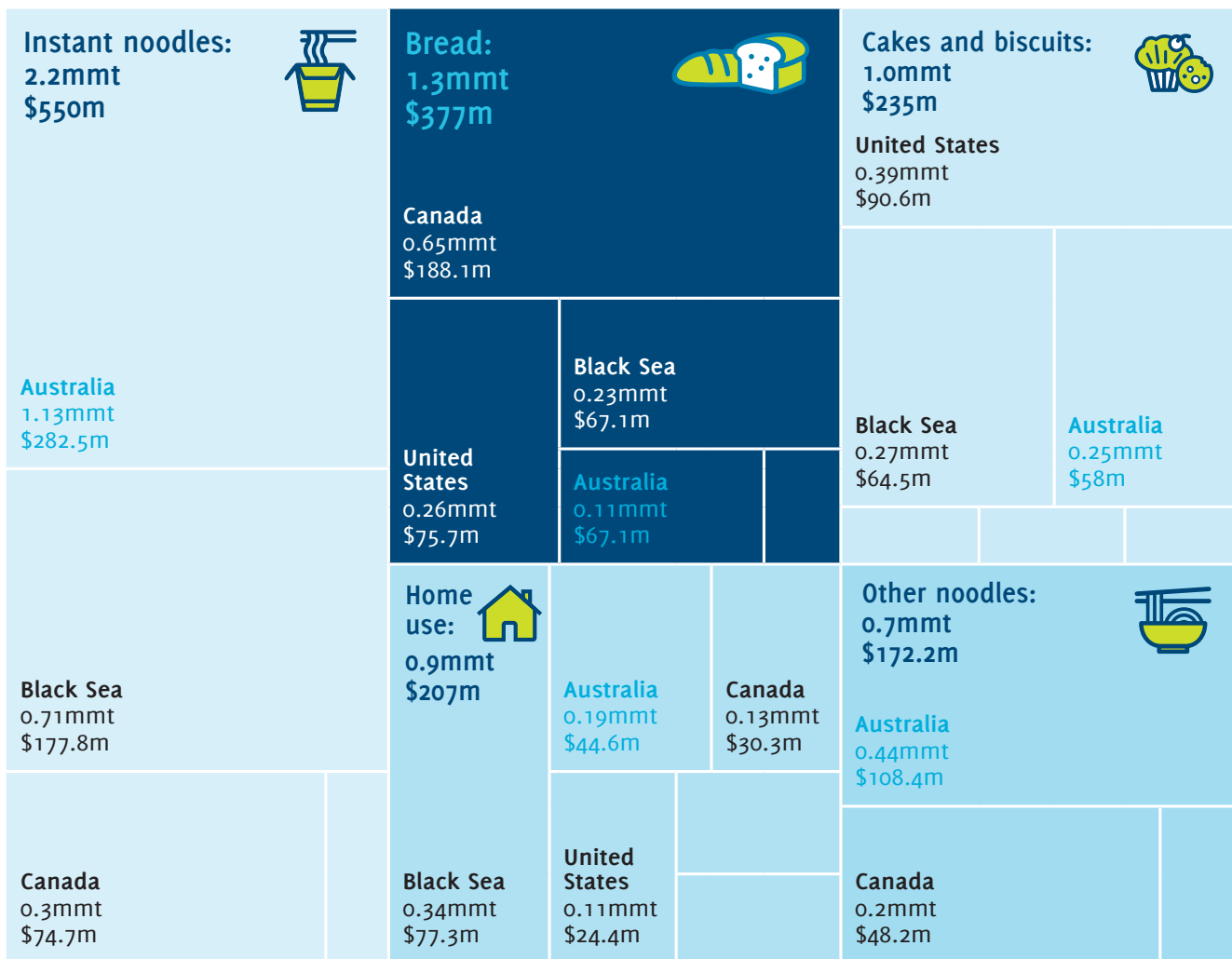


Figure 1
Estimated breakdown of the volume and value of wheat used in Indonesian food products, by wheat origin, for 2019

Source: AEGIC

Population

Indonesia's population has increased from 200 million in 1995 and is expected to reach 300 million by 2035 (Figure 2).

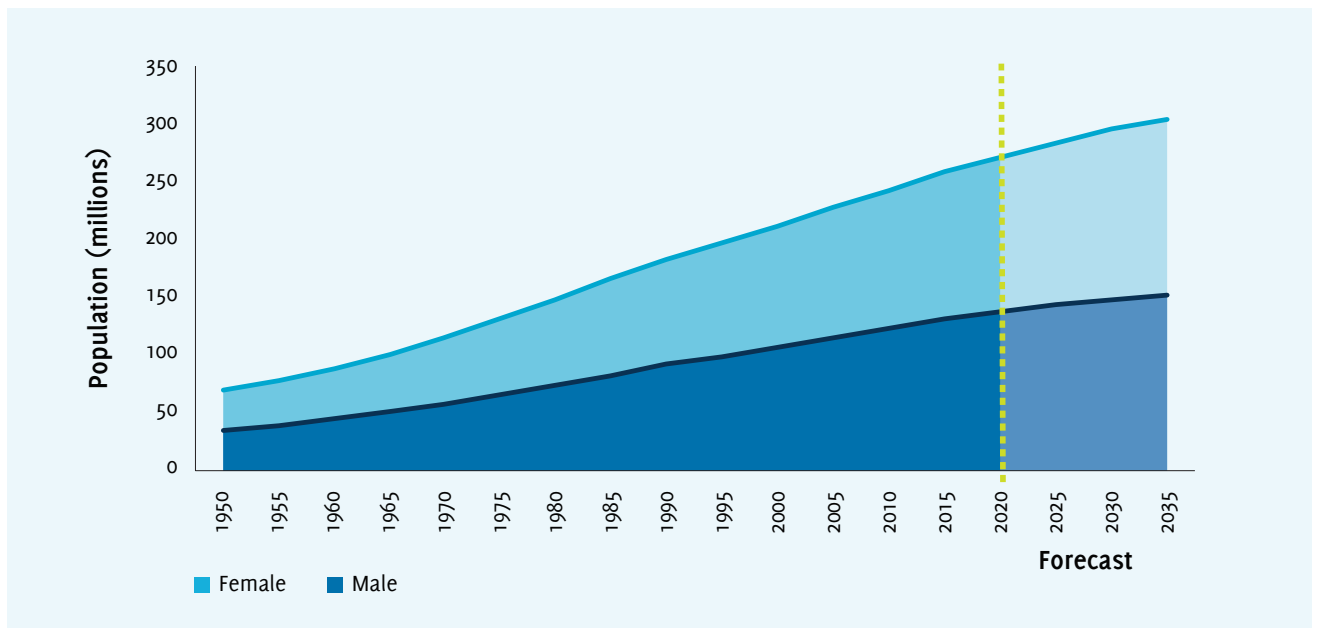


Figure 2
Indonesian population, 1950-2035



Introduction



This report is the third in a series focused on Indonesia — Australia’s largest wheat market, located to our immediate north. The first report (*The Indonesian Wheat Market — Its strategic importance to Australia*) provided a general overview, while the second report (*The Indonesian Noodle Market — Its importance to Australian wheat exports*) focused on the market for noodles, which has absorbed more Australian wheat exports than any other global market. Both reports indicated that the growing consumption of various wheat-based foods in Indonesia is attributable to three factors — rising disposable incomes, urbanisation and national food security.

This third report focuses on Indonesian consumption of bread, bread products and baked goods. The scope of this report thus covers a wide range of food products, from sandwich bread through to the various sweet, baked treats that are becoming increasingly popular as Indonesia urbanises and increases its per capita wealth. This wide range of products draws on a wide range of flour types, and therefore, various wheat grades. As a rule of thumb, bread and bread-like food products typically require relatively high-protein wheat, while many of the sweet baked goods use a range of wheat classes, from mid-protein wheat through to low-protein soft wheat.

Most Australians perceive bread as pan bread or loaf bread. However, a wider array of products, often containing sugar and fat, are labelled and viewed as bread in Indonesia. This is a key difference between the bread market in Australia and Indonesia.

Indonesian breads come in a wide variety of styles and shapes and often have substantial inclusions of sugar and fat that is uncommon in Australia. Fortunately for Australian wheat, the range of bread types in Indonesia does allow some variety of flour mixes to be used, depending on the bread type and the method of bread-making.

Some global context regarding bread consumption is useful to note. Bread is an historically important staple food across much of the Western world, with more than 100mmt consumed globally each year (Figure 3).

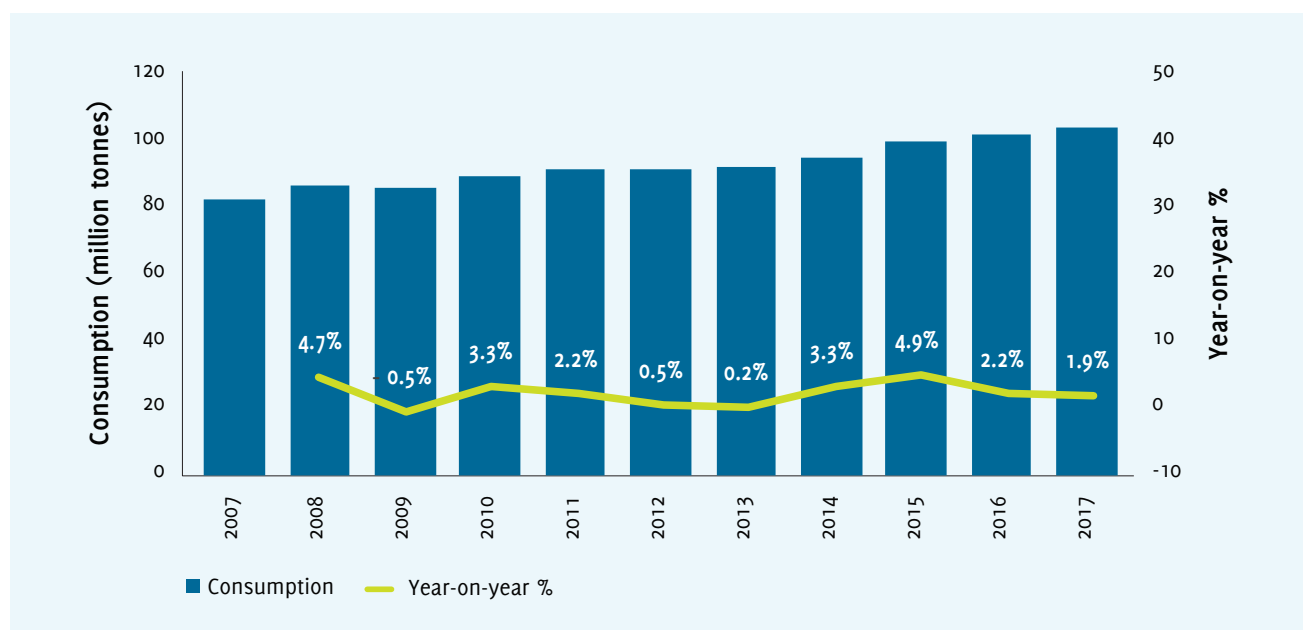


Figure 3
The volume (mmt) and annual growth (%) of the global bread market, 2007–2017

Note: : YoY is year on year percentage change

Consumption is dominated by the USA, Russia, UK and Germany. Perhaps less well-known is that China, principally due to the size of its population, is the world's second-largest bread consumer, accounting for around 10% of global bread consumption. As a group, all these countries account for nearly half of global consumption (Figure 4).

While bread consumption is a relatively saturated mature market in many Western countries, bread consumption in many Asian countries like Indonesia is in its infancy. However, due to the prospect of population increase, consumption in Asia (and further out, Africa) is an emerging source of future consumption growth.

IndexBox has forecast global bread consumption to grow to 117mmt per annum by 2025 (Figure 5) representing an annual growth of 1.6%. Much of this increase comes from countries like Indonesia, who have young and increasingly urbanised consumers developing a taste for Western-style bakery foods such as bread, cakes and cookies. This growth in consumption of bread will mostly occur in Asia and will require an extra 14mmt of wheat to be produced by 2025.

