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China's Wheat Milling Sector

How Industrialisation and State Subsidies are Driving the Transformation of Industry Relationships

Wheat is largely a policy-driven crop in China. Changes to the government subsidy regime this year might drastically alter both the availability and price of wheat for wheat millers in some regions and consequently impact major wheat flour users. At the same time, the general wheat milling industry is characterised by significant excess capacity, although most existing capacity is not the 'right kind' for the quickly growing food processing sector. This widens the gap between supply and demand of flour suitable for the modern prepared-foods industry. Scale is quickly becoming a requirement rather than just an advantage for millers, and consolidation is undoubtedly going to continue. However, the playing field is not entirely level, and the end-game will likely result in the diminished negotiating power of private millers—currently comprising the bulk of the sector—compared to a select handful of state-owned enterprises who themselves will be in both competition and negotiation with the State Reserve for supply.

Primer to the China wheat industry

Economic development and high rates of urbanisation over the last decade have altered the structure of flour consumption in China. Only five years ago, household consumption of general purpose (GP) flour accounted for over 60 percent of the market. As of the end of 2011, household consumption is now estimated below 45 percent and is expected to drop further. Europe's flour consumption for home use is only 12 percent by comparison. China's burgeoning food processing and prepared foods industries are not only changing how flour is consumed but also the kinds of wheat and milling technologies required. Millers are currently in an awkward position: they must invest to respond to the changing market but face an uncertain situation in how they source their raw material.

Wheat production in China

In the eyes of state support programmes, wheat has traditionally been defined by its colour and its planting season, while farmer payments were made on the basis of whether a variety was planted in the winter or spring, and whether the variety was white or red. On the other hand, in the eyes of the industry, protein content, test weight and elasticity for flour use (hard or soft) are the primary guiding factors.

A combination of politics, competing crops and policy have driven much of the last 10 years' worth of production towards the Huai-Hai River Plain, an area from Beijing south to the Yangtze River that includes Hebei, Shandong, Henan, Jiangsu, and northern Anhui (see *Figure 1*). This region is largely characterised by Hard White Winter Wheat and has come to represent more than 65 percent of the national market (see *Figure 2*). Within this region, Shandong and Hebei are generally considered the key sourcing zones for high quality wheat and flour for the modern food industry, while Henan is considered the primary zone for GP use and for State Reserve accumulation. South of the Huai-Hai River Plain is Red Winter Wheat country. This area accounts for 20 percent of national Red Winter Wheat output (previously over 30 percent as recently as 2000). This variety is a key ingredient for millers and flour consumers in a wide area covering Jiangsu, Sichuan and south Anhui in particular. Elasticity (in terms of flour quality) also tends to be highly variable in this region and consistency in the availability of hard or soft varieties is in constant flux. In the past, Red Winter Wheat received lower guidance prices than those of white wheat, regardless of quality.

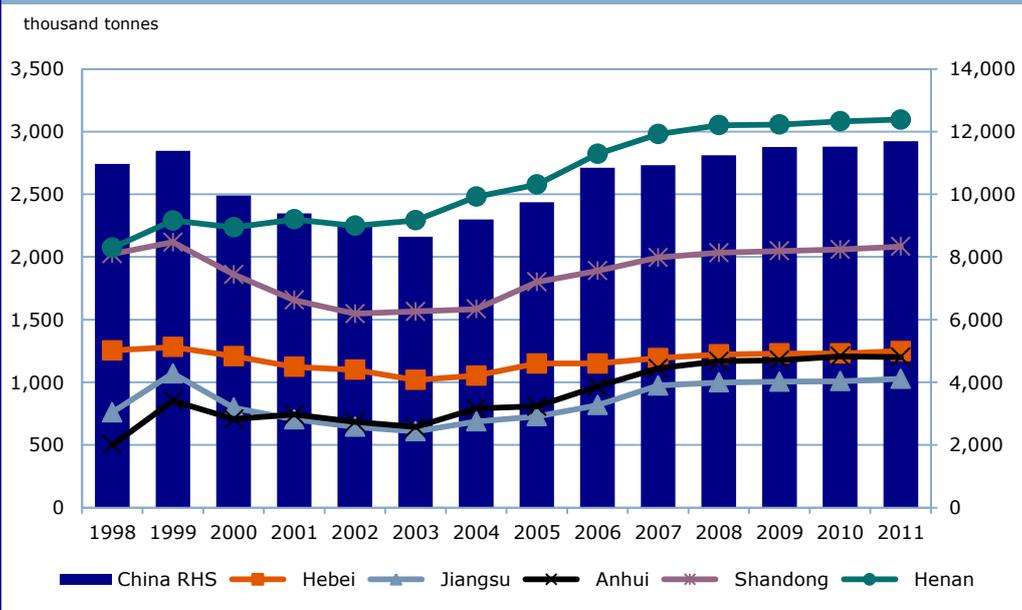
Figure 1: Wheat production in China, 2011



