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A CADEIA DE SUPRIMENTOS DA CARNE SINO-BRASILEIRA: SUA  
ESTRUTURA E SEUS FATORES DE RISCO

Porto Alegre

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**FEDERAL UNIVERSITY OF RIO GRANDE DO SUL**  
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# THE SINO-BRAZILIAN BEEF SUPPLY CHAIN: ITS STRUCTURE AND RISK FACTORS

## ABSTRACT

As international food trade becomes global, so does the need to explore the changing organizational structure of the supply chain, its processes and inherent risks. Accordingly, this work taps into the discussion about beef trade among two of the most important emerging economies, China and Brazil, which has grown in only one year to be the major channel of product flow in the global cattle meat sector. In succinct words, the research reveals drivers, enablers and barriers to trade flow between one of the biggest beef exporters and the biggest importer globally.

As a first step, a systematic review of the Chinese beef sector is conducted. Chinese and English written literature and databases are used to draw a comprehensive picture of Asia's biggest economies cattle meat production up to its latest and ever dynamic consumption trends. The result reveals that China, due to its fragmented farming, processing, and logistical systems, and despite the governmental efforts to increase scaled production, is not able to attend its population's rapidly growing appetite for cattle meat. Therefore, certain countries, able to produce and supply safe beef products on such a large scale as Brazil, have a possibility to maximize their revenues for prolonged periods from the Asian market.

Additionally, the young Sino-Brazilian supply chain is taken under review in order to estimate the likelihood of filling the beef market gap created by Chinese production and consumption tendencies. Results show a detailed map of the Sino-Brazilian beef supply chain, and uncover that information shortage and its obsolescence are the main challenges impacting each and every stakeholders within the chain. This fact is considered a direct consequence of a traceability system in place, which is not harmonized between the countries, and which acts more like a tax based control mechanism that ensures food safety and information transparency. These two major particularities lead to a vulnerable trade channel that could collapse at any major external or internal supply chain fluctuation.

By assuming that information asymmetry is one of the major chain internal risk factors, a deeper dive into its causes and circumstances was made. A research was designed with

questionnaires and interviews focusing only on the information availability and its knowledge transfer in one of the most crucial and complex part of the supply chain: the Brazilian beef packers. The size of companies and their involvement in exports are not relevant factors in the Brazilian packers' knowledge of the Chinese market, as they have indeed a limited familiarity with it. This fact results from the non-centralized, outdated, non-reliable and untrustworthy information they are exposed to. Brazilian slaughterhouses need to invest heavily (financially, human resources, time etc.) to learn about their largest external beef market. Information regarding the Chinese market becomes therefore a competitive factor for the packers. Its absence or inadequacy limits any country based marketing strategy, and becomes a substantial risk factor on every supply chain stakeholder. This is the case especially considering the big volume traded between the two countries. Once more, the improvement of the recent traceability system resurfaces as one of the most pressing matters.

After a detailed description of the supply chain internal risk factors, and by knowing the importance of chain external factors, a macro level approach was conducted to reveal relevant country differences impacting the Sino-Brazilian beef trade. After secondary data analysis of different aspects raising from the distance between the two economies, as well as from interviews with the Brazilian agricultural attaché to China and a leading Brazilian export agencies director in Beijing (Apex-Brasil), it was discovered that differences in culture as well as politics are the major barriers at both governmental and private levels. These factors, although do not impede the regular trade flow of the supply chain at this moment, however, they considerably slow it down by taking away the attractiveness for several firms at every level of the chain.

As a result of the potential implications of the present research, suggestions for an adequate, chain specific, secure and low budget traceability mechanism enhancement are included. Also, the details for the buildup of a common information platform, which could improve marketing strategies, and boost the trust in the Brazilian beef products in China are outlined in this work. Finally, recommendations for governmental actions are made, which could support further efforts to create a sustainable trade of beef products between the two countries. Such could benefit both the Brazilian and Chinese beef sector and at the same time strengthens governmental ties between these two large emerging markets.

