



Opiniões
de Acadêmicos
Brasileiros
sobre a China

Brazilian Scholars'
Views on China

Tiejun Gu
Organizador


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CHINESE BEEF MARKET: PRESENT FIGURE AND
FUTURE PROSPECTS FOR THE SINO-BRAZILIAN
BEEF TRADE

Susanne Knoll
Antonio Domingos Padula
Guilherme Pumi
Shudong Zhou
Funing Zhong
Júlio Otávio Jardim Barcellos



Both Brazil and China are part of the association of five major emerging economies, shortly called the BRICS (Brazil, Russia, India, China, South Africa). One of the consequences of being part of the BRICS is the formation of a new wave of economic relations between members, despite no actual bilateral trade agreements yet in place. This new economic order in the specific case of Brazil and China is materialized in the intensification of agricultural commodities export from the Latin American country to Asia's biggest economy (Brazilian Ministry of Development, Industry and Foreign Trade (MDIC, 2016)), and beef is one of the main goods traded.

Susanne Knoll – Center of Agribusiness, Federal University of Rio Grande do Sul, Porto Alegre, Brazil. E-mail: susanne_knoll@yahoo.com.br.

Antonio Domingos Padula – Center of Agribusiness, Federal University of Rio Grande do Sul, Porto Alegre, Brazil; School of Administration, Federal University of Rio Grande do Sul, Porto Alegre, Brazil. E-mail: antonio.padula@ufrgs.br.

Guilherme Pumi – Department of Pure and Applied Mathematics Federal University of Rio Grande do Sul (UFRGS), Porto Alegre, Brazil. E-mail: guipumi@gmail.com.

Shudong Zhou – College of Economics & Management, Nanjing Agriculture University, Nanjing, China. E-mail: sdz6108@163.com.

Funing Zhong – College of Economics & Management, Nanjing Agriculture University, Nanjing, China. E-mail: fnzhong@njau.edu.cn.

Júlio Otávio Jardim Barcellos – Center of Agribusiness, Federal University of Rio Grande do Sul, Porto Alegre, Brazil; Department of Animal Science (Zootecnia) Federal University of Rio Grande do Sul (UFRGS), Porto Alegre, Brazil. E-mail: julio.barcellos@ufrgs.br.

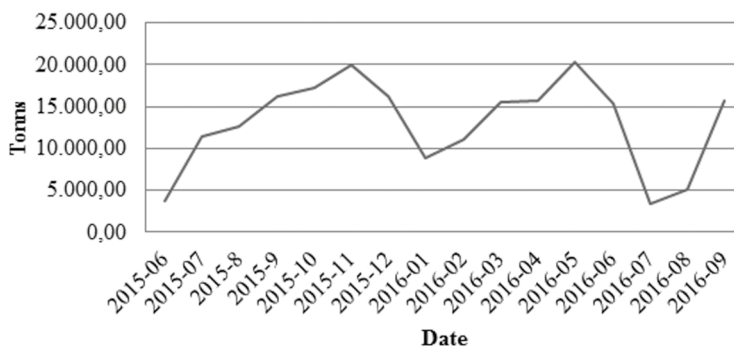


Figure 1 – Brazilian frozen beef export to mainland China (commodity code HS0202)
 Source: Authors elaboration based on UNcomtrade (2016) data.

After the Chinese trade ban on Brazilian exports was lifted in June 2015 (see the beginning of timeline in Figure 1), within few months Brazil became the dominant supplier of the booming Chinese market. While in the first months after the trade liberalization eight Brazilian slaughterhouses were permitted to export frozen beef products to the East Asian country, the volume handled was so extensive that Brazil became rapidly mainland China's greatest frozen beef provider (overruling traditionally relevant beef trading countries such as Australia, Canada, New Zealand, Costa Rica, Uruguay, Argentina). Although an increasing general tendency of growth (see in Figure 2), when looking at monthly trade volumes, fluctuations in export quantities can be detected (see Figure 1). Such linear trade disruption factors are results of administrative factors adjustment on trade and its protocols, market price fluctuation due to other countries export volumes and Chinese and Brazilian local consumption and production, slaughterhouse accreditations, and trade via Hong Kong, etc.

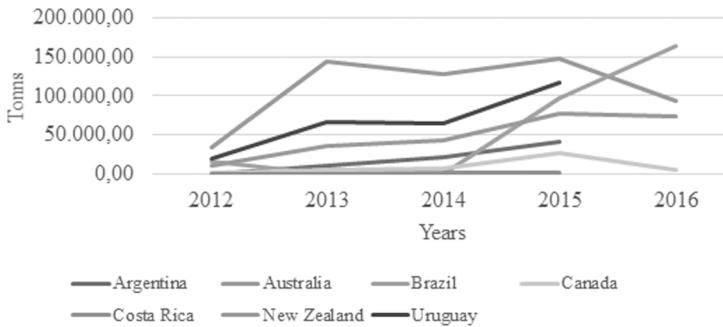


Figure 2 – The most relevant beef exporting beef trade tendencies with mainland China (commodity code HS0202)
 Source: Authors elaboration based on UNcomtrade (2016) data.

Although the Brazilian beef export to China is substantial enough to impact the world beef price, the Brazilian cattle meat industries knowledge on its most relevant foreign consumer is limited (Knoll et al., 2017a). Thus, the objective of this research is to get an up-to-date understanding of the Chinese beef market based on international literature review (written in Chinese Mandarin and English language).