Source: Zhengzhou Commodity Exchange Information Service, 2012

Hard Red Spring Wheat makes up a smaller part of China's national wheat output at only 10 percent of sown area, but it also represents some of the fastest growth. Planted area is concentrated in the North East (Heilongjiang, Inner Mongolia) and in the West (Xinjiang). High organic content in the soil, especially the black soil region of Heilongjiang, means that despite high protein, milling yield for high quality flour tends to be lower and this crop has consequently been priced at a discount to Hard White Winter Wheat further to the south.

Figure 2: Wheat production by province in China, 1998-2011

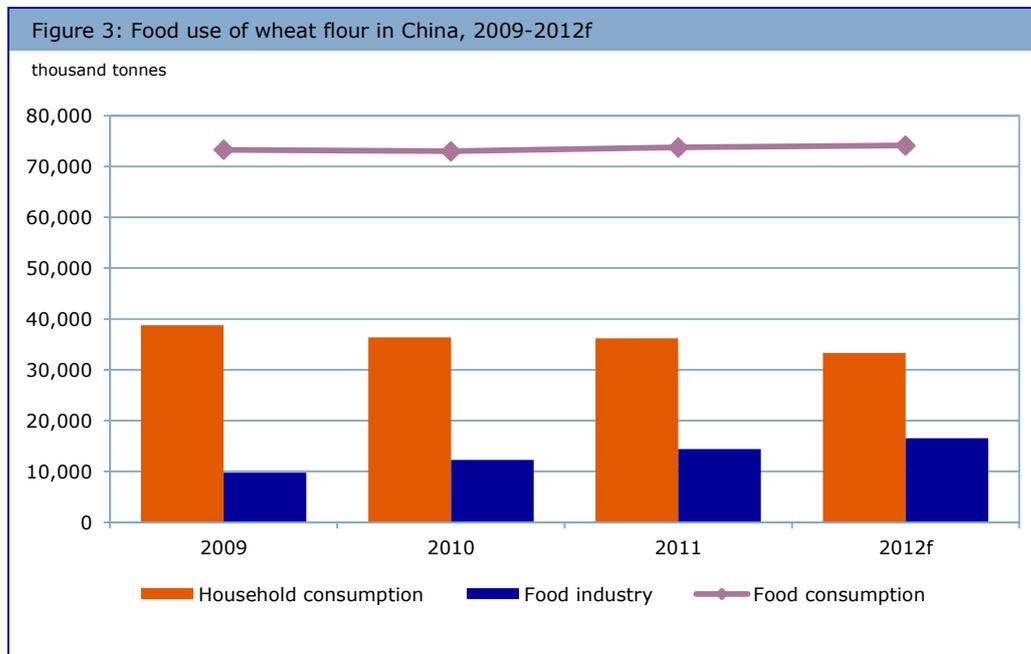


Source: China National Bureau of Statistics, 2012

Wheat flour consumer requirements and changes to the structure of demand

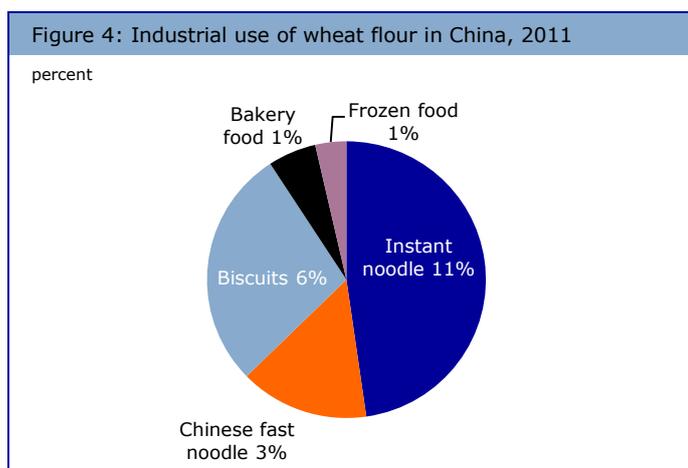
In the following sections, we distinguish 'industrial' or 'tailored' flour, for specific industrial food processing purposes, from GP flour, which has traditionally been largely for home use and hand-made production of food.

Traditionally, wheat flour of high elasticity (regardless of colour), sourced from the Huai-Hai River Plain, has been used in the production of hand-rolled noodles ('lamian' 拉面) and breads. Medium elasticity wheat flour was reserved for the most commonly consumed foods, such as 'normal noodles' (面条), dumplings, and steamed bread ('mantou' 馒头). Low elasticity wheat flour is used in cookies, biscuits and some pastry products which, until recently, were produced in low volumes in small-scale workshops. Within the food use category, 40 percent of wheat flour continues to be used for noodles (of all varieties), and 30 percent for steamed bread. Bakery breads, cakes and cookies account for only less than 10 percent of the total usage of wheat flour, but constitute the fastest growth rates in China.



Source: BOABC, Rabobank, 2012