**Keywords:** Food supply chain, Cattle meat, Risk factors, Brazil, China

# A CADEIA DE SUPRIMENTOS DA CARNE SINO-BRASILEIRA: SUA ESTRUTURA E SEUS FATORES DE RISCO

## RESUMO

A medida que o comércio internacional de alimentos torna-se global também a necessidade de explorar a estrutura organizacional, as mudanças da cadeia da carne bovina, além de seus processos e fatores de risco. Dessa forma, este trabalho aborda a discussão de dois países emergentes, a China e o Brasil, no comércio de carne bovina, que cresceu em apenas um ano para tornar-se o principal canal do produtos no setor global de carne bovina. Em outras palavras, a pesquisa revela diretrizes, facilitadores e as barreiras do comércio entre um dos maiores exportadores de carne bovina e importadores em todo o mundo.

Como primeira etapa deste estudo foi realizado uma revisão sistemática de como o setor de carne chinês é conduzido. Literatura científica e base de dados em língua chinesa e inglesa foram utilizadas para avaliar a situação emergente, desde a produção da carne bovina até suas mais recentes dinâmicas e tendências de consumo, da maior economia da Ásia. O resultado revelou que a China, devido aos seus sistemas fragmentados de agricultura, processamento e logística, e além dos esforços governamentais para aumentar a produção em grande escala, não é capaz de atender o rápido aumento da sua população. Assim, os países, capazes de produzir e fornecer produtos seguros de carne bovina em grande escala como o Brasil, têm a possibilidade de maximizar seus rendimentos por longo prazo com esse mercado.

Conseqüentemente, a recente cadeia de suprimento sino-brasileira é observada com grande importância a fim de estimar sua possibilidade de atender à lacuna do mercado de carne bovina e tendências de consumo criado pela produção chinesa. Os resultados demonstram um mapa detalhado da cadeia de suprimento de carne bovina sino-brasileira, e determinam a escassez de informações e desatualização da cadeia as quais são questões relevantes entre todos os países interessados neste mercado. Portanto, isto é consequência direta de um sistema econômico de rastreabilidade implantado que não é um sistema de segurança baseado em compartilhamento e transparência da informação entre os países, sendo mais um mecanismo de controle fundamentado em impostos e taxas. Essas duas principais particularidades levam a um canal de



comércio que pode ser destruído de qualquer grande impacto externo ou interno da cadeia de suprimentos.

Assumindo que a assimetria da informação é um dos principais fatores de riscos internos da cadeia, uma visão mais detalhada foi destinada aos estudos das suas causas e circunstâncias. Desta forma, foi desenvolvida uma pesquisa com questionários e entrevistas para caracterizar a disponibilidade de informações e suas transferências em uma das partes mais cruciais e complexas da cadeia de suprimentos, nos frigoríficos brasileiros. Como resultado observamos que o tamanho das empresas frigoríficas e suas exigências em relação ao envolvimento com exportações e familiaridade com o mercado Chinês estão limitados não são relevantes no conhecimento das empresas brasileiras. Esses resultados surgem da falta da centralização da informação, e da falta dessa, em caso da existência da informação de ser não atualizada e confiável. Como consequência direta, os frigoríficos brasileiros precisam investir muito (financeiramente, em recursos humanos, tempo, etc.) para obter informações de um segmento a outro, e aprender sobre o seu maior mercado consumidor externo. Como conclusão, as informações sobre o mercado chinês se tornam um fator competitivo as empresas, e impedem o marketing baseado no origem do país. Ademais a escassez da informação se torna um grande fator de risco para cada participante da cadeia devido ao volume negociado. Portanto, o melhoramento do sistema recente e existente de rastreabilidade torna-se novamente um fator crucial para o elo entre as cadeias.