Conceptual framework

To have a possibility and advantage on a geographically distinct marketplace, the understanding of the foreign market are absolute necessities to guarantee the firm economic survival and sustainable competitiveness. According to several international scientists specialized in firm internationalization and its management, information and knowledge of the foreign markets is one of the most central factors which determine the overall success of a company when going abroad (Bilkey; Tesar, 1977; Cavusgil, 1985; Johansson; Vahlne, 1977).

Entering into a new and external market comes hand in hand with several liabilities for the management (Zaheer, 1995). One of such liability is the challenge to interpret and understand the external markets

local administration, government and business partners particularities. Additionally, challenges rise from the external markets varying standards, requirements and consumer tastes preferences (Lord et al., 2000), which are mostly new information to the exporting firms. Miscalculation of such details leads to increased cost, delays in planning production, processing and delivering (Johanson; Vahlne, 1977) of the exporting enterprises. Thus, host country specific knowledge such as culture, language, particularities of society and political system are essential topics to get to know (Inkpen; Beamish, 1997; Makino; Delios, 1996). As a result, entering a foreign market is a rich and intensive learning process for a firm (Andersen, 1993; Barkema et al., 1996) where the development of a holistic and systematic market profile becomes an essential factor to its success.

To build up such an approach, Nell (2006) suggest to get a deeper inside into the topic of the foreign countries meat sector regarding following issues:

- The livestock sector and meat chain
- Marketing and financial aspects
- Regional particularities
- The new host countries import tendencies
- Consumption trends
- Constraints for development
- Role of government agencies and government regulations

Following this approach, secondary data sources and diverse market reports are used to get a deep inside into the Chinese meat market.

Method and procedures

This exploratory and descriptive study used scientific literature and secondary data to comply with the research goals. First, a collection of English, Chinese and Portuguese language fonts regarding the Chinese beef

sector were conducted. Sources such as newspaper articles were also taken into consideration based on the recentness of China's beef trade, and the general lack of up-to-date research in the field. After the data collection, the manuscript was built up upon the conceptual framework regarding market intelligence suggested by Nell (2006). Thus, the following discussion issues were developed:

- History of the Chinese beef sector
- Industry tendencies
- Policies affecting the sector
- Cost and prices of production and processing of beef in China
- Regional particularities of the beef sector
- Main logistical characteristics of the industry
- Tendencies of consumers' beef prices
- Consumption trends
- Official and unofficial trade
- Brazil's possibility based on the countries beef production profile

Results and discussion

In the following section, the Chinese beef consumption particularities and its implications for the Brazilian beef export sector are discussed in detail.

Short history of the Chinese beef cattle sector development

Before 1980, in China it prevailed large collectively governed and managed cattle herd. At that time cattle's use was mainly on fieldwork activities (animal traction), making them an indispensable object of crop production. Their butchering was banned, unless in the case of sick and injured individuals (Waldron et al., 2015). During the collectivisation in the 1980s, land in China became highly segmented. This land reform led

to an equalitarian division between each family and household in villages. Since then, the villages administrated the farmland use rights, and farmers were entitled to rent or subcontract it. However, they could not acquire or exchange it.

Currently, around 200 million rural households are involved in food production, where an average household's landholding is approximately one acre, split into an average of six to seven different plots (Pagel; Wu, 2009). Such fragmentation in the primary production leads to the surge of several small traders, agents and brokers who employ unofficial contracts and wholesale markets to get food from remote areas to the cities. These tendencies of fragmentation through the supply chains are relevant until today and are one of the main reasons behind falsification and usage of unpermitted substances in the food industry (Gale; Hu, 2012). They also represent an important barrier for up-scaling production, especially in the light of the recent country leadership efforts to boost production.

To tackle the challenges of segmentation in the beef industry, the first major central governmental subsidy targeting the primary sector, called the "Straw for Beef program" was launched in 1991. The program succeeded and millions of farmers entered the cattle breeding sector. Due to the increasing beef production related to the subsidy program, overproduction and price stagnation became a new challenge, leading to a drastic market surplus in the years 1996 and 1997. As an extra effect, larger modern abattoirs, and the "value-adding" of by-products became popular business practice (Waldron et al., 2015), originating an unfolding enterprise for many beef traders since that time.

During the period of the Chinese economic boom (years around 2000) a substantial amount of farmers switched from beef farming to other activities with faster net returns (Waldron et al., 2015). This led to a decreasing number of farmers and an increase of rural labour salaries (by 15-20 % annually). Although cattle number declined during that period, the above mentioned tendencies of intensification and value adding led to the decline in the proportion of "back yard" livestock production. In addition, specialized breeding and processing facilities steeply

roused. More recently, the industry seems to shift slowly but surely from traditional local-sourced feed “backyard production”, to a larger scale, capital-intensive farming style (Hansen; Gale, 2014). Although small-scale cattle breeding still dominates the industry, large-scale beef farming (farms which are able to produce at least 50 cattle for slaughter/year) is expanding, leading to a proportion of 27.3 % in 2013 (Chinese Animal Husbandry Association, 2015).

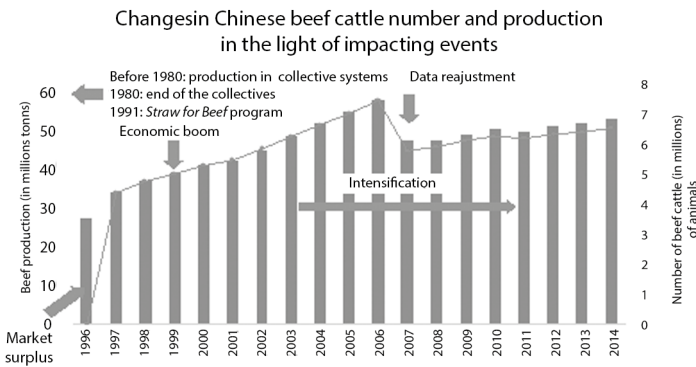


Figure 3 – Production trends and its impacts the Chinese beef industry, 1996-2014
 Source: Authors elaboration based on Waldron et al. (2015) and the Chinese’s livestock yearbook (2015) data.