Wheat flour production and demand has flat lined over the last five years, but this is deceiving as industrial consumption has grown by a 25 percent CAGR over the last four years, while consumption of GP flour for home use has declined (though household consumption is still the largest consumption segment in the market at 45 percent of total use) (see Figures 3 and 4). This is important to note because industrial flour production requires specific milling lines and specific wheat blends that are not necessarily readily available in the market.



Source: BOABC, 2012

Profile of China's wheat milling sector

There are over 40,000 flour millers in China. However, most mills are extremely small. In fact, over 30,000 of these mills have less than 50 tonnes of physical capacity per day and operate less than 90 days out of the year, and another 5,000 have less than 200 tonnes capacity per day. This sector effectively represents the village milling model of the past (i.e. the model that Russia, India and other countries are also transitioning from), where mills sourced locally grown wheat for household use within the immediate village vicinity. Much of this excess capacity still exists in North China. South China, specifically Guangdong province, has to a large extent made the transition to a modern industrial platform and is a key supplier to the rest of the national food processing industry. With little local wheat production of its own, Guangdong has long been dependent on imports (either inter-regional or international) for its wheat consumption needs. The large scale mills built in the province typically run at 80 percent capacity year-round and export roughly 40 percent of their flour production to other provinces, with 250,000 tonnes exported annually to South East Asia.

The situation in the rest of China is much more complex (see Figure 5). From 2005 to 2010, annual flour milling capacity effectively more than doubled from 80 million tonnes to 170 million tonnes (though we know of industry estimates even higher), which has driven industry utilisation rates down to 43 percent. This is much lower than the 80 percent seen in mature industrial wheat markets of Northern Europe, or even the 60 percent seen in the more artisanally-oriented wheat markets of Southern Europe. We estimate that over 100 milling lines per year have been constructed in the last five years, with each line having capacity of between 300 tonnes and 600 tonnes per day.