Após uma descrição detalhada dos fatores de risco internos da cadeia de suprimentos e conhecendo a importância dos fatores externos da cadeia da carne, uma abordagem de nível macro foi realizada com o objetivo de revelar as diferenças relevantes entre os países que causam um efeito na cadeia sino-brasileira. Após a análise de dados secundários, as diferenças observadas a partir da distância entre os países obtidas em entrevistas com a adida agrícola brasileiro à China e com o diretor das agências de exportação brasileiro em Pequim, descobriu-se que distâncias culturais e políticas são os principais condutores de complicações tanto a nível governamental como do setor privado. Este descobrimento, embora que não impeça o fluxo de comércio neste momento, desaceleram consideravelmente o fornecimento de suprimentos, e com isso retiram a ligação dos participantes atuais desta cadeia e a entrada de novos participantes em todos os segmentos da cadeia.

Como resultado desta pesquisa, sugerimos o aperfeiçoamento do sistema de rastreabilidade já existente com mecanismos adequados, seguros e de baixo custo. Além disso, também sugerimos a construção de uma plataforma de informação comum entre os elos da cadeia com a intenção de melhorar o marketing e, conseqüentemente, a confiança nos produtos brasileiros de carne bovina na China. A implementação de ações governamentais para implementar e viabilizar o aperfeiçoamento do comércio resiliente e sustentável dos produtos de carne bovina entre os países é de fundamental importância, beneficiando assim tanto o setor da cadeia da carne bovina brasileiro e chinês como fortalecendo os laços governamentais entre os países.

**Palavras-chave:** Cadeia alimentar, Carne bovina, Fatores de riscos, Brasil, China

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**CHAPTER I. – INTRODUCTION, PRESENTATION OF RESEARCH PURPOSE,  
JUSTIFICATION AND THEORETICAL FRAMEWORK**

## 1. GENERAL INTRODUCTION

As international food trade becomes global, so does the need to explore the shifting organizational structure of the chain, its changing processes and business practices. Conceptually, these variations in the worldwide food system are analyzed from two main angles.

Firstly, based on economic governance, regulation and globalization theories, global value chain analyses aim to understand the dynamics up and down stream of the “physical separation of different parts of the production, distribution and commercialization processes” by studying different forms of inter-firm coordination (GEREFFI et al., 2005). Further interpretation is done by the evaluation of the role of food safety, private/public regulation and quality standards (GEREFFI and LEE, 2009) and management practices reducing frictions during the integration of production processes to global chains (VIEIRA and TRAILL, 2008).

Secondly, equally relevant to these coordination and normalization perspectives are those studies, which alternatively or complementarily, correlate enterprises and their bargain position, vis a vis business performance, local effects, chain resilience, global effects and system effects or ‘development outcomes’ (GEREFFI and LEE, 2009; GIBBON, 2003; SWINNEN, 2007).

While these two perspectives provide insights about what kind of production, quality, and possible distribution standards exist across suppliers and how their business strategies are deployed (GIBBON, 2003), little is known about how these strategies are managed by multiple chain players with different economic, cultural, administrative and geographic distances. Therefore, this research serves as a systematic approach on an almost undisguised but increasingly relevant issue that entails Brazil beef exports to China.

Due to the scarcity of information available and related accessibility barriers to reliable data, the research is based on explorative qualitative approach. From the epistemological perspective, an inductive build up of the study matter was chosen to understand the contemporary phenomena of the Chinese and Brazilian beef trade. As a consequence, the logic of research is constructed in a way that specific results and validity claims are linked to organizational concepts after the data is collected (STRAUSS and CORBIN, 2008). Such bottom-up approaches, have become popular in recent agribusiness literature where information availability is a challenge, due to reasons such as: recentness of event, difficulty to measure the investigated matter, classified data etc. (BATJES, 2014; KLUGMAN and MUSANGO, 2016).

A positivist philosophy was chosen to analyze and present the results shown in the different articles. The positivism contends that observation, objective data collection and fact interpretation are the base of the creation of trustworthy research results. The positivist approach has as the main goal to analyze recent events, and from it predict future ones (SILVERMAN, 2006). As shown by MASLOW (2011), the positivist philosophy becomes useful due to its possible application in similar areas of food trade. Thus, empirical observations and measurement are in the center of the investigation. Regarding the validity of the research, the researcher uses triangulation between previous and recent records and its confrontation with primary data and theory to advance claims or conclusion in each article.