Additionally to the information mentioned above, Figure 3 shows a major break in the tendencies in the year of 2006. This is the result of data re-adjustments by the Second National Agricultural Census of 2007, following a period of data over-reporting from provincial levels (Waldron et al., 2015). Similar data re-adjustments happened already in the year of 1997 and are indications of issues in a concealed data collection and reporting method in the official statistics.

Current beef industry tendencies and main production regions

In this section, the governmental policies and their effects on production are highlighted additionally to the indication of market specifi-

cations and prices in the different provinces of China. Due to the strong influence of the Chinese government on production, its interventions are one of the most relevant impact factors of the whole beef sector from producer up to retail. Therefore, governmental policies and their consequences in the Chinese cattle meat sector are discussed below.

Policies, incentives and their impact on the beef industry

Recent policy changes and support mechanisms in the beef industry are still guided by Deng Xiaoping Theory and “Three Represents” philosophy, emphasizing domestic self-sufficiency (taoniu.com, 2013).

One of the results is the joined initiative of the Chinese Ministry of Agriculture and the Chinese Ministry of Finance. Together, they launched a central financial arrangement for the development of the animal breeding sector in the year of 2014. This initiative, called Animal Husbandry Development Fund (畜牧发展扶持资金), which has a budget of around 940 million Yuan (Chinese Animal Husbandry Association, 2015) for investments related to the present Five-Year-Plan, focuses on the increase of the national beef cattle herd number. Consequently, throughout the country 15 provinces were chosen to implement a beef herds growth of more than 30000 cows. The support targets mainly beef farms that have an animal number of more than 10 head/ household. Additionally, farmers associations composed of rural producers who have 500 or more mother cows and are specialized in intensified beef cattle breeding are founded, organized and additionally supported (Chinese Animal Husbandry Association, 2015). Supplementary policies include promotion of proper semen quality utilization, determination of breeding periods, breeding standard determination, early weaning, shortening the calving interval, promotion of prenatal and postpartum feeding, and the harmonization of heat and early weaning (taoniu.com, 2013). Moreover, subsidies related to the standardization in animal and grassland health preventions, high-quality forage and crop straw utilization through te-

chnological development are greatly promoted (especially in the Western Pastoral areas of China). Furthermore, numerous dams and greenhouses are built to develop forage reserve facilities. In the southern region of the country, for instance, heatstroke-cooling and barn building systems are being implemented in order to maximize the reproduction and fertility rates and minimize the diseases and natural disaster-related losses (taoniu.com, 2013).

Considering the regional forage resource endowment, production base, slaughter and processing, and location advantages and other conditions, the production of beef cattle is expected to further accelerate and get more support in the regions of Northeast China (Hebei, Shandong and Henan) and in eight Western Chinese provinces and autonomous regions (taoniu.com, 2013). As a result, bovine beef cattle herd slightly increases and reaches around 70, 4 million animals in 2014 and will estimatedly range until 7, 86 million tons until 2020 (taoniu.com, 2013).

Cost and prices in the Chinese beef sector

In the past China has relied heavily on the market regulation in the beef sector. However, the recent restructuration to decrease market interventions has its impact on the whole industry (Chinese Animal Husbandry Association, 2015). One consequence is that the imported beef price is in several cases significantly lower than the local beef cattle's value. According to statistics in the year of 2014, China's imported beef had an average price of US\$4,32 / kg, (according to the 2014 RMB-dollar average exchange rate of 1 USD = 6.1428 Yuan), after adding the tariffs, and exchange it results in an average final wholesales price of 26.54 Yuan/kg. At the same time, China originated beef average price was 63.29 Yuan/kg, being about 2.4 times the price of imports (Chinese Animal Husbandry Association, 2015). Also, recent comparison between the same cuts from China and Brazil show a significant price difference favoring the South American biggest beef producer (See Table 1).

Table 1 – Played prices beef different beef cuts with different origin

Type of cut	Price
Sirloin (origin: China)	10,000.00 US\$/ton
Sirloin (origin: Brazil)	8,439.00 US\$/ton
Tenderloin (origin: China)	10,549.00 US\$/ton
Tenderloin (origin Brazil)	6,179.00 US\$/ton

Source: Author's organization based on meatunion.net (2016)
with an exchange rate of 1 US\$=6.6356 RMB

This Chinese local beef price phenomenon emerged due to the cattle industries' long time low-level operations and lack of proper working links between the breeding, fattening, and meat processing sector. This resulted in a tight supply of domestic cattle, and a high purchase and production price in the meat processing industry. Additionally, low coverage rate and low yield market showed weak indicators. Chinese beef industry, hence, was experiencing high investment and low production (Chinese Animal Husbandry Association, 2015).

In some of the main beef production areas of China, cattle raising and fattening price has increased. This was a province and region specific occurrence, nevertheless the largest elevation of cost happened in the northwest region of the country. There, in 2014, the total cost of raising one head of beef cattle reached 5600 Yuan, representing an increase of 253.1 % in cost since 2000 (with the major investment in feed about 65 %) (Chinese Animal Husbandry Association, 2015).