Part of the reason for this increase is not just due to general capacity expansion but also to the specific response of industrial millers to the growth of industrial users of flour (instant noodle manufacturers, producers of cookies and cakes, and quick service restaurants), who demand standardised flours with specific technical requirements relating to protein quality and elasticity that cannot vary from year to year.

Figure 5: China's wheat flour production by province, 2011



Source: National Bureau of Statistics, 2011

Yet the bandwidth of the milling channel in particular is extremely narrow. Despite significant excess capacity in the flour milling sector, there is significant under capacity and greater consolidation in the industrial flour milling sub-sector, where 100 millers represent over 65 percent of total industrial supply. The differential growth rates of industrial flour demand, industrial milling capacity and the production of wheat with the appropriate qualities have severely complicated efforts to develop the industry. In particular, with state policy guidance that emphasised production volume and wheat colour rather than wheat quality, this channel has often been forced to creatively source the desired specifications.

Bakeries and other users of flour are increasingly buying multiple varieties of GP flours from various regions (with differing characteristics) and blending them onsite to suit their own purposes. Flour millers, beset with gaps in supply for the industrial flour market, are driven towards producing batches of GP flour and then blending those batches in workshops until desired specifications are achieved or, more commonly, buying GP flours from multiple third parties and blending them onsite. There is also a significant and growing industry of 'flour improvers', companies that exist solely to blend third-party flours for sale to end-users. While this market segment does exist in Europe, it is dwarfed in size and scope by China. Those mills catering specifically to the food industry use an increasing quantity of imported wheat as millers struggle with volatility in domestic availability and achieving specific milling yield targets. With this rather haphazard approach, the Chinese wheat industry is responding to increasing demands for standardisation and specification from the food industry.

This year in particular will prove to be challenging for many flour suppliers to the modern food industry. Production in much of the Soft Red Winter Wheat growing region is sharply down due to disease infestations. The response by many producers has been to blend infested wheat into milling grades. This optimises total output and corresponds to the

support programmes this year that emphasised total output, but it also reduces the availability of milling grades while boosting feed grades.

The core of the Chinese state's participation in the wheat market has been by way of the Minimum Support Price, the price at which the State Reserve will purchase grains from producers. If quality in any given year is a serious issue and millers refrain from buying farmers' grains, those grains are acquired by the State Reserve. Thus the growing presence of the State Reserve as both originator and distributor is a central topic in any discussion of the food supply chain. Especially as some mills report increased quality concerns on grains supplied by the State Reserve.

The State Reserve's role in a policy-driven market

After seven years of continuous decline in wheat output, the National Development and Reform Commission published its 'Central Number 1 Document' in 2004 that re-emphasised the importance of agricultural production and placed it as the top priority of domestic development programmes. Wheat production was a significant beneficiary of the subsidy programmes that followed. One of the key elements of this state support was the Minimum Support Price, or guidance price, that is announced each year. If farmers find millers or other buyers unwilling, they know their production can be sold to the State Reserve system for that guidance price.

However, a key characteristic of both subsidies and the guidance price was the existence of a significant support differential determined by one factor alone: colour. Farmers of white wheat received direct and indirect subsidies that were substantially higher than those obtained by red wheat farmers, with a guidance price 6 percent higher on average than that for red wheat (*see Figure 6*). The result was an expansion in production in northern areas that were most suited to white wheat, such as the Huai-Hai River Plain (and a plateauing of the area in the southern growing areas for red wheat, where many producers had few alternatives to planting other crops). The benefit for millers in the southern growing regions, where red wheat was most prominent, was a raw material discount relative to users of white wheat in the north, regardless of the quality being sourced.

Figure 6: China's minimum guidance price for wheat, 2006-2012

Year	Wheat (RMB/kg)		
	White wheat	Red wheat	Mixed wheat
2006	1.44	1.38	1.38
2007	1.44	1.38	1.38
2008.2	1.5	1.4	1.4
2008.3	1.54	1.44	1.44
2009	1.74	1.66	1.66
2010	1.8	1.72	1.72
2011	1.9	1.86	1.86
2012	2.04		
2013e	2.25*		

*NDRC has announced an intent to raise the minimum purchase price for 2013, but this has yet to be formally fixed
Source: State Grain Bureau, 2012

New guidance price mechanism in 2012

In 2012, for the first time ever, a new guidance price mechanism not based on colour or elasticity, but strictly on hardness and milling yield, is being implemented. There are several immediate repercussions.