Lastly, it is important to say that due to the article-based structure of the thesis, each manuscript contains its separate introduction, research question, theoretical framework, its detailed methodology, and result discussion and conclusion sections. These manuscripts are interrelated due to the build up of the systematic research approach detailed in the section entitled “Methodology.”

Likewise the article-based thesis present mismatches between the journal requirements and the Brazilian Association of Technical Standards (ABNT). This can hinder the readability of this work, however is an issue that is beyond of control.

## **2. RESEARCH GOAL**

The main goal of the research is to identify which variables in- and outside the chain generate risks for the Brazilian-Chinese beef flow, by using a systematic assessment approach on its supply chain.

In order to meet the main research objective the following specific goals were defined:

- A. Get a deeper insight into the Chinese beef market in order to comprehend the consumer and its countries point of view.
- B. Map the Sino-Brazilian beef supply chain in its most recent form, to be able to detect its structural weaknesses and its possibility to attend the Chinese consumer needs.

- C. Get a deeper insight on the main shortcomings of the supply chain structure in order to formulate improvement suggestions, and with it improve chain sustainability and resilience.
- D. Understand the differences between the two countries, which might trigger trade complications and demonstrate additional risk factors emanating outside the supply chain.

### **3. JUSTIFICATION OF RESEARCH**

As shown in the introduction, we venture into a specific field of research, where we detected lack of literature in particular areas of academic papers, and management literature. More specifically:

- Although the field of supply chain is well-researched, the most common area in literature was during a long period mainly based on examples and studies of the electronic industry (THOMAS, DOUGLAS; GRIFFIN, 1996; NORRMAN, 2004; NAGURNEY, 2005; GU,2014). The focus was instead directed to the dynamic of the food transnational chains on a holistic view in order to contribute to the emerging literature on global food supply and its relation in the area of food transitions.
- Both Brazil and China are part of the economic block called the BRICS. Trade between BRICS (Brazilian, Russian, Indian, Chinese and South Africa) and developing countries received increasing attention by literature in the recent years (HANSON, 2012; PENG et al., 2008). Thus, our work will contribute to a scarce but developing area of works by examining partners in trade representing industrializing countries.
- Brazil, the greatest beef exporter in the World, received numerous international critics related to product safety, environmental and social responsibility along the whole chain (GREENPEACE, 2009) affecting various sectors in several countries. As a response to such concerns, and at the same time, in the light of the Brazilian export-oriented

governmental policies, there is need to get a deeper insight into problems and risks connected to different segments in the country's cattle meat supply chain. By highlighting the fragilities therein, we may incentivize chain governance and public policies to respond and make the beef sector more sustainable from an environmental, economic and social point of view. Thus, the mapping and deeper unified understanding of the export sector brings enrichment not only for literature, but also for the whole sector, helping policy incentives to tackle major issues and improve reputation of Brazilian beef.

- China is the fastest emerging beef consumer on the globe, due to socio-political and economic aspects, and not least, due to food safety related concerns. Although there exists research on Chinese consumption patterns, it mainly focuses on soy, corn and its derivate (CHUNG et al., 2012). Works dedicated exclusively to beef consumption and import to China are still a rarely handled issue in English written literature. Thus, understanding of the Chinese market will contribute to both literature on and governance in the chain, in order to avoid false estimation of this diverse and particular Asian market.

In the literature review, information was summarized which gave the fundamental ideas for our research questions. Thus, in the following subheadings a basic summary of the sources used is given. A more detailed and research case specific overview of the scientific background is provided separately in each chapter of the thesis.

## **4. THEORETICAL FRAMEWORK**

### **4.1.SUPPLY CHAIN AND ITS MANAGEMENT**

Through time, several researchers worked with the analysis of the supply chain, which resulted in an excessive amount of literature addressing the term from various angles (FOGGIN et al., 2004; GATTORNA, 2006; NORRMAN and JANSSON, 2004; THOMAS, et al., 1996), having a side effect of excessive amount of definitions, not necessarily consistent with each other (RITCHIE and BRINDLEY, 2007). Thus, it was decided to use a classical and often cited approach of CHRISTOPHER (1998), stating that the supply chain is a “network of organizations

that are involved, through up and downstream linkages in different processes and activities that produces value in the form of products and services in the hand of an ultimate customer”.