Although Chinese policies continued to boost the beef industry with benefits, in order to decrease the gap between production and consumption (with the goal to reach a deficit of 60.000 tons by 2020) (Waldron et al., 2015) expectation are that domestic meat cattle production profit margins will continue to squeeze. In addition to the above-mentioned trends, rapidly increasing beef consumption patterns are expected to stabilize and an increasing quantity of import might further compromise the general governmental goal of self-sufficiency.

Regional particularities of the Chinese beef sector

As previously mentioned, Chinese beef cattle production is mainly concentrated in the western 8 provinces (Inner Mongolia, Sichuan, Yunnan, Tibet, Gansu, Qinghai, Ningxia, and Xinjiang) and Hebei, Shandong, and Henan provinces in the Northeast China. In both the west and the Northeast, up-scaling is the latest tendency, but governmental and provincial strategies diverge from region to region. In the 8 Western provinces' farms, the output of at least 100-slaughter cattle per farm in extensive systems are the objective whereas in the 3 Northeastern Provinces farms production between 200 -1.000 slaughter cattle/ year in an intensive systems are the central government desired goal (with a budget for investment of 1 billion 300 million yuan)(taoniu.com, 2013).

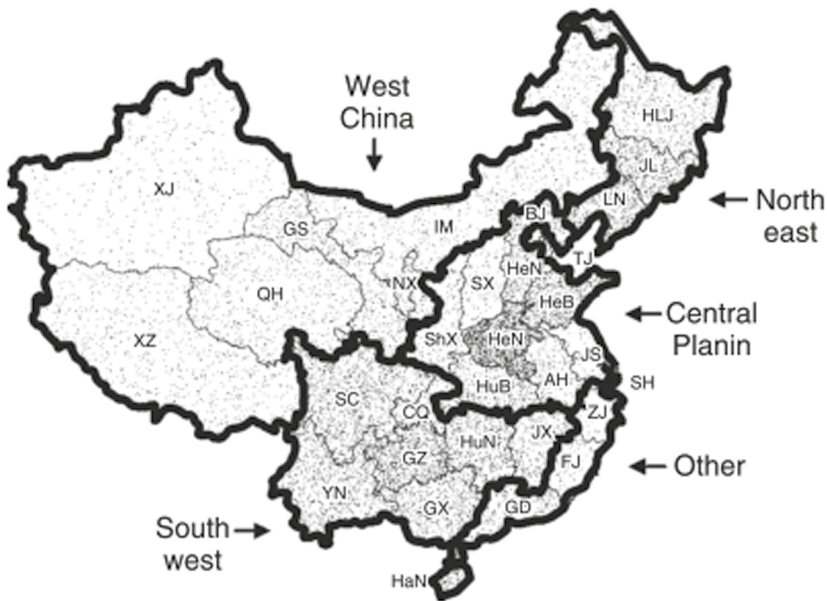


Figure 4 – Beef cattle distribution in the different provinces in China (one dot equals 200 000 cattle)
Source: Waldron (et al., 2015).

As shown in Figure 4, the three provinces, Hebei, Shandong, and Henan, are the major producing areas since 2000. These three provinces account for 30 % of the national cattle production. These regions are rich in resources. The most relevant cattle here are the Luxi cattle, Nanyang Cattle, Landraces and China Westgate towers Niu Er, and Xianan breeds. The biggest consumer markets for this meat are located close to Beijing, Tianjin, and the Yangtze River Delta. Slaughterhouses and processing enterprises in these regions have a high degree of modernization. However, they are operating below production capacity due to the quick decrease of breeding cows and the low forage resources use efficiency in the region. The main task of the three provinces, as defined by the central government, is to develop standardized scale farming. This includes development of breed adaptation to the new technology and the promotion of artificial insemination technology, strengthening of the silage expertise, promoting feed storage facilities, and the utilization of crop straw. The plan is to consolidate the traditional advantages and reverse the breeding cows' population decline to achieve a steadily boost beef production with a focus on quality improvement. The final goal of the government investment in these regions is to be able to supply the surrounding region's beef demands, in quantity as well in quality, in the large and medium sized cities (taoniu.com, 2013).

Important breeds in the Western Chinese provinces are the Qinchuan cattle, Tibet cattle, Maiwa Yak, the Qinghai Plateau Yak and Chinese Simmental, Xinjiang brown cattle, She and Datong yak breeds (taoniu.com, 2013). The big challenges in these provinces are overgrazing and low cattle breeding indicators, including low production efficiency and low fertility, in a semi-nomad production style. Pastoral extensive breeding system and crop straw dominate the area. However, fattening lags behind the development of the regional slaughter and processing level needs. Due to the already existing pastoral areas, the central governmental incentives include further crop straw resources used combined with the expansion of exotic grass-

land. Thus, the original extensive grazing profile of these areas still exist, but semi-pastoral systems and cow-calf systems are taking over (counting for around 24 % of the Chinese cattle herd) (Waldron and Brown, 2014). Fattening in these regions is limitedly encouraged, due to environmental restrictions.

Logistics and food safety in China

Although safety requirements on the quality of beef products improved substantially after China joined the WTO in 2001, in general, Chinese beef products have low quality and are associated with health and safety risks. The main challenges remain in the areas of controlling and eliminating infectious diseases, drug residues, and meat product quality standard levels (Tian et al., 2013) resulting from the highly fragmented farming profile in the country.

The Chinese beef industry could be considered immature due to its low level of the organization throughout the sector (Tian et al., 2013). Although the Chinese central government supported modern abattoirs with primary supply contracts (Waldron et al., 2015), the policy did not reach its goal to turn supply management more sustainable. Fixed and permanent supply contracts are still rare between the Chinese supply chain segments (Gale and Hu, 2012). Consequently, the great segmentation (Zhang and Aramyan, 2009) still poses a big challenge in the industry, causing extra transaction cost on several levels of the supply chain. The majority of small-scale breeders do not form part of a centralized organization. They enter the market mostly alone, increasing their vulnerability, and at the same time slow down innovation and customer response time (Tian et al., 2013). As a consequence, the whole beef supply chain is weaker in an environment of market competition.