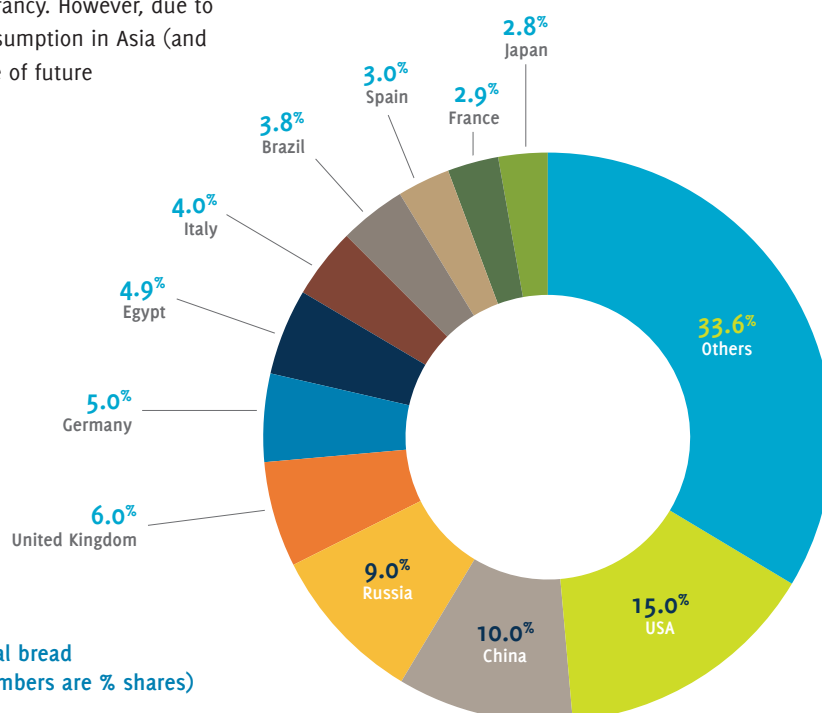


Figure 4
Countries' shares of global bread consumption in 2017 (Numbers are % shares)

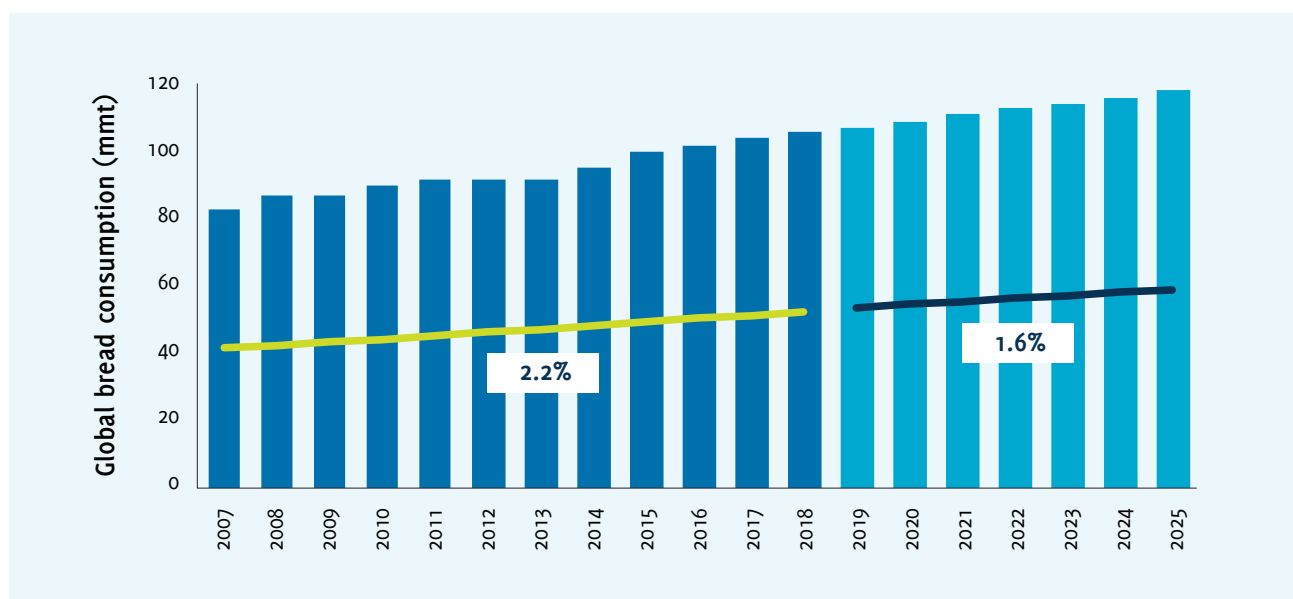


Figure 5
Global bread consumption (mmt) and annual growth (%), actual and projected, from 2007 to 2025

Indonesia is already a globally important importer of wheat, principally used in noodle production. However, Indonesia's future bread and baked goods consumption will benefit from a potent combination of population growth plus per capita consumption growth.

In general, the type of wheat required for making bread is different from the types of wheat required to make noodles, cakes and biscuits. Hence, over the next decade, due to the stronger rate of growth in consumption of bread and baked goods in Indonesia, the profile of Indonesia's wheat imports will change. For example, there will be a gradual decline in the

relative importance of wheats required for instant noodles as per capita consumption of noodles has plateaued (Kingwell *et al.*, 2019). In addition, as 2030 approaches, the nature of Australia's interaction with the Indonesian market is likely to change, with the growth in Indonesian wheat demand (~2.1mmt) likely to outstrip growth in the exportable surplus of Australian wheat (Kingwell, 2019b).

In this AEGIC report we explore the nature of Indonesia's bread and baked goods sector and examine the opportunities it might present for Australia's wheat industry.



Background – changing demographics and bread consumption

When an individual's income is enough to safeguard their daily caloric requirements, then their diet becomes less focused on survival and more on provision of experiences. Taste and novelty become increasingly important drivers of consumer behaviour. The consumption of bread in Indonesia reflects this phenomenon.

The historical carbohydrate staple for Indonesia is rice not bread. As an equatorial tropical country, Indonesia does not produce wheat. Instead it grows rice and rice remains its main food staple. In Indonesia, bread is a novelty rather than a staple. Indonesia's young, urban and emergent middle and upper classes consume bread as a snack, usually a sweet treat from a bakery.

Indonesia's bread market is growing strongly, as indicated by retail sales growth (Table 2). In the future, Indonesia's population growth and its per capita income growth (Kingwell et al., 2018) will further fuel the consumption of bread and bakery goods. Bread-based foods, such as sandwiches, will increase as a proportion of total calories consumed by the average Indonesian. A major driver of this will be dietary change where bread consumption alters from being a 'sometimes snack' (see Appendix) to a more commonplace option that complements the ongoing dominance of rice and instant noodles.

Table 2
Bread consumption in Indonesia: 2013–2018

	Unit	2013	2014	2015	2016	2017	2018	2013-18 Growth
Total volume	'000 tonnes	473	500	526	553	576	599	27%
Retail value	IDR billion	4,649	5,151	5,538	5,954	6,260	6,557	41%

Source: Euromonitor (based on sales in main retail outlets)

Note: Other important sources of purchases of bread and bakery products are not included in this table



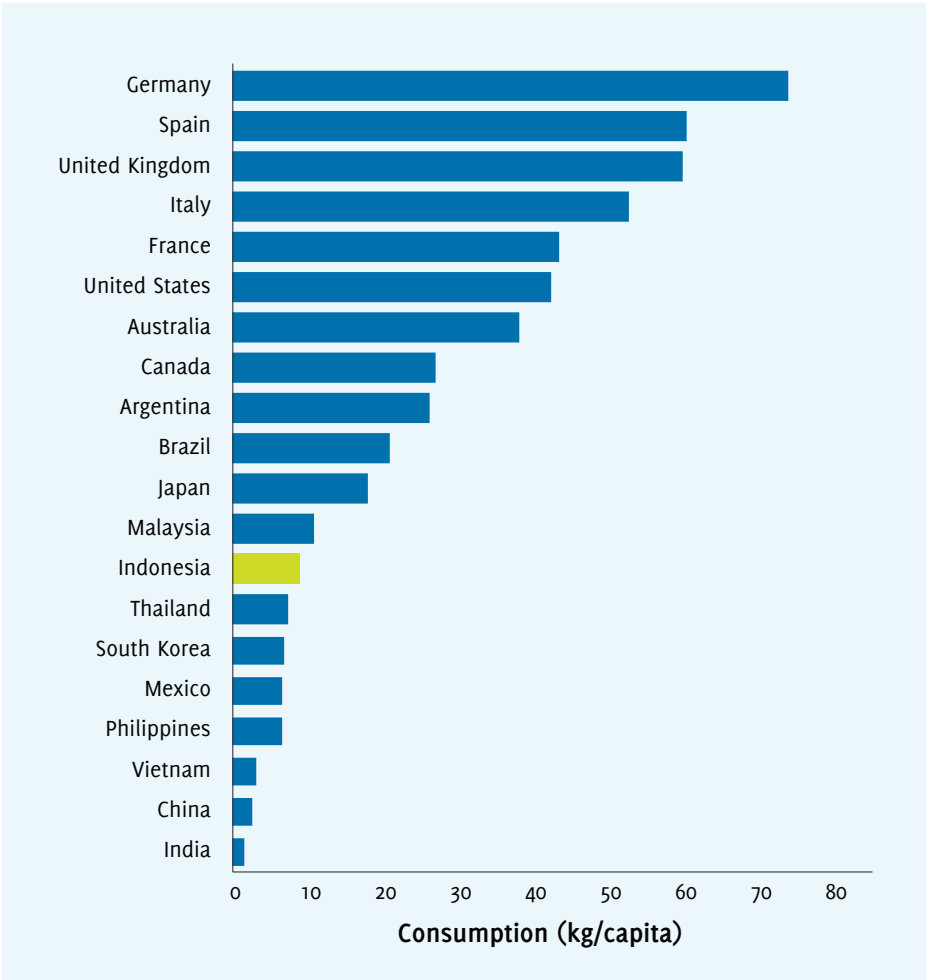
Urbanisation in Indonesia is associated with a gradual dietary shift away from a largely rice-centric diet to one where calories are added from other sources, especially wheat-based noodles. Indonesia is now the second-largest instant noodle market in the world (behind China). While instant noodles often are marginally cheaper than rice, the consumption of noodles is not solely due to their affordability but also due to their convenience. Busy office workers in urban areas prefer to consume noodles due to their convenience and affordability.

If Indonesian diets continue to duplicate the dietary shifts already observed over the last two or more decades in the more developed Asian economies, like Malaysia and Japan, then sizeable growth in consumption of bread and bakery products is likely. This growth will be fuelled by both per capita increases in consumption and a rising population. A modest per capita growth in coming decades of only 5kg per person in Indonesia eventually would require import of around 15mmt of wheat for the Indonesian bread and bakery products sector.

There are a range of estimates of Indonesia’s per capita consumption of bread and baked goods. For example, Statista (2019) estimates the average per capita annual consumption of bread and bakery products in a broad range of countries, including Indonesia. They estimate Indonesia’s per capita consumption of bread and bakery products is ~9kg (Figure 6). AEGIC suggests a slightly lower figure for the bread and bakery segment, estimating current bread consumption in Indonesia of around 4.7kg (in wheat equivalents), with per capita consumption of other baked goods of ~3.8kg, totalling a lower combined figure of 8.5kg.

Figure 6
Per capita annual consumption of bread and bakery products for various countries in 2018

Source: Statista 2019





The market for bread and bread products in Indonesia

Indonesia's bread market – main players and market share

A major difference between the bakery sector, the instant noodle sector and flour milling in Indonesia is the degree of relative market fragmentation. Instant noodle and flour production can be characterised as quasi-oligopolies, with overall market share concentrated in a handful of individual players and their dominant retail brands. By contrast, more than two-thirds of baked goods in Indonesia are produced by small, traditional, family-owned enterprises and similar SMEs. A further 11% is produced by small boutique bakeries. Lastly, at present, large-scale, industrial enterprises such as Sari Roti and their competitors (Table 3) have a 19% market. These large retail

brands, like Sari Roti and MyRoti, are expected to claim a larger market share in the future.