According to MENTZER et al. (2001) supply chains are phenomena that simply exist in business, meanwhile supply chain management (SCM) is an expression which requires management efforts of organization in the chain itself.

The term SCM first appeared in 1992 when OLIVER and WEBBER (1992) used it to describe unification of several functions of logistics and manufacturing based operations as a result of the intensification of global-scale industrial organization. Later, it is further specified like a holistic management of integration and coordination of material, information and financial flows (HANDFIELD and NICHOLS, 1999). AITKEN (1998) began to describe the management of the supply chain with a larger network approach by the definition of SCM as a network of interdependent organizations, where the supplier reaches the end users through a collaborative work of the control, management and improvement of the material and information flow. By separating upstream and downstream relationships between suppliers and customers CHRISTOPHER (1998) characterizes the chain management under segregation. As defined by LAMBERT and COOPER (2000), supply chain management is the incorporation of key business processes from end user through suppliers. It provides products, services and information that add value for customers and other chain members under particular organization.

#### 4.2.RISK FACTORS IN SUPPLY CHAINS MANAGEMENT

Risk can be described as measurable form of incertitude, created by the combination of uncertainty and impact (MILLER, 1992). Its management includes identification, analysis and assessment, communication and the control of such (HOLZBAUR, 2001). However, STARR et al., (2003) state that classical risk and risk management is based on enterprise risk management. Therefore, its implementation in complex network systems failed in great numbers.

In the supply chain context, risk management events are formulated based on their probability of occurrence and their related consequences (KERSTEN et al., 2007). Defined slightly differently MARCH and SHAPIRA (1987) state that as “a variation in the distribution of possible supply chain outcomes, their likelihood, and their subjective values”. Another famous scholar specialized in supply chain risk and its management states that risk in the chain is an



occurrence which the given company and stakeholder cannot deal with (ZSIDISIN, 2003). When following the indications of PECK (1996), working with supply chain risk management, it is preferable to approach the issue as an open interactive social system instead of a business process on enterprise level. Based on Peck's theory, supply chain is managed by individuals, where every member of the chain sees the management through its own eyes, and has its own idea and measures for it. Consequently, in practical terms, a patchwork theory and methodology of analysis and control is needed in order to develop the best possible approach to understand it. Both CHRISTOPHER and PECK (2004); JÜTTNER (2005) defined 5 risk categories in SCM, namely supply, process, demand, control and environmental risk. Uncoordinated processes and misalignments in the structures of the chain create the weakness to react to these five main categories of jeopardy. Thus, during risk management of the chain, the segments, which are the most risk perceptive, need to be identified in order to stop their endangerment of the chain and its environment as a whole. When categorizing risk HECKMANN et al.(2015), firstly base their definition on the overall objectives of the firm, and the supply chain. Then they specify different categories of it based on the chains ability to handle such impact, and the time the occurrence of the risk and its handling takes. Thus, there are different approaches to handle and manage risk in the supply chain. However, one thing becomes a necessity, to adapt a risk management strategy chain wide.

In order to demonstrate the impact of risk factors on supply chains, one of the most famous examples from the technological world regarding risk and its management comes from the companies Nokia and Ericsson. When the Philips microchip plant in New Mexico had a production breakdown due to a fire, destroying, a substantial amount of the company products (mainly mobile phone chips) their biggest costumers Nokia and Ericsson had a problem. Nokia, under these circumstances, due to its risk and supply chain management strategy, was able to switch suppliers quickly, and could go on with its production. Ericsson, on the other hand, trusted in its main chip supplier's recovery, and did not take any kind of sourcing actions with other producers. This management strategy forced Ericsson into its knees and made the company lose its market share, where Nokia had a rise in its profits by almost 50% that year (NORRMAN and JANSSON, 2004).