Due to the growing public display of food safety issues emanating from both low-end national beef quality and the vast amount of smuggled beef health risks concerns have become a matter of public debate.

Although the Chinese beef supply chains health and sanitary oriented attributes improved through food safety standards (e.g. Agricultural Products Quality and Safety Law, Non-Public Hazard Foods (Waldron et al., 2015)), and rapid improvement in its laboratory technology, it is often missing on organizational improvement when it comes to logistical related issues on food (Gale and Hu, 2012).

To face these organizational problems in the supply chain, supermarkets focus their marketing strategies on own food safety certifications and traceability systems (Gale and Hu, 2012). Especial Chinese companies which are export-oriented gain higher credibility through their adaptation of international food safety standards (Zhai et al., 2009). As a result, branding, and brand reputation get a special focus in the eye of the Chinese consumer. This tendency is expressed in China even more than in any other developed or developing countries.

Chinese beef price

Beef price increased steadily since 2007, due to several reasons. Additionally to the problems in the production sector and the diversification of diet, improved living standards comes hand in hand with consumers' willingness and ability to pay higher prices. Although price increases are relatively steady over years, wintertime represents a special peak (see Figure 5) with the holidays of Chinese Spring Festival or also called the Chinese New Year. During this period of the year beef is consumed in greater quantities than in during other holidays, and with it, a price peak appears. In 2014 average beef prices reached up to 64 Yuan/kg (Chinese Animal Husbandry Association, 2015), which is at other times of the year around 55-60 Yuan/kg.

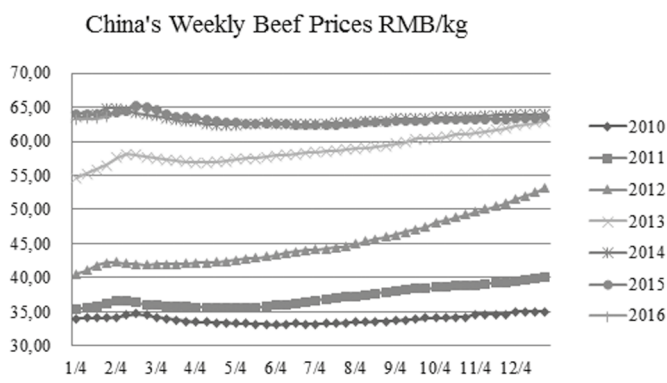


Figure 5 – Changes of beef price throughout the different years and months
 Source: Authors elaboration based on Chinese Agricultural Ministry's (2016).

Although still increasing consumption, China's recent slowdown in the economy seems to affect the beef consumption. Higher and middle-income Chinese costumers continue to seek quality beef products; however, the consumption of low-value-added beef possibly will drop (Sherrard et al., 2016).

Consumption trends

Although the annual growth rate of the Chinese economy has slowed down, it still represents 6, 9 % in GDP increase during 2015 (The World Bank, 2015). Such growth and its impact on consumption tendencies (of nearly 1.3 billion people) have an impact on the global economy and the international food trade (MICA,2017). In the specific case of the Chinese beef consumption, an annual growth of 1.28 % was measured between 2010 and 2015. According to the national population estimate, between 2010 till 2015 they expected an increased demand of 680 thousand tons, reaching the consumption of 7.2 million tons in the last year. The same study estimates that by 2020 Chinese national per capita beef consumption might reach 5.49 kg/year, corresponding to an increase of 0.3 kg/annually since 2015.

Although approximating the most realistic Chinese beef consumption data is a challenge - due to irregularities of the province based data collection (Waldron et al., 2015), and excessive differences between Chinese National Statistics and international organizations estimates - research shows significant difference between urban and rural beef consumption. Waldron and Brown (2014) estimate only 2.53 kg/capita/year consumption. However, the trade balance method shows 4,6 kg/person of beef consumed in 2010 in the urban areas. Even higher numbers are estimated by Bai et al., (2012). These researchers identified that mayor cities have a consumption between 4.5 kg and 7.7 kg, and in-home eating in the same area corresponds to a bit over 30 %. According to the China Animal Husbandry Association (2015), in 2013 China's per capita beef consumption was 5.15 kg/person. Nevertheless, the several reports with varying data, when withdrawing close attention from the search of the right number, and comparison is done on a historical base, it can be assume that around 5.0 kg/person /year beef consumption might be a close figure to reality (Figure 6).

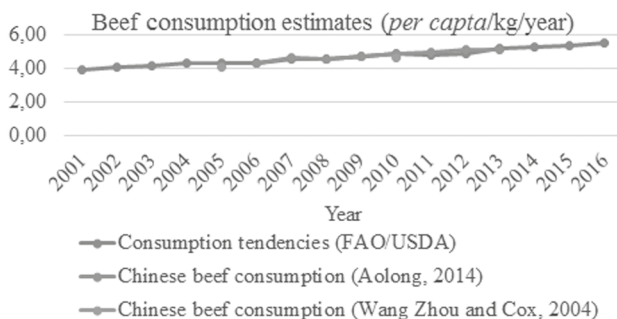


Figure 6 – Consumption estimates from three different sources throughout time
 Source: Authors design based on FAO (2012) and USDA (2016).