As Indonesia's overall retail sector continues to modernise and move further towards the 'supermarket and convenience store' model, greater concentration of market share in the larger, industrialised players is expected. These larger businesses have the required scale and supply chain infrastructure to meet the requirements of this channel. This trend is relevant for any Australian wheat exports aiming to claim a share of this market. The processes used to produce, store and distribute bread can influence the functional traits required of the wheat – right down to the ambient temperature and humidity levels in the bakery.

Table 3
Indonesian bread and baked goods market – main players overview

Company	Market Share	Annual Sales	Market Capacity	Main Retail Brand	Ownership
Traditional SMEs	68.0%				
Boutique Bakeries	11.2%			BreadTalk Holland Bakery	
<ul style="list-style-type: none"> PT. BreadTalk Indonesia PT. Mustika Cita Rasa others 					
PT. Nippon Indosari Corpindo Tbk.	18.8%	Year 2018:	10 plants in Indonesia (4.06 million pieces per day) 1 plant in Philippines	Sari Roti BonChef	PT. Indoritel Makmur Internasional Tbk; Bonlight Investment Limited; Demeter Indo Investment Pte. Ltd (KKR & Co.L.P); Pasco Shikishima Corporation; and Public investors
<ul style="list-style-type: none"> PT. Prima Top Boga Sarimonde Foods Corporation PT. Mitra New Grain 		<ul style="list-style-type: none"> Bread (Rp. 1.510 billion) Sweet Bread/Buns (Rp. 845.3 billion) Cakes (Rp. 93.14 billion) Philippines (Rp. 10.99 billion) 			
PT. Swanish Boga Industria		n.p.		Swanish	
PT. Yamazaki Indonesia		n.p.		MyRoti	
PT. Multi Star Rukun Abadi		n.p.		Sharon	
PT. Sriboga Bakeries Integra		n.p.		Le Gitt	

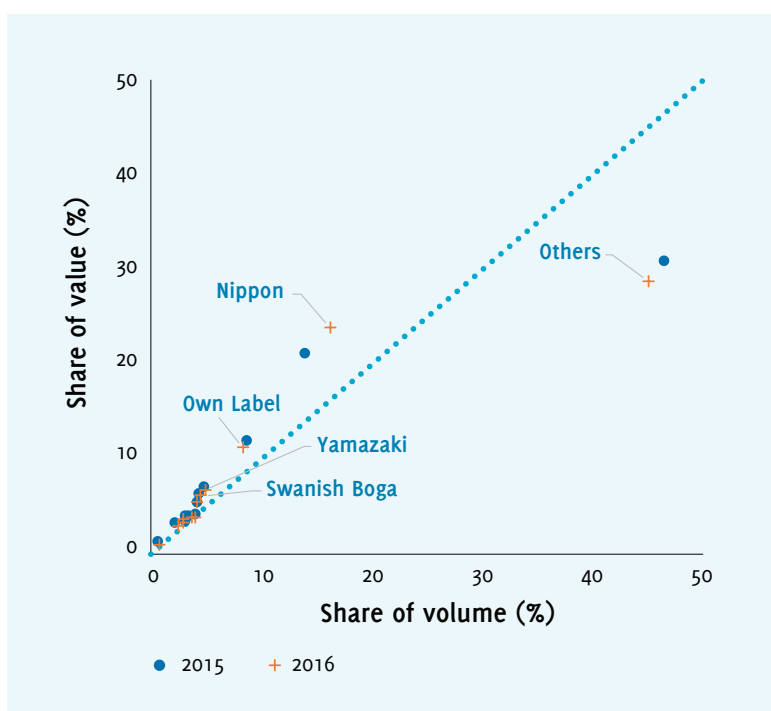
Note: n.p. not published



Indonesia's top three players (Nippon, Yamazaki, Swanish Boga) account for around 26% of total volume and around 36% by value (Figure 7) of Indonesia's bread market, indicating that the big brands are able to extract a premium from consumers compared to their smaller, mostly unbranded competitors. Additionally, Nippon are expanding both market share by volume, and value, at the expense of small (Others) and own label brands.

Figure 7

Market share by volume and value — bread and bread products (%). (Dotted line indicates equal share of volume and value. Brands above the dotted line extract a premium, brands below, are discounted)



Sari Roti today

- More than 4 million bread products produced daily
- 10 factories across Indonesia
- Available in nearly 60,000 individual retail outlets (including 15,000 Salim-owned convenience stores)
- 90% of 'factory produced bread' market share
- Nippon Indosari listed on the stock exchange in 2010
- Averages 30% annual sales growth



Figure 8
Nippon Indosari's dominant Sari Roti brand

The Indonesian bread market is dominated by Nippon Indosari (Table 4) and their popular Sari Roti brand of bread products (Figure 8). Sari Roti importantly has longstanding ties with the Salim Group who control Indonesia's largest and second largest flour millers (Bogasari and Interflour).

Table 4
PT. Nippon Indosari production capacity by factory in 2018

Location	Capacity ('000 pieces per day)
Pasuruan	825
Cikarang Block U	516
Medan	476
Semarang	443
Purwakarta	435
Cikande	434
Cikarang Block W	349
Cibitung MM2100	282
Makassar	156
Palembang	144
Total	4,059

More recently, Japan's biggest bread maker, Yamazaki, and Japan's biggest trading house, Mitsubishi, have joined up to make a concerted push into the Indonesian bread market, becoming the second biggest player behind Nippon Indosari. Yamazaki Indonesia is a joint venture between Yamazaki, Mitsubishi and local Indonesian convenience store chain Alfamart. The bread produced by Yamazaki Indonesia is sold under the MyRoti brand, predominantly in Alfamart's 5,500 outlets across the country.

Nippon Indosari and Yamazaki Indonesia share their Japanese milling and bread production know-how with their local entity. Adoption of Japanese processes enables these businesses to cater to the popularity of softer, Japanese-style bread in Indonesia — particularly among young urbanites. Although Japanese-style bread is popular in Indonesia there are key differences in both the processes and raw materials used by Indonesian bread-makers to ensure that their final product is affordable to produce, while still appealing to local consumers.

Bread in Indonesia, including so-called 'Japanese-style' bread, is comprised of several grades and origins and is subject to variability as prices and availability of particular grades alter. At any one time, bread in Indonesia is likely to include wheat from the USA, Canada, Russia, Ukraine and Argentina. It rarely contains Australian wheat in any sizeable proportion.

The adoption of Japanese processes in Indonesian milling and bread production has matured to the point where the Indonesians now export their own bread products and bread-making expertise. The popularity of softer, Japanese-style bread elsewhere in Asia has seen Sari Roti recently joining Monde Nissin to launch Sari Roti in Philippines. This partnership has been prominently advertised by Monde Nissin who clearly see value in the Sari Roti brand (Figure 9).



Figure 9
Monde Nissin's Philippines internet homepage

Growth rates and variety

Longitudinal datasets on per capita consumption of particular types of bread and baked goods in Indonesia are rarely published; but what reliable datasets do exist (Table 5) reveal strong growth in per capita consumption of bread, cookies and cakes. The fact that so many entrants and market players are contesting for market share is also one indicator of the positive commercial prospects for engaging in the manufacture and retailing of bread and baked goods in Indonesia.

As per capita consumption of bread and baked goods increases, then a greater diversity of product lines is likely, with these products being sold at a range of price points (Table 6) and qualities. This myriad of market opportunities will create a consequent demand for a diverse range of flour types and qualities.

Distribution

Noodles and bread in Indonesia are distributed and sold to consumers in different ways, primarily because of their relative shelf-lives. From the moment a loaf of bread is produced, its freshness declines. Consumers dislike stale bread, yet a packet of instant noodles can be stored for several weeks without any adverse quality implications. While this comparison would apply in any market, Indonesia's archipelagic layout creates unique logistics challenges for any major bread and baked goods producer. These logistics' constraints favour the production and consumption of instant noodles and help underpin the success of noodle brands like Indomie that rely on economies of scale of production. Such scale economies cannot easily apply to the making and distribution of perishable bread and baked goods in an archipelagic country like Indonesia. So, there is no Indofood-style monolithic player in the bakery sector.

Table 5
Yearly per capita consumption of bread (and cake)

Type	UoM	2014	2015	2016	2017	2018	Growth Rate (%)
Toast bread	Pack	0.062	–	–	0.367	0.366	–
Sweet bread	Per 0.1 kg	0.495	–	–	1.104	1.122	–
Cookies	Per 0.1 kg	0.168	0.353	0.373	0.384	0.438	33.3%
Cake	Pieces	0.695	1.245	1.290	1.345	1.431	23.3%

Source: Indonesian Ministry of Agriculture

Similar to noodles, however, major urban centres, where income and population growth occur, are the commercial heartland of bread production and consumption. Bread's perishability and its income-linked demand particularly cause it to be more an urban phenomenon — especially in the packaged goods channel. In Indonesia's more dispersed and remote locations bread consumption will gradually increase, but in those distant regions bread is more likely to be produced by small or family-run bakeries, sold directly from those premises or from nearby street markets or mini-marts.

The distribution channels used by the larger packaged bread producers in Indonesia strongly favour minimarkets, which are similar to 7-eleven-style convenience stores (Table 7). Minimarkets and convenience stores stock perishables like bread and baked goods whose consumption mostly occurs daily. Minimarket sales account for 71% of the total volume of bread sales by one of Indonesia's leading packaged bread producers.

Although SMEs (mostly small shops) are more numerous than minimarkets (Table 7), the bulk of packaged bread purchasing occurs at minimarkets. Due to the perishability of bread and baked goods, direct sales are another sales outlet whereby sellers distribute these products directly by tricycle or motorcycle.

Table 6
Examples – Serving sizes and price by brand

Nutrient	Type	Size (gram)	Price (Rupiah)	\$USD	\$USD/kg flour used*
Sharon	Pancake Dorayaki	65	7,500	0.53	16.3
Sari Roti	Sandwiches	46	4,500	0.32	13.8
MyRoti	Sandwiches	52	5,000	0.35	13.6
Sari Roti	Sweet Bun	70	6,500	0.46	13.1
Sari Roti	Pancake Dorayaki	55	5,000	0.35	12.9
Mr. Bread	Sandwiches	50	4,500	0.32	12.7
Sari Roti	Toast Plain	200	14,500	1.03	10.3
Mr. Bread	Toast Sweet	180	12,500	0.88	9.8
Sari Roti	Toast Sweet	226	15,000	1.06	9.4
Mr. Bread	Toast Plain	220	14,500	1.03	9.3
MyRoti	Toast Sweet	235	13,500	0.95	8.1
MyRoti	Sweet Bun	58	3,000	0.21	7.3

Source: Indonesian Ministry of Agriculture

* Assumes similar incorporation (50%) of flour within each product

Table 7
Type and number of retail outlets for a leading bread producer in Indonesia

Category	Retail share	Retailer	Number of distribution points
Minimarket	71%	Indomaret	10,788
		Alfamart	9,987
		Alfa Midi	885
		Star Mart	96
		Yomart	71
Distribution	13%	Small shops	31,618
Direct Agents	9%	Tricycle	2,121
		Motorcycle	2,409
		Bicycle	494
Supermarket	6%	Lion	125
		Giant	96
		Hero	90
		Ramayana	52
		Carrefour	76
Institutions	1%		



The popularity of Japanese-style bread in Indonesia

The ‘Funwari’ phenomenon

Typically, a foreign company will decide to enter a new geographical market in the hope of generating demand for their products. Fortunately for the Japanese firm, Yamazaki, they have been able to establish a promising position in the Indonesian market because soft and fluffy Japanese-style bread products also suit the Indonesian palate for baked goods.

“Japan’s Mitsubishi Corp. has come up with a business model to sidestep the country’s shrinking population — export Japanese consumption habits to Indonesia.”