### 4.3.FOOD SUPPLY CHAINS

Food supply chains, differing from other supply chains have particularities, which profoundly impact chain management, governance, and organization. Such can be summarized as shelf life limitations due to the perishability of products; long production time, due to life cycles, seasonality and distinct and varying physical product features impacting quality and quantity due to natural environment. Food products additionally require special conditions for transportation and storage. Also, the right handling of the product impacts directly food safety and with it becomes a matter of national security (ARAMYAN et al., 2007). Furthermore, due to the recent consumer awareness (resulting from increasing transparent food policies, firm marketing strategies, media responsiveness and education) new demand raised on food quality, safety, integrity, services and diversity (VAN DER VORST et al., 2005). For instance, the use of pesticides, and agro-toxics influences the clients purchasing attitude, as much as the discussion regarding animal welfare and genetically modified organisms (RENTING et al., 2003). Another factor which raised consumer awareness since the 1970's are the permanently appearing global food scandals, beginning with the *encefalopatia espongiiforme bovina* (BSE) crisis in England and the USA, through the baby milk and bird influenza scandal in China, and the European crisis of food traceability during the horse meat incident, and the vegetable intoxications. Thus, under such circumstance, gaining, and regaining consumer trust is one of the biggest challenges of the recent and future food industry (VERBEKE et al., 2010).

Additionally, in the light of mass production institutions (governmental or private) got a growing role in regulation of the quality and safety of the products through standardizations and development of measurable and objective parameters. However, such institutions were strongly attacked by consumer groups asking for new alternatives (RENTING et al., 2003).

An additional food trend emerges, and this time it is led by the fashion industry. Such brings with it also a new kind of dynamism previously unknown to the food sector. Food becomes a symbol of lifestyle and status. Thus, by breaking away from the common and usual qualities and attributes of diet, now and in the future, design and personalization of food beverages will be added as an extra feature to be judged by the consumers (KIM et al., 2011; RITCH, 2015).

#### 4.4.IMPORTANCE OF INFORMATION IN SUPPLY CHAIN

In the recent and future supply chain and its management, suppliers and customers must be viewed as partners to improve products and satisfaction. Therefore, cooperation and integrated coordination becomes a crucial element of this symbiosis. Information, and its sharing becomes a basic asset of today's supply chains (ZHANG et al., 2004).

Supply chain shortcomings mostly occur due to lack of information, and can have results such as fluctuation of order and challenges in decision-making on the managerial level. Such can lead to late deliveries, over or under-source utilization, stock holding and can produce additional waste (LEE et al., 1997). Problems of disconnected information systems or information island (data only available for a small group of stakeholders) lead thus to a non-efficient, unsustainable and non-resilient supply chain environment (FANG and LIU, 2007). The lack of, or the inadequate handling of information has its greatest impact however on the quality of the product manufactured and processed through the chain. Consequently, supply chains, which emphasize or want to target high quality standards need as a basic necessity an adequate information management system to effectively communicate with stakeholders throughout the whole chain (WANG et al., 2007).

On the other hand, its sharing can reduce costs along the whole supply chain throughout the improved decision making base on orders, capacities, time, allocation, planning of materials used etc. (SWAMINATHAN et al., 1998; TAN, 2001).

It is important to keep in mind, however, that the cost of information, its applicability, or the handling of its technology might disable some stakeholders to be part of it. Also, data transmitted through the information channels might be unreliable, imprecise, or out-of-date in some cases, making it worthless, or even, confusing (SWAMINATHAN et al., 1997).

Effective application of information management has nowadays several technological tools and forms at its assistance (service-oriented architecture (SOA), RFID, agent, workflow management, and the Internet of Things (IoT) (XU, 2011)). Such, especially in the food industry, have gained increasing support and application due to their possibility to share relevant knowledge regarding supply chain operations and have become an essential to minimize food borne diseases and further negative impacts of the aliments.