Currently, China has three main different cattle meat value chains, namely the low, middle and high value beef chain (Waldron et

al., 2010). In the low value chain, the fragmented smallholder farms (1-3 animals) dominate the production of the primary material, the cattle. Such fragmentation causes problems in monitoring animal sanitary and raising conditions, and also creates at the same time high product heterogeneity. The animals are mostly slaughtered under unhygienic conditions and sold in wet-markets without rigorous security, quality and standardization systems. Nevertheless, this is the most dominant value chain (80- 85 % of the consumption) (Waldron et al., 2010). The products of this value chain are purchased and consumed mainly by low incomes household members in less controlled restaurant environments.

Nevertheless, Chinese middle class experiences rapid expansion (Conforte et al., 2012), and with it elevates its desire for a safer product (Fuller and Dong, 2007). Such social classes are willing to pay small premiums for improved food safety (Waldron, 2008). The products in this value chain are based on mainly grass fed cattle, produced by small farmers, sold on wet markets and in supermarket chains. The measured values of this meat mid-value chain include attributes such as leanness and juiciness, but does not consist of fat and marbling. The products are processed in local slaughterhouses, which have enterprise owned and governmental vigilance. Due to no clear unification of beef cuts, such establishments are producing their own meat cuts, and with it bring a high product diversification and variant presentation to the consumer. Although a national beef grading system exists, it does not create confidence in the purchasers. Thus, Chinese purchasers trust more in the product description on the label of the individual processing plant, creating meanwhile a great confusion in the country-wide grading system (Waldron, 2008). Therefore, the main difference between the mid- and low-value beef supply chains lies not in the quality of beef, but rather in the safety and tractability of the product due to voluntary labeling system and the existing governmental processing controls of meat packers.

The third, so called high-value beef chain, is characterized by the demand of Chinese high-income society (5 % of the population). The expectation on attributes of beef of this kind of consumers is comparable with the *western cultures* one. Consumers call for variety and high quality products and are willing to pay for it (Waldron et al., 2010). These social classes purchase of goods are mostly done in hypermarkets (e.g. Carrefour, Wal-Mart, Metro, Lotus, Auchan and Tesco) and specialty stores (City Shop Supermarket (Shanghai), City-Super, CRV Ole, BHG (Beijing Hualian Supermarket), Hisense Plaza (Qingdao) and Jin Bou Da (Zhengzhou). The suppliers of such stores are part of a high-value beef chain dominated by modern firms with increasing vertical integration. Animals are raised in feedlot systems and are slaughtered/processed in modern facilities which are owned by general food companies or by the local government. Contracts, labeling, and traceability is a must in this industry segment, and quality characteristics such as tenderness and marbling become basic evaluation criteria (Waldron et al., 2010). Such products are sophisticated, nevertheless, labeling happens by the processing companies, without existence of homogenized quality and cut measures.

As the Chinese Han ethnic group (over 90 % of Chinas population) predominantly consume pork, chicken, and fish, historically only the Chinese Muslim minorities are associated with food products containing beef. Today, there is an estimated 23 million Muslims in the country, related mostly to 55 recognized minority groups (Junqing, 2013). Even if maybe not all of them are strict believers, one thing they kept all in common; their habit not to consume pork. Instead, they focus their diet on ruminant products.

Figure 7 displays the traditional Chinese cuts.

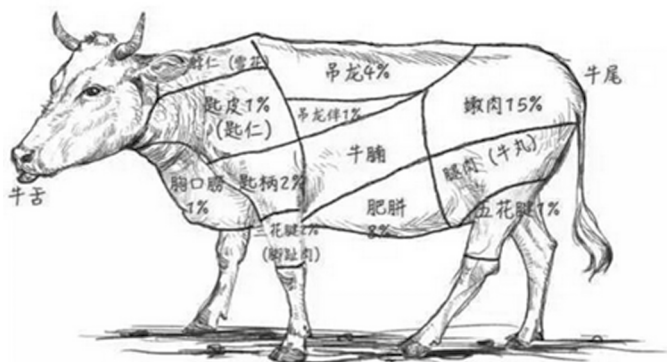


Figure 7: Traditional Chinese beef cuts
Source: 巴西那些事儿.

The Muslim religious dominance in the beef sector leads to a predominantly halal slaughter method all over China. Until today Muslim families play the major role in the beef production, processing and distribution sector leading to an estimate of 90 % in halal meat in the retail sector, independently if it is an international supermarket, a small corner wet market or the catering sector.

The traditional cuts are still frequent and play an important role in kebab, hotpot and various other ethnic cuisines, which are becoming more and more popular as part of the food diversification of a young public (age between 18-30) (Hansen; Gale, 2014). Most used cuts are beef shoulder steak, flank, bottom round (based on an interview with a specialist and Brown et al. (2013)). The beef used for such dishes are small sized pieces, spiced and usually are being mixed with sauce or vegetables. For these consumers, juiciness, color, texture and marbling of such beef cuts are not considered as relevant (Longworth et al., 2001).

Also, recent tendencies of food diversification give rise to new kind of beef preparations that match foreign barbecue stereotypes from countries like Korea, USA, and Australian. Such tendencies create the need for new beef evaluation systems and quality standards, generating the necessity of the development of a new grading system (Waldron; Brown, 2014).