Nikkei Asian Review

Looking at some of the retail packaging for MyRoti products (Figure 10) is illuminating.

The Japanese word for ‘fluffy’ (funwari) is an integral element of the overall branding message. However, the most notable aspect of this packaging is not that it uses fluffiness as a selling point — it is the fact that it uses the Japanese word for fluffy and not the Indonesian equivalent. Even more surprising is the packaging for sandwich bread, which takes this one step further and even uses the Japanese *hiragana* characters to write funwari (ふんわり). The only reason to use these characters is that there is strong, positive branding associated with Japanese-style bread. Specifically, the implicit message is one of authenticity and quality.



Figure 10
Myroti retail packaging with prominent use of funwari (fluffiness) as a selling point



Quality and consumer preferences

Each bread market across the world has subtle and unique market requirements, due to their bread-making process, style of bread, ingredients and physical appearance of the bread.

Sweet toothed consumers

Indonesian consumers prefer sweetened bread. Sweetened bread consumption consistently dominates overall bread consumption in Indonesia. Along with the typical Western bread-based foods, such as sandwiches and toasted bread, Indonesians are consuming growing quantities of sweetened bread, pancakes, dorayaki, pastries and donuts.

The relative unimportance of sandwich bread is potentially relevant from a wheat quality perspective, as the functional requirements for each segment will be different. Wheat varieties that perform in the sponge and dough (SD) method of making pan bread may not be suitable for one of the sweeter (and often, softer) bread-based products popular in Indonesia.

Most industrial bakeries in Indonesia use semi to fully automatic bread lines and employ the SD method for making bread. These bakeries currently enjoy a 19% market share in the bread and baked goods sector yet a 36% share solely in the bread sector. By contrast, the numerous small family-owned SMEs usually use manual or semi-automatic bread-making processes largely based on the different no time dough method. Included in the bread-making process for some of these SMEs is a dough-breaking machine that improves the bread quality. In general, if the bread-making process is semi-automatic then stronger flours are used. If the process is manual, then less strong flour is used.

Indonesians love sweet foods. The popular sweet bread has a sugar content of 24%-28%, whilst sandwich bread has 10%-15% of sugar. Fat is also added to improve the crumb structure, texture, and eating quality (softness) of the bread. Sweet bread contains 16-18% fat whilst sandwiches contain 7-10% of fat.

Australian wheat for the Indonesian bread market

Due to its large population, even modest increases in Indonesia's per capita consumption of bread have the potential to absorb a substantial volume of imported wheat. Furthermore, Indonesia's per capita income growth and the sheer number of additional middle-class consumers, with a capacity to pay for a greater array of bread products, will increasingly affect the supply of functionally suitable wheat required to manufacture those products. If Australian wheat is to capture a meaningful portion of this opportunity, there are some clear challenges that must first be overcome (Table 9).

While Australian wheat is clearly recognised for its noodle performance, Asian buyers mostly do not view Australian wheat as highly suited for bread-making. Bread-making remains dominated by North American grades such as DNS (USA), CWRS (Canada) and HRW (USA), as these grades are suited to the SD process used by Indonesia's principal industrial bakeries whose market share is growing.

For cakes and cookies, this segment also is dominated by US WW (Western White). However, there is a reasonable volume of Australian wheat being used in cakes and cookies, blended mostly with WW. Australian wheat is often included in a baker's soft wheat flour for cakes and cookies, but it is rarely the primary grade in this segment and instead plays a supportive role due to either to its cost or lesser functional suitability.

Table 9
Current role and position of Australian wheat in individual Indonesian market segments

Segment	Yield competitive varieties with elite functionality	Widespread use and acceptance of suitable Australian wheat varieties
Noodles	✓	✓
Bread	✓	✗
Baked confectionery	✗	✓

Indonesian processors are familiar with the functional properties of Australian wheat for baked confectionery and some Australian wheat, the APH and AH grades, may be added to bread flour blends when and if those grades are price competitive. In general, in Indonesia's two fastest growing segments, bread and baked confectionery, Australian wheat plays a limited part or, at best, supporting role to North American grades.

Australia's current lack of market share in the industrial baked goods segment, in particular, is only a bad thing if there was a fundamental reason why Australian wheat was technically unsuited for making bread. However, recent collaborations between Australian researchers and Indonesian millers and end-users have, on several occasions, demonstrated that a specific Australian variety, grade or blend can outperform the North American equivalent in properly controlled baking tests. Following this research, the problem is not the lack of evidence of performance when making bread, but rather a lack of a reliable, consistent, price-competitive supply of such wheat from Australia. As observed by Dr Steve Jefferies, managing director of GRDC and a former CEO of Australian Grain Technologies:

"Our issue is not about genetic capacity to produce DNS or CWRS functionality. In fact, that's easy. We can even do much better if we tried. Our issue is being able to produce consistent quality, efficiently segregatable quantities of 14%+ protein wheat."

So, why there is a market perception of Australia as being a noodle wheat specialist and not a producer of high-protein, DNS or CWRS equivalent baking wheats? At a fundamental level, there is one inherent challenge that must be overcome in order to become a concurrent supplier of both high-quality noodle wheat and baking wheat – *the traits that define the ideal noodle wheat or the ideal baking wheat vary considerably*. In fact, not only are they different, but in a certain sense they are almost polar opposites. Most notably, noodles require well-balanced, more extensible dough, while bread requires stronger, less extensible dough. Of the varieties currently classified as APH, there is a clear skew towards wheats with balanced dough properties, which is reflective of the historical importance of premium Asian noodle markets for Australian wheat. However, interspersed within the advanced breeding lines for this wheat class are elite bread-baking wheats likely to gain APH classification.

It is useful to note that North American wheat is subject to the equal and opposite problem – their system is set up to capture high dough strength wheat and therefore, extensible varieties have limited avenues to market. According to a study conducted at Montana State University:

"Our results suggest that traditional selection criteria in hard red spring wheat, including tolerance to dough mixing and high loaf volume may result in reduced dough extensibility."

If the Australian industry decides to target Indonesia's growing baked goods sector, one pre-requisite will be to provide growers with clear market signals to incentivise their adoption of high-performance baking wheats. This would need to be complemented by providing buyers with access to a segregated pool of bread-specific varieties. The decision whether or not to target Indonesia's industrial bread-making sector largely comes down to which approach delivers maximum long-term net economic benefit. Calculating this benefit is no simple exercise, and nor is the outcome obvious. It requires a high-resolution 'paddock to plate' understanding of each factor that affects the cost of production along with an understanding of the value that buyers place on certain functional traits. The outcome might be that Australia is better off focusing on mostly on noodle wheats, for any number of reasons including logistical inefficiencies, environmental challenges or export market volatility. Or Australia could attempt to boost its production of AH wheat to ensure it captures a larger portion of the flour blend required by small family-owned SMEs that usually use manual or semi-automatic bread-making processes largely based on the different no time dough method to which Australian wheat is better suited.





Whatever strategic position the Australian wheat industry pursues, it will be against the backdrop that there is no market for wheat anywhere else in Indonesia, or even further afield in neighbouring Asian markets, that comes close to offering as much possible upside as Indonesia's bread and baked goods market.

Functional requirements of the Indonesian bread market

While Australian wheat is seldom used specifically for its baking properties in the Indonesian market, AEGIC has established a detailed understanding of the Indonesian baking sector's functional requirements. For the average Indonesian baker, whether an individual bakery or large manufactured brand, the most important measure is loaf volume. The more bread that can be produced using a given quantity of flour, the more revenue can be generated.

If loaf volume is a key end, then the means are the functional and quality traits that drive loaf volume (e.g. Dowell *et al.*, 2008). Some of the key functional and quality traits for bread-making are displayed in Figure 12.

Grain quality and dough-rheological parameters are indicators of the end product functionality. For example, wheat with protein content above 13% will usually make better bread than wheat with only 10% protein and softer white wheat around 10.5% protein will usually make better udon noodles than hard wheat at 13%.

End use or baking functionality depends on a complex set of grain attributes and one indicator (e.g. grain protein) is rarely a sufficient indicator of end use functionality. Moreover, even when a set of measures is considered, their correlation with end use performance is not perfect. A useful example is high protein wheat from Kazakhstan, which can reach the 16-19% protein content range. If there was a perfect positive correlation between protein and baking functionality, Kazakhstan wheat would dominate the Indonesian and greater Asian bread markets. However, a clear message from end-users is that Kazakhstan wheat, irrespective of protein content, bakes poorly. In fact, recent feedback suggests that this view applies also to Ukrainian and Russian wheat to varying degrees. This important technical understanding is illustrated in Figure 12 that shows the dough rheology and bread quality associated with wheat from various origins; Kazakhstan, Ukraine, Russia and Australia.