First, there is the potential to re-open some geographies to wheat that were previously given less attention, particularly Hard Red Spring Wheat that has been gaining market acceptance in Xinjiang and, to a lesser extent, in Heilongjiang. Consequently, this opens a new battlefield for soybean and corn acreage in regions that previously did not have to contend with wheat as a crop competitor.

Second, flour millers wanting to purchase grain directly from producers will undoubtedly have to pay a higher price for milling grades in competition with the State Reserve. Domestic traders, often locally referred to as 'farmer managers', might increase in influence as millers look further and harder to aggregate the right kinds of volume. More critically,

those flour millers in the southern growing regions that source red wheat will no longer be able to assume the raw material discount that was present in previous years. As the southern growing areas generally offer a smaller origination platform, this change is likely to have a detrimental impact on the margins of those millers who do not or cannot source outside this region.

Third, the role of the State Reserve and of other state-owned enterprises (SOE) will increase in prominence, despite the fact that the majority of the milling sector is currently led by large private players. While this is not directly a function of the change to the subsidy regime, this will add impetus to the current trend. The State Reserve remains the most important origination point for Chinese grains. In 2011, it is estimated that over 25 percent of wheat was procured directly by the State Reserve system and over 70 percent by the full spectrum of SOEs operating in the market. This is a significant increase from previous years. The State Reserve is increasingly the intermediary between the miller and producer, and if that were not enough, the manager of the State Reserve, Sinograin, has announced its own intention of expanding its flour milling and sales capability for flour.

Conclusion

The result of the factors and context can be summarised in two distinct ways. First, flour millers located in the southern growing areas whose principle output is GP flour will be at an increasing disadvantage in the market. Changes to subsidy policy beginning this year will substantially raise their purchase prices for red wheat varieties. Prior to this year, Soft Red Wheat, regardless of quality, was at a discount to other varieties simply because the state's minimum guidance price was structured this way. Beginning next season, quality wheat prices for red wheat will be increased and southern millers will pay roughly the equivalent raw material prices as their northern competitors. However, millers will either have to outbid the State Reserve to access supply, or else negotiate directly with the State Reserve for supply that could be of questionable quality. This in the context of an industry where the market for GP flour also stands to lose considerable market share in the years to come. Millers with the scale to operate in both GP and industrial segments and with presence in multiple origination zones, will have a greater range of options when it comes to originating different wheat varieties for blends and supplying those blends to industrial flour users.

Second, to achieve the larger production platform mentioned above, wheat flour millers must consolidate despite the fact that, in the short run, the blending behaviour that this drives is haphazard and volatile. Foreign investments in the sector have been restricted, so much of this incremental capacity expansion will come from domestic companies. Due to the importance of relations with the State Reserve, and as access to import markets is limited to a small number of companies that have import quotas, we believe that much of the scale will be achieved by key SOE players. In fact, the need for scale is driven as much by policy as it is by the achievement of stronger negotiating positions with grain suppliers, plus the fact that the major supplier to the industry is the State Reserve system.

Due to platform requirements, preferential access to import quotas, and restrictions on foreign investment, SOEs and select large domestic corporates are the likely primary beneficiaries of the developments in the wheat and wheat flour industries in China. They are rapidly growing their businesses in order to negotiate with the State Reserve system, which itself is expanding down the value chain into both the GP and industrial flour segments. This brings into focus one of the more bizarre characteristics of the Chinese commodity markets and the key conflicts along the agribusiness value chains: the end-game in the flour industry looks to be a battle between competing milling SOEs, negotiating with the central supplier SOE, with users of flour in the food industry anxiously awaiting the outcome.

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