Due to the lifestyle of the average Chinese consumer, beef is rather being consumed in restaurants than prepared at home (Waldron et al., 2015). Another rapidly increasing beef purchase tendency occurs through online platforms. Chinese online processed, semi-processed and unprocessed food purchase experienced a relevant growth in the past years. Online purchase is mainly done via smartphones and mobile applications by the technology-oriented generation between the ages of 18-35. Such online purchases have already become more relevant than in western countries and create new dynamics in the branding and pricing sectors. Nevertheless, for the industry branch it is still new and it is inexperienced in the wide distribution of beef. Thus, concerns and skepticism are raised by some industry representatives in relation to consumer satisfaction. (E.g. the consumer is not able to receive the same marbling and meat color like shown and promoted on the homepage is impossible. Throughout the cold chain handling and its capabilities, especially at the logistical switch points such as wholesales market to road transportation, it can happen changes in temperature resulting in varying coloration of the food.) Consequently, online sales of beef create a new trend wave of purchasing, but constant market analysis is needed in order to succeed in this retail sector (Yiguo.com, 2015).

Chinese customers become more and more aware of food health standards, thus low-fat animal proteins become increasingly popular, favoring with it the beef consumption. Yet, scandals such as injection of water into beef at slaughter and retail (to increase weight and juiciness) and growth promoters (e.g. *Clenbuterol Hydrochloride*) were headlines of the news. Such issues are relevant and current problems of the industry together with re-labeling of origins and sales of expired meat raise concerns in consumer eyes (Edwards, 2016). Nonetheless, beef is considered a relatively safe product in China due to the greater scandals in the pork and poultry industry (Frederick and Li, 2015; Longworth et al., 2001).

Beef imports and illegal trade

Chinese dependency on imports, due to reasons mentioned in the previous sections, and its particularities of trade policy, openness up two kind of imports; the official, and the unofficial ones. Thus, in the following two subsections we describe the mayor particularities of such approach.

Imports

As chinese beef production and logistic systems struggle to increase herd number and beef output. China's newly revised environmental protection law, and the "Water Pollution Prevention Action Plan" will make farmers less and less interested in the beef sector. Thus, to attend the consumer demands, import of beef to China will rise constantly (Hansen; Gale, 2014).

China's beef production and import volumes increase on year by year basis (see Figure 8). In 2015, China's total imports of beef reached 663.000 tons (with the expectation to further increase until 825.000 tons until the end of 2016).

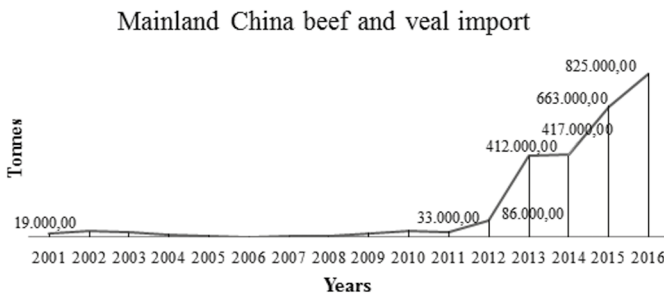


Figure 8 – Chinese beef import tendencies since the countries entrance to the WTO
Source: Authors designs based on USDA (2016) estimates

In 2015 China's main suppliers were Brazil, Australia, New Zealand, Uruguay, Canada, Argentina and Costa Rica. Other great volume beef exporters are still negotiating their market access to the mainland, and this include the USA (since BSE case in 2003), and India (recent positive Food and Mouth Disease Status), as well as other traditional beef producing countries in Europe (e.g. Ireland, England, France, Germany, the Netherlands).

Due to the latest trends on breed adaptation for feedlots systems, breeding animal and reproduction material in China, the United States, Canada, France, Sweden, Germany, Romania, Holland, New Zealand, Australia are becoming the most relevant genetics' exporters to China. Australia, New Zealand and Uruguay are the main live animal exporters to mainland China.

Regarding beef, according to Edwards (2016), brisket, shin/shank, silverside/outside cuts have been the most popular cuts by total volume, but strip loins and cuts such as ribs, rump, tenderloin, thin flank, and chuck consumption have increased substantially in the recent years. According to Edwards (2016)'s research, diversification towards smaller cuts might imply a more selective import order, which aims to attend for specific markets and greater value addition, showing new trends in meat consumption. Edwards furthermore assumes that strip loin, tenderloin and others cuts similar in nature could show the further increasing 'mid-value' market. Through his thesis work on the dynamics of the Australian beef export to China, Edwards (2016) also identified the increase of half carcass exports tendencies to the mainland. The half carcass is lower value-added products that require further processing within China. Such import tendencies could be explained by the slaughterhouse capacity underutilization due to Chinese native cattle supply and their willingness to improve their capacity utilization and prepare further processed beef products that well fit the taste of the end consumer.

As mentioned before, imports are expected to grow, and further diversification of cuts might be a possible tendency, but the exact prediction of the Chinese market in relation to imports is challenging due to

the rapidly changing consumer trends and the (for foreigners) unpredictable policy adjustments (Hansen and Gale, 2014).

Unofficial beef trade of China

The great difference between the domestic and foreign beef price attracted a substantial amount of beef smuggling (around 2 million tons a year (China Animal Husbandry Association, 2015; Guo and Liang, 2014). As shown in Figure 9, the foreign beef mostly enters via the port of Hong Kong and Vietnam, and can originate from several already accredited, and non-accredited countries for mainland China.



Figure 9 – Mainland China's most important illegal trade entrances
Source: Authors elaboration based on China Animal Husbandry Association (2015).

From the port of entry, common routes continue through the Pingxiang and Dongxing until Guangxi. From Guangxi, they are distributed to Hubei, Hunan and some other close regions. Another relevant route goes to Guangdong, where it enters the local market or is sold to the northern regions of China. According to Chinese media reports, the brisket smuggled from India has a price of 15-20 Yuan/kg, which was sold in mainland China for a retail price of 30-33 Yuan/kg (China Animal Husbandry Association, 2015). In relation to Indian meat, additional rumors exist that buffalo and cattle are walked to Bangladesh

and are processed there for further export to China (Waldron et al., 2015; Whitehead, 2014)

The problem with illegal meat, in general, is not only its impossible traceability but also its careless handling during their transportation and storage. In 2015, in one specific case A\$500 million worth of aged, thawed and rotting meat including beef was smuggled through the port of Vietnam, making the quantity and danger of illegal meat trade visible in the eye of the public (Edwards, 2016).