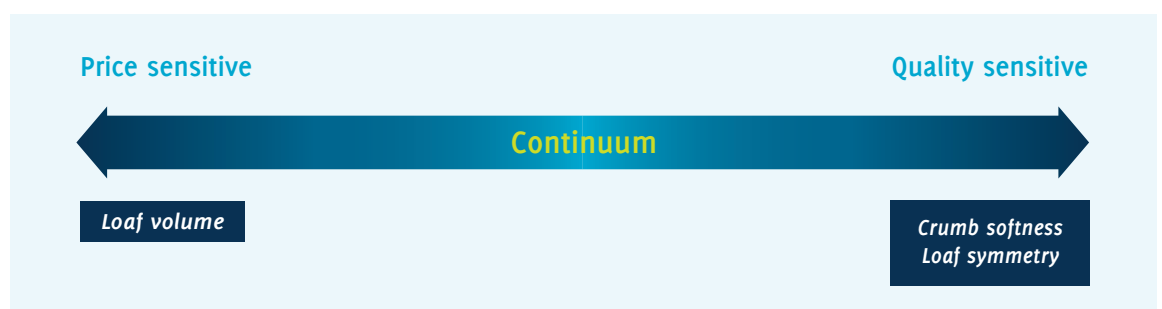


Figure 11
Price/quality sensitivity continuum

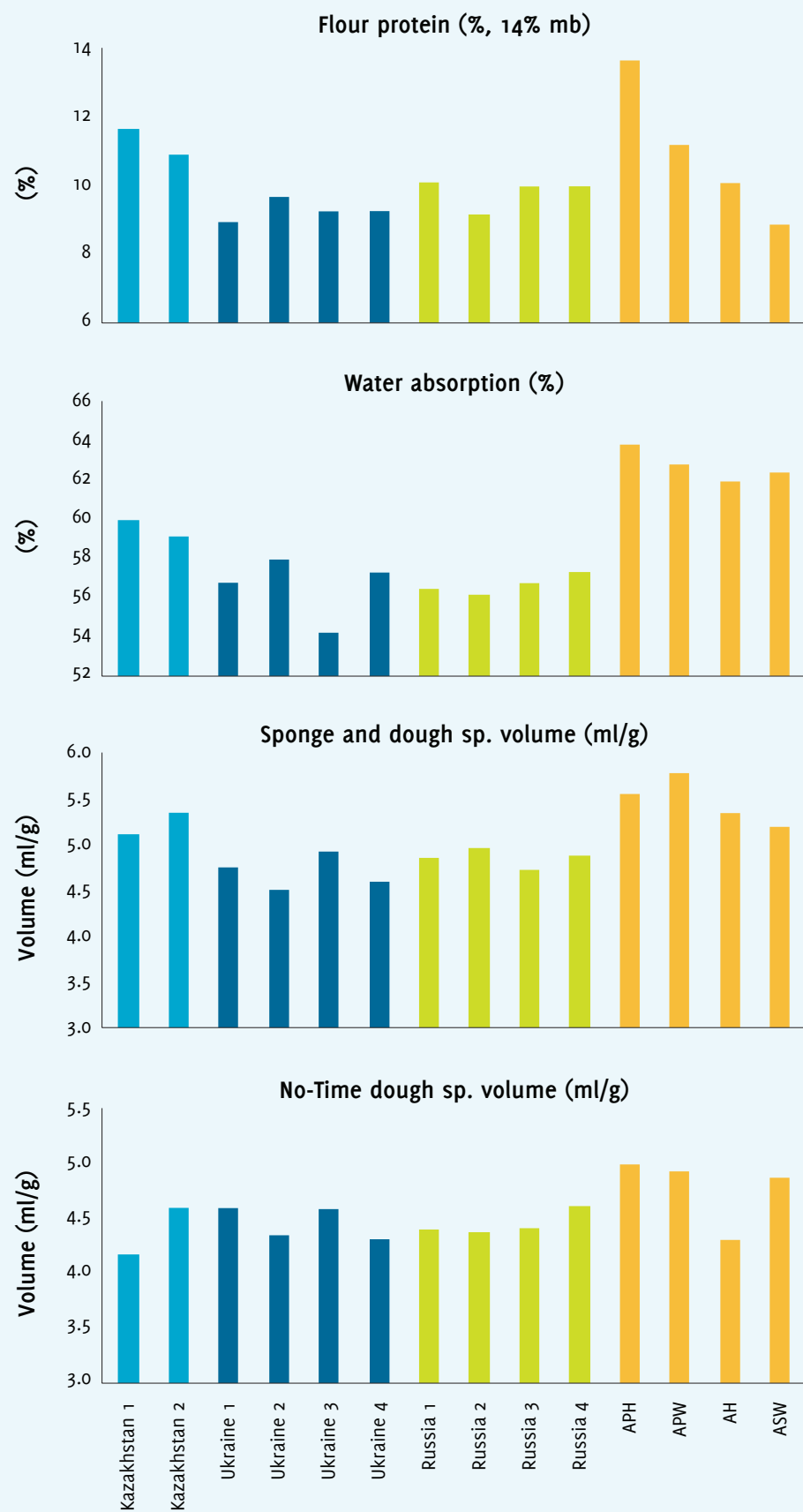


Figure 12
Baking performance –
Australian wheat
v Black Sea wheat

Source: AEGIC

Figure 12 illustrates some of the complexity of the relationship between protein and baking performance.

Looking at the Australian grades (APH, APW, AH, ASW — in orange) in isolation, there is a reasonably strong positive correlation between protein content and water absorption inasmuch as APH and AH have the highest protein content and the best water absorption. However, perhaps more tellingly, despite containing more than 20% extra protein, the APH and APW wheats used in this study by AEGIC have roughly similar water absorption.

Looking across all the wheat samples in Figure 12, protein content appears to be a poor indicator of baking performance. This is most notable in the Kazakhstan samples, which, despite having higher than average protein content, have poor water absorption and loaf volume. Perhaps the single most interesting comparison is between the ‘Kazakhstan 1’ sample and the ASW sample from Australia. Despite having 3% less protein content, ASW achieved 2% better water absorption, roughly similar sponge and dough (SD) volume and 20% *greater* rapid dough (RD) volume.

So, why are such findings of relevance and importance for Australian wheat? Australian wheat is unlikely to prevail in any ‘highest protein wins’ scenario against Black Sea wheat, which is produced on rich, black, highly fertile *chernozem* soil. Similarly, protein comparisons between Australian wheat and North American grades such as DNS see Australia lagging well behind in the protein content stakes. Therefore, the prospect for use of Australian wheat in the Indonesian and wider Asian bread markets hinges on Asian end-users having accurate and adequate technical knowledge about how best to use Australian wheat for baking. Hence, continuously demonstrating to potential end-users that lower protein Australian wheats can have equivalent baking performance to some higher protein wheats can be an expensive yet sound investment by the Australian wheat industry. Fortunately, despite some long-held views, market indicators are emerging of a willingness to pay for performance rather than solely for protein superiority.

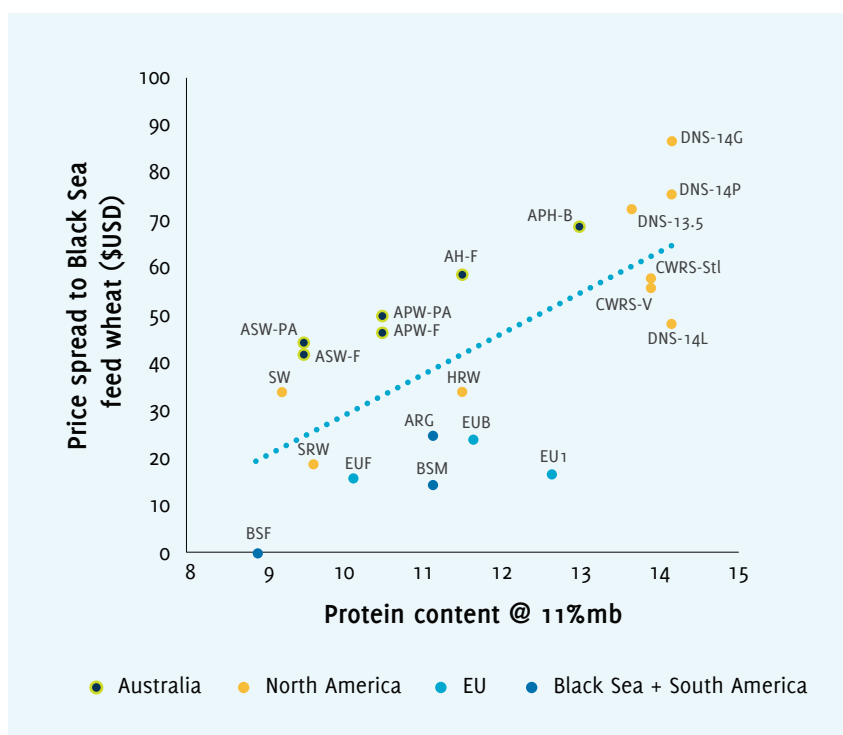
Figure 13
Protein content and FOB price difference to Black Sea feed wheat (\$USD) for the period 2015–2019. Based on data from the International Grains Council (2019).

Note: the acronyms near each point describe the type of wheat being sold (e.g. BSF = Black Sea Feed wheat; EUF = European Union Feed wheat)

Although prices are positively correlated with protein, the correlation is not perfect and other factors contribute to explaining the differences in prices. In Figure 13 the protein content at an equivalent moisture basis is plotted against an FOB price for each origin. The trend line on the chart indicates the expected price as a linear function of protein. So, although Australian grades have lower protein than North American, EU and Black Sea milling grades, they also importantly sit above the trend line, indicating there is a willingness to pay for quality, above the pure value of the protein content of these wheats. This suggests there is already an awareness that protein content is not a sole accurate measure of the utility of Australian wheats.

Some useful observations and implications flow from Figure 13:

- North American high protein grades attract a premium over all other grades. However, grades from other origins at a range of protein levels do not attract prices solely attributable to their protein level. For example, over the period 2015–2019 Black Sea milling wheat at around 11.1% protein traded at a discount of around \$20 to APW-F, which contained only 10.5% protein.
- Canadian wheat (CWRS) traded at a significant discount to American DNS, despite both having roughly the same protein content.
- DNS, used primarily for baking, attracted a premium of \$40–\$50 over Australian APW.
- To generate the very high premiums requires either producing wheats with protein levels between 13.5% and 14% or producing elite baking wheats that perform similarly to such high protein wheats, yet which have lower protein levels.



Bread wheat in Indonesia – functional requirements

Grain quality and dough-rheology are essentially a means to an end, so understanding what quality and functional traits for baking are most sought after by end-users is important to understand (e.g. Dowell *et al.*, 2008). These main traits, in descending order of importance for Indonesian bread-making, are:

1. High protein (relative to noodle wheat in particular)

Protein content is an important measure because, unlike dough-rheological data, protein content can be quantified at the grower's point of delivery, via an NIR (near infrared) machine. Protein content is a key indicator of likely functional performance. However, because the correlation between protein content and baking performance is imperfect, protein content can function as a useful initial filter, but in isolation is insufficient as reliable indicator of likely baking performance.

Protein content is important for processors for several reasons, and in particular, the relationship between protein content and end-product texture. Generally-speaking, for Asian noodles, higher protein means firmer texture. This is why APH is valued for its ability to produce elite yellow alkaline noodles (YAN) such as ramen, which are relatively firm, while soft white noodles (Udon) typically require relatively lower protein levels. Similarly, soft, fluffy cakes generally require even lower protein content. In terms of baking, higher protein is associated with better dough stability and therefore, better end-product appeal.

Protein content is also a useful indicator of likely milling properties, as higher protein wheat tends to be easier to grind at the milling stage. Softer wheats can 'fluff' up and cause blockages in milling.

2. Dough strength

Dough strength is a critical component of end-product composition, shape and texture, particularly for long fermentation baking methods such as sponge and dough (SD), which are common across much of Asia. Baking in general typically requires stronger dough than noodles.

3. Dough stability

Dough stability indicates the time required for the mixed dough to form its maximum consistency and is often a useful indicator of dough strength. Stability of a dough indicates its tolerance to over- or under-mixing. A good quality dough has a stability of 4 to 12 minutes. For industrial dough mixing too short or too long mixing times are not desirable.

4. Wet gluten

Both quality and quantity are important when looking at wet gluten numbers. Wet gluten content is strongly influenced by environmental and seasonal factors and is closely correlated with the protein content of the wheat grain. When water is added to wheat flour most of the proteins in the flour hydrate to form gluten. In bread-making, strands of gluten form a network that traps air bubbles produced through fermentation that then allows the dough to rise.

5. Water absorption

Water absorption differs from the other drivers as it is largely a commercial issue, rather than a technical or end-product quality factor. Just as milling yield determines how much flour can be produced (and sold) from a given quantity of wheat, so water absorption is a key determinant of the volume of bread that can be produced from a given quantity of flour.

6. Loaf symmetry

Like most food products, the consumer has an idealised image of the perfect bread loaf, which will invariably be symmetrical. All things being equal, consumers therefore loathe loaves that are not misshapen. Loaf symmetry depends on gluten quality and wet gluten content (see #4).

7. Crumb texture

Crumb texture is one of the most important sensory attributes. It is a measure of softness that is determined by bread-cell measures such as the number, shape, size and thickness of each cell within the loaf. Crumb texture is only partly driven by wheat quality traits, as bakery processing methods can affect crumb texture.

The above-mentioned wheat quality requirements of the Indonesian bread market need to be placed in historical context. In Indonesia, large-scale industrial bread makers rely on the sponge and dough (SD) process that involves a fermentation stage for sponge mixing, followed by a dough-mixing stage. Bread made using the SD process is widely regarded as having superior quality characteristics such as softer crumb and better shelf-life. However, the reasons why this process is used widely in Indonesia are not solely related to end-product quality. Historically, Indonesian industrial scale bakers have favoured this bread-making process for two main reasons. Firstly, after World War II, the Indonesians had ready access to abundant, stable supplies of North American wheat grades that required use of the SD process. Those reliable supplies of wheat supported the growth of bread production in Indonesia. Secondly, the US Wheat Associates and similar Canadian organisations provided strong technical and educational support for the use of North American wheat grades in bread-making. Millers' familiarity and competence in using these North

American wheats helped cement the use of the SD bread-making process in Indonesia among large-scale, industrial bakers that comprise a growing share of Indonesia's bread market.

Yet, by contrast, large-scale bakeries in Australia that supply all the main supermarkets in Australia rely on the rapid dough (RD) or no-time-dough process. This process was developed around 70 years ago as a quicker (and cheaper) method of bread-making, characterised by its use of accelerated mixing to develop the gluten instead of the traditional approach where this is achieved via a slower (and therefore, more expensive) fermentation stage after mixing. The RD method had commercial appeal as bread produced using RD took only half the time that SD bread-making required. As bread has a very short shelf-life, RD provided large-scale bakeries with the opportunity to apply a 'just in time' production approach. In Indonesia it is the small family-owned SMEs, rather than the large-scale industrial bakeries, that depend on the no time dough method.

SD baking is used in Indonesia because grades like DNS, which have been historically abundant and affordable, do not bake well under RD systems. These grades require the extra fermentation step to make the dough workable. In other words, to make high-quality bread with DNS grade wheat requires use of SD baking.

The contrast between the SD and RD processes, and the wheat classes they rely on, forms a key challenge for Australia's wheat industry should it specifically wish to target the Indonesian bread market:

1. Industrial baking systems in Indonesia have largely been developed around North American wheat classes.
2. To use existing Australian bulk grades, such as APH and AH, Indonesian bakeries would need to adopt the RD approach which would require a fundamental change in their baking process.
3. Australia currently produces some hard wheat varieties which could match the SD baking performance of North American grades. However, these wheats are typically delivered as APH or AH and are blended with other varieties, which do not have the same quality profile as the North American bread wheat classes such as DNS.

Although the RD process has some economic advantages over the SD process, in the short term at least, a widespread shift away from SD baking is unlikely by Indonesia's large-scale, industrial bakeries. While the importance of basic protein content in bread-making can be over-stated, it remains true that bread, in general, requires a hard wheat a protein level around 13%. Australia can produce wheat at or around this level, but there is considerable year to year variability of the volume of such wheat, as there are only a small number of geographic areas where targeting higher protein is economically feasible.

In recent seasons this has been compounded by pronounced seasonal variation in the APH heartland of northern NSW and southern Queensland. The recent prolonged drought in these areas, along with the lack of geographic production distribution makes it more difficult to mount a compelling narrative with end-users to shift bread wheat demand from North America to Australia.

By contrast, Australia is a much more reliable supplier of mid-protein wheat that is more suited to blending and for use in noodle production, baked goods and bread-making reliant on the rapid dough (RD) or no-time-dough process. Wheat with this quality profile and protein content forms the backbone of Australian wheat exports and is produced across much of southern Australia, including parts of NSW, Victoria, South Australia and WA. If Australia could geographically spread its production of higher protein wheat, then it could become a more reliable and affordable supplier of wheat that is functionally attractive for bread flour blends in Indonesia.

In scenarios where one player seeks to gain market share at the expense of a well-entrenched incumbent, one approach could be to first identify and claim a small, relatively undefended 'beach-head', which can then make additional gains more likely. A possible example of this would be to pursue niche market opportunities such as the small yet growing wholegrain bread product segment in Indonesia. Australian white wheat could potentially enjoy a commercial advantage in wholegrain products due to perceived superior colour and flour extraction rates. As the nascent health-conscious, wholegrain market gradually expands in Indonesia then Australian wheat can be positioned to capitalise on this growth.



Strategic considerations

Australian wheat is not well-recognised for its suitability as a baking wheat in many Asian markets — including Indonesia. Some of the reasons for these perceptions and resultant small market share for Australian wheat are:

- Use of wheat grades supplied from other origins is so entrenched that milling expertise, end-products and consumer preferences are closely tied to the functional traits of historically available wheat, rather than any fundamental requirement of the end product per se.
- Indonesia already has significant grain trade-flows with these exporting countries, who can then exploit economies of scale and opportunities for combination cargoes.
- There is the potential for end-user perceptions to be based on either out of date information, assumptions based on noodle functionality or information that hasn't been communicated with requisite nuance.
- The available exportable surplus of the potentially suitable grade of Australian wheat is subject to annual fluctuations that limit access and affordability for overseas buyers. While this does not preclude spot purchasing of Australian wheat to play a supporting role in a particular grist, it does disincentivise the use of the relevant Australian grade as a central component of a grist.
- Genetic or environmental factors in Australia prevent expression of a necessary functional trait.
- Functional traits for a particular end-use have not been bred for or classified for in Australia. This could be due to:
 - The traits are difficult to select for.
 - Widespread adoption of wheats with required functional traits might put existing markets at risk due to shifts in the profile of the relevant grade(s).
 - Breeding for these traits may create unacceptable agronomic trade-offs.
 - There may be no easily viable pathway for the breeder to achieve a return on their investment into these traits.
 - There is no strong, lasting market signal that these particular functional traits are sufficiently valued in the market.

SWOT analysis

A SWOT analysis of the Indonesian bread market helps reveal the strategic implications and challenges for Australian wheat exports to target the Indonesian bread and baked goods sector.

Strengths

- **Growth** — While smaller than the noodle market, the bread market is growing at both the per capita level and total demand level at a much greater rate than noodles.
- **Market requirements** — Australia already produces APH varieties that can match or outperform North American wheat.
- **Freight scale** — Australian wheat already enjoys significant bulk and container freight traffic between Australian and Indonesian ports, which should contribute to timely, cost-competitive freight that can handle a range of parcel sizes.
- **Customer needs** — Indonesian processors currently have few options outside certain North American grades when sourcing wheat for premium baked goods and bread products. The emergence of a new option from Australia, with volumes becoming available at a different point in the calendar would be useful. Being a white wheat, Australian varieties are particularly suited to the wholegrain bread market that is likely to emerge in the long run as Indonesians increasingly become health conscious.

Weaknesses

- **Protein** — More than any other wheat product segment, bread requires higher than average protein content, which is an historical weakness of Australian wheat production due to Australia's comparatively infertile growing conditions.
- **Perception** — Australia is considered by much of the Indonesian (and Asian) market as a 'noodle specialist' supplier and familiarity with Australian wheat as an elite baking wheat is limited.
- **Stability of supply** — Using Australian wheat for the baking segment would have obvious appeal for buyers, but a limiting factor is the stability and affordability of supply from Australia — particularly if there are notable differences in milling or baking properties compared to DNS or CWRS.
- **Noodle market requirements** — The functional traits that underpin Australia's historical success in the noodle market are, in some cases, the opposite of what is required by bread makers. The interplay between dough strength and elasticity is one example.



- **Inertia and path-dependency** — In a battle between ‘status quo’ and ‘strategic pivot’, probabilities will always favour staying the course, unless a situation is perceived as critical. In the case of breeding, choices made years or decades earlier can preclude, or at the very least hinder, an easy shift in direction. In the case of bread-making, the status quo use of North American wheats offers familiarity and convenience, whereas switching to Australian wheats offers uncertainty in reliable availability, technical suitability and affordability.

Opportunities

- **Supplier concentration risk** — The successful penetration of this market segment would contribute to a partial de-risking of Australian wheat exports. At present, the prospects for Australian wheat in the export market are tied mostly to noodle consumption.
- **Buyer concentration risk** — Supply of affordable, functional Australian wheat in flour blends for bread and baked goods assists Indonesian buyers to diversify their source of grain and reduces their strong dependence on wheat classes from certain origins. Moreover, Australia can become a useful source of wheat for wholegrain bread products, serving the growing needs of health-conscious Indonesians.
- **Grade fine-tuning** — By excluding varieties from the APH and AH grades that are suited to the SD bread-making process and segregating them, increases the likelihood that the remaining APH grade will be incrementally better suited to Asian noodles.
- **Benefits beyond Indonesia** — Positioning Australia as a niche, premium baking wheat supplier for Indonesia would additionally provide potential exposure to other bread markets across Asia.

Threats

- **Competitor reaction** — Any effort focused on claiming market share from a competitor is likely to trigger a protective reaction. Such reactions usually centre on pricing and retaliatory actions in other key markets for Australian grain.
- **Scattered resources** — Reducing market concentration risk can go too far and scatter the resources that provided the sound commercial returns to the original focussed effort. For example, switching wheat breeding resources into developing elite baking wheats may lessen breeding resources for noodle wheats and thereby weaken Australia’s market strength in provision of superior noodle wheats.
- **Losing critical mass** — At a national level the export of Australian wheats for baking would not involve sales volumes of such a magnitude that imperilled the ability to supply wheat for noodle production. However, within some specific port zones, exportable volumes of wheat for noodle production might be affected.

Besides selecting Australian wheats better suited to SD bread-making, another option is to breed superior soft wheat varieties that are well-suited to cakes and cookies as a complement to the use of US SWW (. Australian wheat currently is blended with US WW in making cakes and cookies. Australian wheat could be made more functional for such blending if Australian wheat farmers could competitively grow Australian Soft (ASFT) varieties suited to cakes and cookies manufacture. Currently for Australian wheat farmers, there are no soft wheat varieties with an agronomic performance sufficient to entice farmers to switch from current high-yielding hard wheats such as Mace or Scepter.



Specialisation versus generalisation

“He who defends everything, defends nothing.”

Frederick the Great, Prussian General

An outcome of the SWOT analysis is the identification of the strategic issue of specialisation versus generalisation. In short, how diversified should the portfolio of wheats Australia produces be? This is an increasingly pertinent consideration, given the relative growth of Indonesian wheat consumption and Australia’s exportable surplus of wheat. By 2030, the growth in the exportable surplus of wheat in Australia is expected to grow by around 2mmt (Kingwell, 2019b). Based on historical performance, 20% of this volume would be exported to Indonesia. So, roughly 0.4mmt of additional Australian wheat may be available to service the expected additional wheat demand in Indonesia (for food only) of ~2.1mmt.

Developing varieties specifically for the Indonesian bread market could either form part of the Australian wheat industry’s strategy toward 2030 or suitable varieties could arise serendipitously. The latter occurs in breeding programs when, although unintended, advanced lines of elite quality bread wheats are revealed. If there

is a path to market for these potential new varieties it is opportunistically possible to compete in the Indonesian bread market without requiring any large-scale, focused breeding effort. However, the more certain pathway to support entry to the Indonesian bread market is a targeted, well supported strategic breeding effort that develops suitable bread wheats.

Currently there is a diverse use of wheat in Indonesia (Figure 14). The noodle segment is one that favours use of Australian wheat. Instant noodles are a key component of wheat-based foods consumed by Indonesians and demand for wheat used in noodle production in Indonesia will continue for the foreseeable future. However, as identified by Kingwell et al (2018), this segment faces some headwinds relative to bread and soft wheat demand.

Figure 14
Major wheat-use segments in the Indonesian market

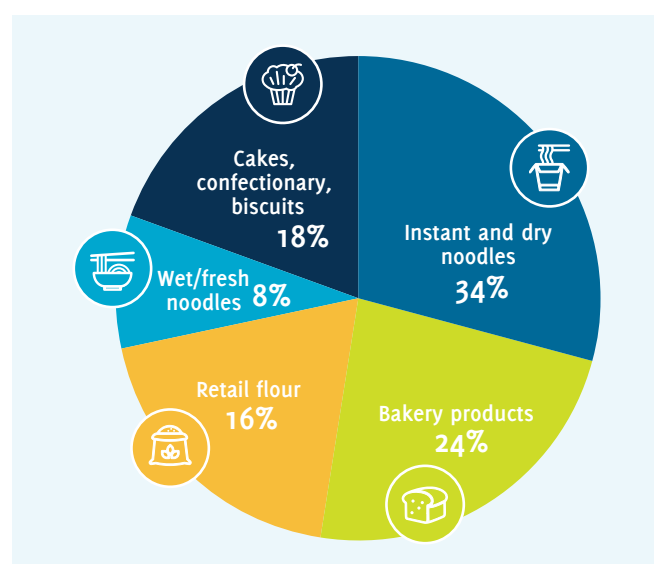
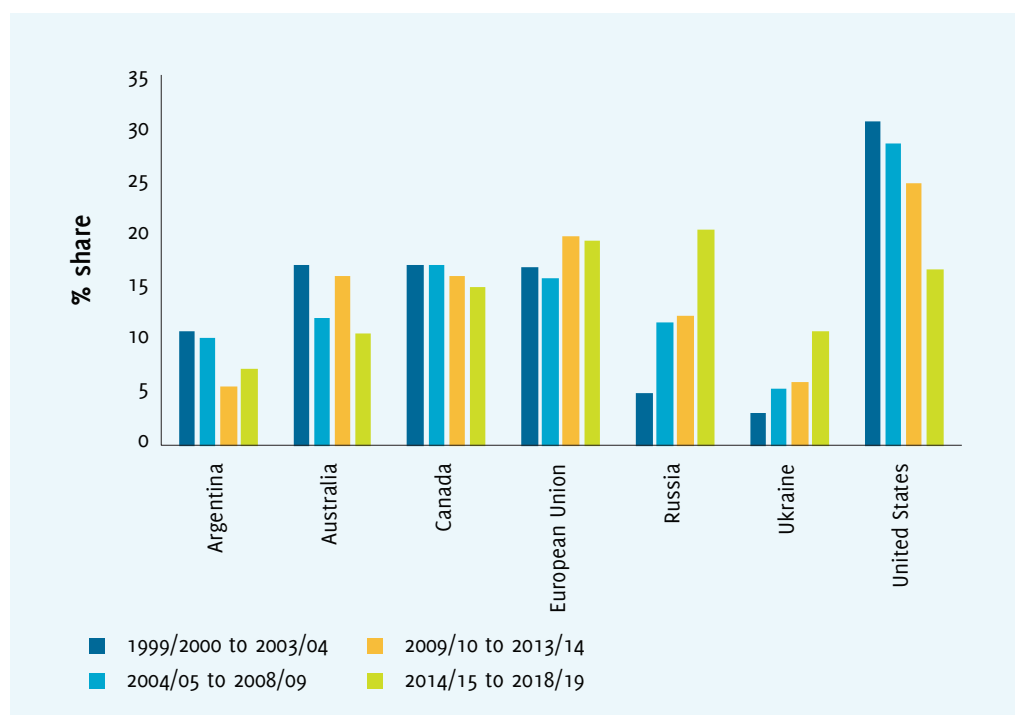


Figure 15
Country shares of
volumes exported by
main wheat exporters
in various periods



Per capita consumption of instant noodles in Indonesia appears to have become saturated to the point where, on a per capita basis, consumption of noodle wheat has recently started declining. However, importantly, due to Indonesia's continued population growth, total demand for instant noodles has managed to hold steady.