As part of the Chinese Central Government's anti-corruption policy measures, the combat to beef smuggling became prioritized in the latest years by dedicating 8 different ministries to the issue and actively supporting the work of the of the Anti-Smuggling Department of the Administration of Customs office. As part of such actions 27 criminal groups were captured and arrested, and a large amount of meat confiscated and destroyed in the first months of 2015 (Import & Export Food Safety Bureau of AQSIQ, 2015).

Prospects on the Sino-Brazilian beef trade

Brazil is already one of the greatest beef suppliers to mainland China with 16 plants accredited (until February 2017) in several states of the country.

Brazil's natural beef production environment is a well-appreciated fact by the Chinese private and public sector. The product scale by the industry becomes a favorable asset for Chinese traders, which, through the large volume, are able to focus their trade on few business partners. China's beef demand and the internal supply deficit was probably one strong reason to finally open up the 3 years long beef import ban from Brazil in June 2015. In addition, the general supply-demand relations, and the improvements in the Brazilian food safety systems, together with the Chinese economic growth, come hand in hand with fair beef prices. This gives the Brazilian traders and slaughterhouses the possibility of good economic margins from their Asian trade activities. Although there

seem to be a preference for big volume supply, small and medium-sized companies, both on the Brazilian and Chinese side, have a real opportunity to handle more niche market products and premium quality, with a higher flexibility and adaptation on each other's specific and unique needs.

Due to China's emerging middle class, all Chinese cities with more than a million inhabitants are a potential target market for Brazilian beef, due to the potential market size based on its middle and high class income society. Brazil has also big chances to improve its products visibility through online marketing, online sales or even direct promotion at restaurants with a good reputation, or thematic locals serving Brazilian beef of high quality.

As presented in the sections above, the Chinese beef market presents considerable opportunities for big beef exporting countries, such as Brazil, to expand their markets and revenues. "In 2016 Brazil exported 165,619 tons of beef to China (Beefcentral, 2017). The trade between Brazil and China is expected to grow in line with their respective GDPs (Squartini and Garlaschelli, 2013). Nevertheless, as shown by Tinbergen (1962) in his 'gravity model', although the trade flow between two countries is proportional their GDPs, as in the case for China and Brazil, it is inversely proportional to the distance between them (almost 17,000 Km) and the cultural and linguistic differences (The Economist, October 1st 2016, p. 73). This means that Brazil will face strong competition from Australia and New Zealand, which are geographically closer to China and are strongly associated with beef safety, quality and taste (MLA, 2016). Thus, Brazilian producers face the dual challenge of meeting the high demand presented by the Chinese beef market at a competitive cost and, simultaneously, ensuring quality and product safety levels that conform to the specific preferences of Chinese consumers." (Knoll et al., 2017a,b).

Although the Chinese trading environment favors the "*guanxi*" business culture, that can become a liability for foreigner entrants, it can be a positive asset too, if its well understood and practiced. To reach such a higher involvement on a political and private level with Chinese partners

the Brazilian beef traders need to invest in the process of building knowledge and trusted relations with the Chinese partners.

Due to the BRICS political membership benefits, both countries have a lot of options to strengthen their trade relations. Beef flow intensification could become a central point of these trade relations.

Concluding remarks and policy and managerial implications

The impacting fragmentation of the Chinese beef cattle sector is one of its main particularities, and as it seems, it also becomes one of its main handicaps. Although strong governmental investments in the up-scaling and the modernization of food sector, the beef sector is not able to reach the self-sufficiency desired by the Chinese central government. China has altogether 11 provinces that are relevant in the beef production, which is handled mostly by the Muslim minorities.

Raising production cost in the beef sector can be seen as a further issue besides the high level of the fragmentation of the sector. As a result, Chinese beef products can cost as much as three times more than the same imported goods. Additionally, consumer's trust in the Chinese products and the governmental sanitary control system regarding the safety of the products is low. This opens the opportunity for specific Chinese brands. Nevertheless, international beef traders from countries such as Australia, New Zealand and Uruguay are using their reputation as reliable suppliers to improve their market share in the expanding Chinese beef market.

Seeing beef as a healthy, safe and luxury product, the Chinese upper class is willing to pay fair and even outstanding prices for premium beef. Due to its rising income and its food diversification, the Chinese urban middle-class is the main driver of the increasing beef demand. In this relation, out-of-home-eating habits and increasing marketing measures targeting young consumers, makes the industry highly dynamic.

The current development status of the domestic Chinese beef production, with relatively high production costs, low trust in the domestic

food safety systems, great fragmentation and low synchronization all over the sector, and the insufficient domestic production, give beef exporting countries such as Brazil a real opportunity to merchandise their product. To improve its share in the Chinese beef market, Brazilian producers face the dual challenge of meeting the high demand presented by the Chinese market at a competitive cost and, simultaneously, ensuring quality and product safety levels that conform to the specific preferences of Chinese consumers (Knoll et al., 2017a).

Additionally, the Brazilian production scale, its cost and the growing importance of new strategic alliances between BRICS countries add possibilities for a sustainable beef trade environment between China and Brazil. However, the Chinese market and its political and cultural characteristics must be studied and better understood in order to optimize market access and positioning.

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