By contrast, on both a per capita and total demand measure, bread, bread-products and baked confectionery consumption is growing at a much faster rate than noodle consumption. If this trend proves durable and Australian wheat continues to be used primarily as a noodle wheat, its share of the Indonesian market will erode. The bread and confectionery market would therefore provide competing origins with an entrenched position from where they would be ideally placed to target the noodle market, using freight economies of scale and the potential to offer buyers a diversified suite of grades and quality profiles.

Strategically, the growing segment of health-conscious Indonesians is a market opportunity for using Australian wheat in wholegrain bread products. As a source of white wheat with a low risk of contaminants, Australia is well-placed to serve any growth in wholegrain bread product consumption. Moreover, the naturally sweeter flavour of these products, when based on white wheats, means less sugar needs to be added to these products to counter the usual bitterness associated with use of red wheats.

Low-cost entrants

In terms of the decision to either focus on defending noodle market share or aggressively go after the bread market, understanding the nature of the threat from low-cost origins (Figure 15) is arguably more important to quantify than existing Canadian and US market share.

As detailed by Kingwell *et al* (2016a and b; 2019a), Russia and Ukraine represent a significant threat to Australian wheat exports in markets across Asia. Russia alone has publicly stated a goal of growing wheat production by 25mmt over the coming decade(s) – in other words – they intend on adding volume equivalent to the total Australian wheat crop. This additional volume will need a home, and, depending on the pace of wheat consumption growth in the African and Middle East markets, a large portion of this new tonnage is likely to find its way to Indonesia and other Asian markets.

Black Sea wheat producers account for almost half of the world's premier chernozem soil, which means that high protein wheats could be produced with comparatively little additional effort or risk. Furthermore, in addition to the exceptional soil quality, it is spread across such a large area that there remains a fallow capacity that can come online if market conditions so warrant. Clearly, due to the emergence of such large, low-cost suppliers, a competitive strategy for Australia whereby Australia attempts to match the production of large volumes of generic high-protein wheat has limited prospects.

A related technical question is whether wheat from Black Sea producers currently is better suited to bread or instant noodles? The answer to this question will help determine the most appropriate competitive reaction by the Australian wheat industry. As of 2019, the following is known:

- Compared to Australia, Canada and the USA, Black Sea wheat does not excel in any particular end-product and is thus not used for any particular unique functionality. At present, its low price is its distinguishing and most attractive feature.
- Due to what is often a notable price difference compared to Australia and North America, Indonesian mills and end-product processors have invested significant effort towards incorporating a certain proportion of Black Sea wheat into their flour and end-product mix.
- As they mature as wheat exporters into the South-East Asian market, Black Sea wheat exporters are likely to gradually improve the quality of their export wheat due to investments in agronomic and supply chain improvements.
- Concurrently, end-users are becoming more familiar with Black Sea wheat and its performance as a blend ingredient for certain end-products. Black Sea wheat is likely to be incorporated into certain grists at a greater proportion than current levels.

Thus, this growing wave of Black Sea wheat will increasingly find its way into bread and instant noodles in Indonesia. At what rate and to what level of inclusion will determine the economic consequences for Australia's wheat industry.



Supplying Indonesia's bread and baked products market

Are there any insurmountable supply-side issues hampering our ability to supply this market? Perhaps the most essential consideration is understanding the break-even cost of landing elite baking wheat in-market, including costs associated with producing wheat for this market. Such costs could include:

Farm production costs

In order to incentivise the adoption of varieties sought by this market, a critical component would be neutralising any gross margin penalties (relative to the grower's current best option). For example — if the grower is 5% worse off on a per hectare basis by growing functionally suitable baking wheats, this gap must be accounted for in grower prices. Any additional risks must also be considered — particularly considering the higher than average protein levels sought by end-users — including cascade risks, in the event that minimum protein levels are not met. Also, depending on the scale of adoption, the grower may face additional freight costs depending on the spatial distribution of upcountry and port delivery locations for an elite baking segregation.

Storage and logistics

New or niche markets present challenges and additional costs to those tasked with moving and storing grain destined to those markets. Any stratification of a logistics network will usually involve added cost through the inherent inefficiency of handling multiple small parcels instead of one, homogenous and fungible grade. Small parcels of grain cause loss by division costs for grain handlers and reserved space may not always be filled with the expected volume of grain. This cost can be partially shifted further along the value chain in the event where 'take or pay' arrangements apply.

Until a new market has reached critical mass, the cost hurdle between containerised versus bulk freight acts as a disincentive. New markets growth from zero to full vessel-sized quantities (25kt to >50kt) is usually via the initial use of containerised freight.

It is vital that all additional costs and risks are properly captured when evaluating the potential value of Australian wheat entering new markets such as Indonesia's bread market segment. Often there are hidden costs that are the difference between an attractive opportunity and loss-making. Hypothetically, identifying a new market that is prepared to pay \$30/t premium over the standard grade may or may not be attractive once the true cost of landing this grain in-market is quantified.

Impacts beyond Indonesia in Australia's other wheat markets

Consequences to consider include:

1. Impact on existing grade profile

Under any scenario where an elite baking grade is carved out of existing grades (namely, APH and in some cases, AH), it will be important to model the impact on the affected grades in terms of noodle functionality. Noting that elite baking wheats make sub-optimal noodle wheats, their removal from the APH grade, could improve the use of the APH grade in noodle-making.

While this might appear to be a textbook 'win-win', it is important to note that millers and end-product makers seek not only *higher* quality, but *stable* quality also. Japan again serves as a useful example of this as small variations in inter and intra-season quality is noticed by noodle makers. While Japanese mills typically mitigate this by implementing 'phase-in/phase-out' blending across seasons, or in some cases, shipments, clear communication ahead of time is critical.

Even within Indonesia it would be important to communicate any shifts in quality profile for their existing noodle demand. The key issue would then be whether communication alone would suffice or whether further remedial action would be required to calibrate other grades beyond the newly created elite baking grade.

2. Impact on stability of supply

Owing to its comparatively small domestic population, Australia often is able to export a large proportion of its annual wheat crop. This means that, compared to other exporters who may intermittently throttle supply to maintain domestic stocks, Australia is able to maintain its image as a stable supplier — droughts notwithstanding. This reliable supply is a critical point of appeal for Australia's major wheat buyers — many of whom, Indonesia included, rely on Australian wheat to meet national food security objectives. There is little merit in sacrificing a long-held, hard-earned reputation in the interests of a new market if it simply becomes a zero-sum game.

3. Potential to capture additional market share in other bread markets

In assessing the economic rationale associated with Australia playing an increased part in the Indonesian bread market, a key consideration should be the potential to capture equivalent market share in other Asian markets. Capturing multiple markets creates additional benefits, such as the ability to avoid concentration risk and the potential introduction of some competitive tension. However, it is important to note that success or failure in one market does not necessarily mean that other markets face the same likely prospects. Bread can be made in several ways in different markets and each market comes with unique consumer preferences that may be better or worse suited to Australian baking wheat. A variety considered 'elite' in one market may be unsuitable in another — even under broadly similar production processes. Nevertheless, successful penetration of the Indonesian bread market makes similar success in other markets more likely.



Australian wheat industry views

There is widespread agreement that Indonesian demand for bread and other baked goods will grow strongly. However, there is no widespread agreement over the merits of Australia's wheat industry committing resources and effort to especially serve that growth in demand. Further industry discussion is required to form a consensus about Australian wheat industry actions that would generate sufficient profit from the expanding demand for bread and baked goods in Indonesia.

Currently in Australia there is range of views regarding the prospects of Australian wheat in the Indonesian bread market, from extremely bearish to extremely bullish. Coalescing such a range of views into a cohesive position is difficult, yet there is some commonality in views. The issues that evoke strong, fair or no consensus are outlined below.

Strong consensus

- There are no genetic reasons why Australia cannot breed elite baking wheat.
There are some varieties, currently available, that meet or exceed market requirements for this segment.
- Due to well-documented environmental and climatic challenges, Australian wheat currently struggles to achieve the volumes of high protein wheat relative to what is available from North American and Black Sea origins. Australia's climatic variability suggests that Australia may not be a stable, reliable supplier of large quantities of elite baking wheats.
- Irrespective of how the Indonesian diet continues to evolve, the noodle segment will continue to be the most important for Australian wheat exports for the foreseeable future.

Fair consensus

- Among existing Australian wheat grades, there are none that are optimally suited to the Indonesian bread market. At present, the closest equivalent to DNS or CWRS is high protein APH, however this is not considered to be substitutable with these other grades.
- At the very least, there is a niche market opportunity for some growers in geographically favourable areas to supply a limited volume based on a limited number of APH varieties suited to bread-making based on the SD process.

Lack of consensus

- How significant, or probable, is the opportunity for Australian wheat in the Indonesian bread market?
- What is the best course of action going forward?

To reinforce or build further consensus in Australia's wheat industry, concerning how best to respond to the growing market opportunities in Indonesia's bread and baked goods sector, requires further industry discussion. Resources devoted to pursuing this market opportunity may generate higher returns if applied elsewhere; even to maintaining the status quo. To help inform such industry discussion some additional feasibility studies may be required. Examples of such analyses are:

- Agronomic and functionality comparisons between Australian CWRS/DNS-style varieties and benchmark alternatives. This would include varietal yield comparisons and a consideration of cliff-face risks associated with meeting protein requirements.
- Farm production and supply chain cost studies, including –
 - Which growers in which regions are most likely to profit from growing elite baking varieties for the Indonesian market?
 - Considering relative yield, production costs, supply chain costs, protein variability and price relativities, what would be the ultimate cost per tonne and profit margins across the segments of the supply chain to land bread wheat into the Indonesian market, compared to the existing APH and AH grades?
 - What are the requirements for cost-effective containerised freight capacity while volumes of new Australian varieties tailored to the Indonesian bread and baked goods sector are grown to the point where single-hatch bulk freight then becomes economical for all supply chain participants?
 - How to maintain stable grain quality and functionality while volumes remain limited and do not allow for optimal blending and homogenisation?
 - How to manage issues of under-utilised storage and loss by division while volumes remain limited?
- Marketing and technical studies
 - Are end-users aware of the potential for Australia to produce wheats suitable baking in Indonesia?
 - Assuming the availability of commercial quantities of Australian bread wheat that could compete on price and/or quality, is Australia perceived to be a stable, reliable supplier of such types of wheat?
 - What level of technical collaboration and research will be required to give end-users comfort regarding the milling and functional traits of Australian wheat compared to the incumbent grades?
 - How long lasting will be the bread market share of the small family-owned SMEs in Indonesia that rely on the no time dough method more suited to greater inclusion of Australian wheat classes like AH.

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Conclusion

In contrast to noodle consumption, per capita bread consumption in Indonesia is a smaller draw on wheat use in Indonesia. However, Indonesia's per capita consumption of bread and baked goods is growing and represents a potentially large source of additional wheat import demand. Indonesia's per capita income and population are increasing, fuelling the import of wheat for its bread and baked goods sector.

However, the bread market in Indonesia remains dominated by North American grades, with DNS and CWRS viewed as benchmarks by millers servicing the large-scale industrial bakeries whose market share is increasing and who use the sponge and dough process in making bread. Australia does not presently offer a grade that competes directly against DNS and CWRS.

Although bread typically requires higher protein wheat with comparatively strong dough — neither of which are a comparative advantage of current Australian wheat — nonetheless small family-owned bread-making SMEs in Indonesia rely on the no time dough method that is more suited to greater inclusion of Australian wheat classes like AH. Australia potentially could increase its role in the flour blends used by these small businesses by continuously demonstrating the bread-making functionality of relevant Australian grades.

Australia could also position itself as a reliable source of wheat for wholegrain-based bread products for increasingly health-conscious Indonesians. The principal challenge facing Australia will be its ability to reliably produce sufficient quantities of wheat with the protein levels and functionalities required by Indonesian end-users. There is no wheat breeding impediment to Australia producing improved wheat varieties suitable for Indonesia's bread and baked goods sector. However, Australia's climate variability could inhibit its ability to be a reliable and affordable supplier of adequate volumes of wheat of the desired baking qualities, especially for large-scale industrial bakeries.

Australia's potential to profit from serving Indonesia's bread market segment will require careful discussion by Australia's wheat industry. Indonesia's import demand for bread-making wheats will increase, and Australia has the technical capability to breed suitable baking wheat varieties and share in the benefits of the increased importation of bread wheats by Indonesia. However, towards 2030 Australia has a limited capacity to increase its exportable surpluses of wheat so it remains a point of debate as to whether Australia's wheat industry resources are best served by an additional focus on developing, segregating and marketing better bread wheat varieties for this segment of Indonesia's wheat import market.

The counter view is that it is better for Australia to focus on ensuring its wheat, predominately used in noodles and as blend ingredients in a range of flour types, remains affordable and functional for these more status quo purposes.

For cakes and cookies, this segment also is dominated by US WW (Western White). However, there is a reasonable volume of Australian wheat being used in cakes and cookies, blended mostly with WW. Australian wheat is often included in a baker's soft wheat flour for cakes and cookies, but it is rarely the primary grade in this segment and instead plays a supportive role due to either to its cost or lesser functional suitability. As Australia is regularly able to produce low protein wheat, especially in Western Australia, it would seem sensible to undertake some investment in developing ASFT varieties, to gauge their agronomic, economic and functional suitability for export to Indonesia. Indonesia would welcome a complementary source of soft wheat supply to support its growing demand for cakes and cookies.

Overall, there is strategic merit in Australia pursuing a share or enlarged share of relevant segments of the Indonesian bread and baked goods market that continues to grow. Part of the strategic merit for Australia is the opportunity to diversify away from almost sole reliance on the Indonesian noodle market.

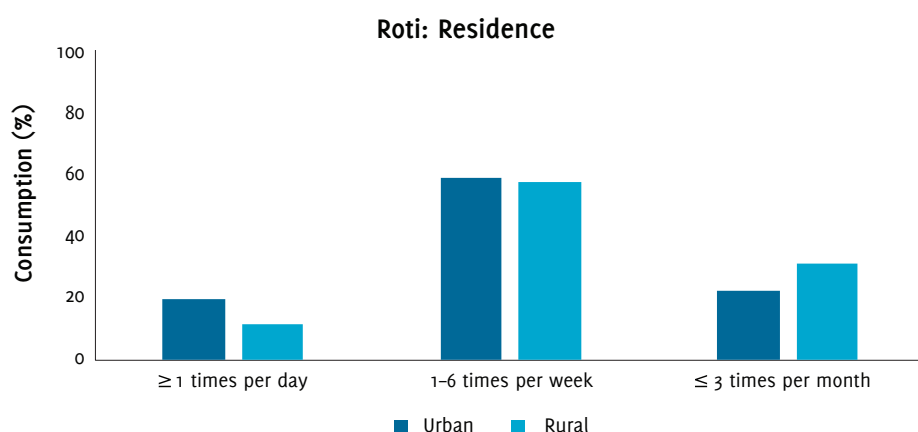
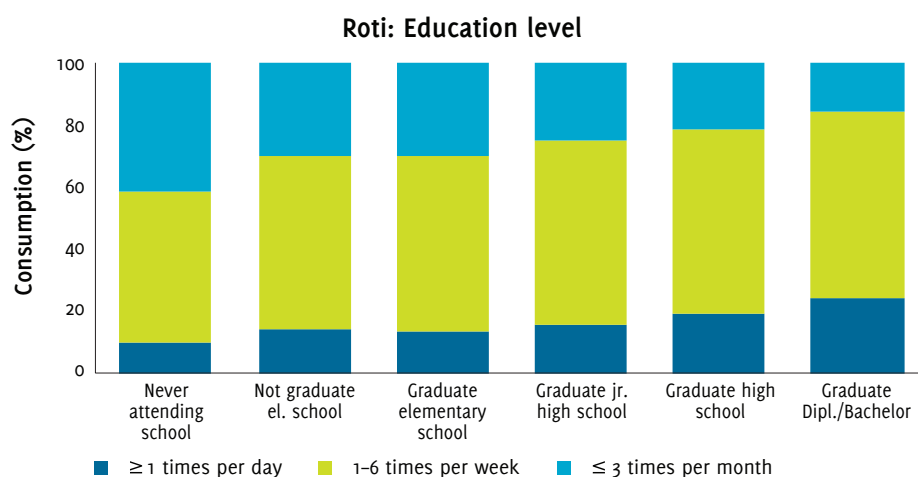
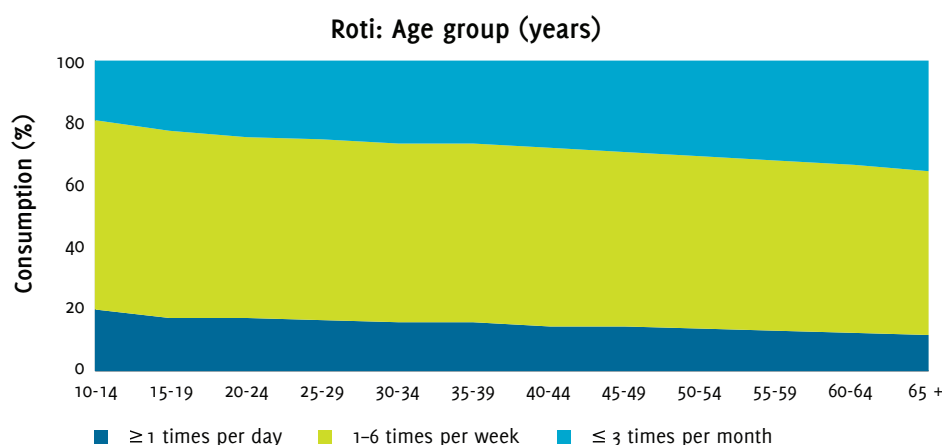
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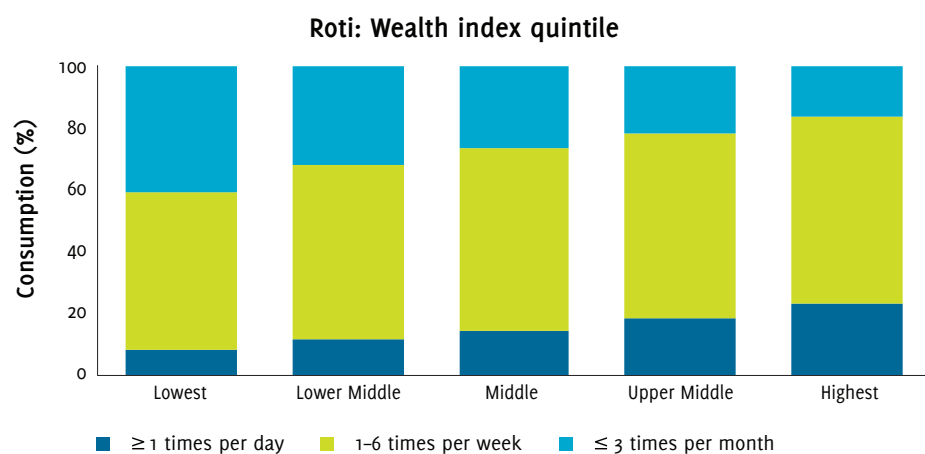
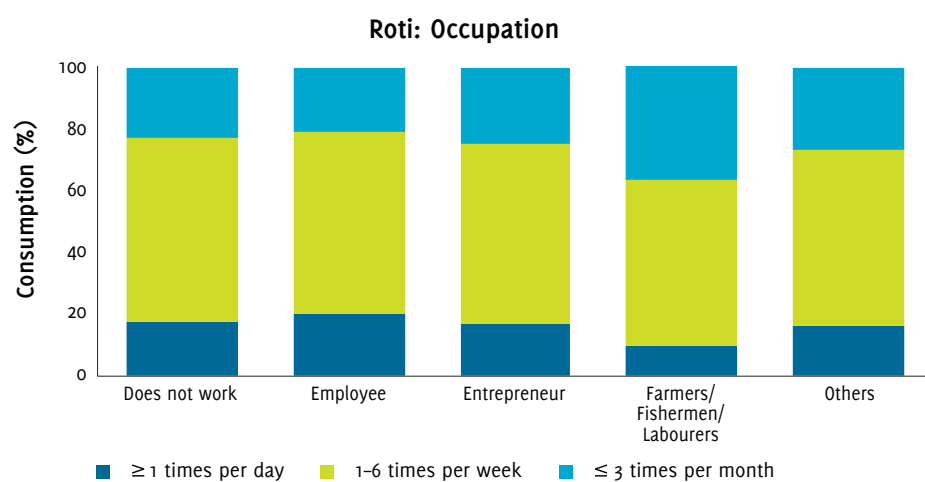
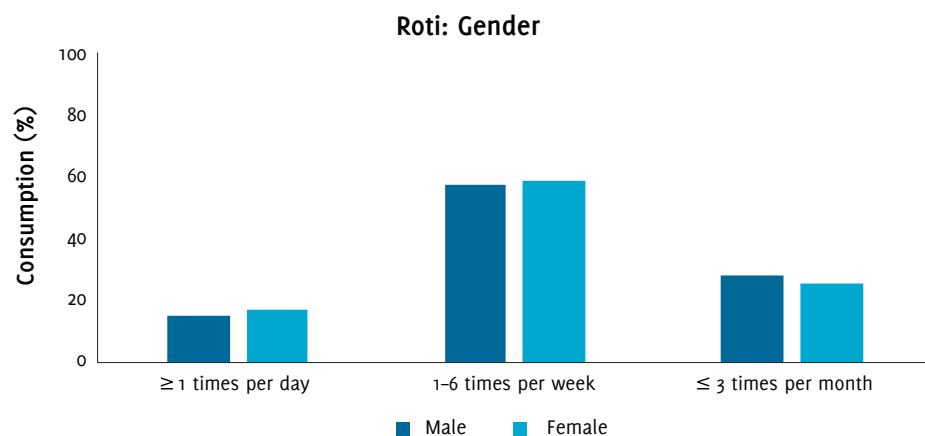
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Appendix:

Snapshot of Indonesian bread consumption in 2013

Data from the 2013 Riskesdas Survey, conducted by the Indonesian Ministry of Health, is presented below. The data is now dated, though may still provide a snapshot of bread consumption in 2013 useful to balance the interpretation of data in the main report.





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