#### 4.5. TRACEABILITY IN FOOD SUPPLY CHAINS

Due to food safety scandals such as dioxins in chicken feed, *food-and-mouth disease* (FMD) additionally to foodborne illnesses such as *salmonella*, *campylobacter* and *escherichia coli*, there is a cry out for a method and way to insure food security and at the same time restore consumer trust (BEULENS et al., 2005; REGATTIERI et al., 2007; TRIENEKENS and ZUURBIER, 2008). One solution to prevent such outbreaks is seen in the wider application of traceability systems.

Traceability is an instrument to observe, and control the regulations of food safety and quality. Due to its role as a control system it can help to improve care of aliment handling, while strengthening customer confidence at the same time. Additionally, if well designed, it can be used as a communication medium throughout the whole supply chain, from the producer to the consumer, and back (KHER et al., 2010; REGATTIERI et al., 2007). Throughout time, several organizations and authors defined traceability in different ways. In accordance with one of the most famous private certifying organization ISO 8402 (ISO, 1994) - related to quality standards - traceability is “the ability to trace the history, application or location of an entity by means of recorded identification”. This differs from the definition by the European Union (regulation 178/2002) (EUROPEAN UNION, 2002), which states that traceability is the ability to track and follow food products and every product relatable with it (animal feed, food-producing animal, food additives etc.) through all stages of production, processing and distribution. The CODEX ALIMENTARIOUS COMMISSION (2011) describes traceability as the capability to track the movement of specific food across diverse stages of production, processing and distribution. A further definition has been developed by representatives of academic research, namely OLSEN and BORIT (2013), who state, that traceability is the facility to access information throughout an entire lifecycle of a product.

Food traceability has mainly three objectives: to develop and improve supply chain management, to ensure food safety and quality through tracking and add value and visibility to the food product over differentiated marketing (AUNG and CHANG, 2014). Past these factors, and from firm specific point of view, the improved information flow across the chain can lower distribution costs, reduced recall expenses (GOLAN et al., 2004), enhance the raw material

qualities (GALVÃO et al., 2010) and further improve competitive advantages due to better inventory management (ALFARO and RÁBADE, 2009).

In many countries and especially in China, food fraud moved into the focus of the public attention and with it became one of their greatest worries (GALE, 2017).

Therefore, demand increases on evidence of product origin, processing, retailing and final destination of foodstuffs (BERTOLINI et al., 2006; PERES et al., 2007). In such food environments differentiation via reliable and traceable material flow brings additional potentials of marking and with it development of trust in specific brands.

#### 4.6.FOREIGN MARKET ENTRANCE MODES

Firms in developing and industrializing countries increase their trade volumes with foreign markets. Companies from these countries raise their interest in global economy and international venturing due to many reasons. One of them is their particular advantage of being more competitive than firms from developed countries in aspects such as: large scale of production, lower production costs and their vast experience in operating in dynamic markets (BONAGLIA et al., 2007; BUCKLEY et al., 2007; LUO and TUNG, 2007). Another reason developing and emerging economies firms' internationalization desire becomes more and more expressed lies in the poor institutional environments and market imperfections in their home markets. Therefore, by trying to reduce costs associated with transactions and uncertainties on local levels, foreign market's environments create tempting alternative target markets for companies from developing and emerging economies (LUO et al., 2011; WITT and LEWIN, 2007; YAMAKAWA et al., 2008).

From a strategic entry point of view, firms enter external markets due to their search for profit maximization coming from their firm specific advantages (CAVES, 1971; PORTER, 1986; ROOT, 1987). When entering external markets, information and its availability to a firm plays a key strategic role. So, companies investment (financial, time, human resource etc.) in information acquire becomes a central issue of internationalization (PETERSEN et al., 2008). According to Johanson and Vahlne (1977) lack of information regarding culture and knowledge, due to all its effect and factors, becomes one of the most impacting barriers for foreign market

entrance. Such, according to the authors, can be overcome by experience, time and financial investments.

Entry mode becomes a crucial aspect in a firm's success or failure during its international expansion, and these strategies are difficult to change or correct afterwards (PEDERSEN et al., 2002). Thus, the approach needs to be carefully studied and evaluated by every enterprise willing to enter distant economies.

The possibilities are various, however, the most common ways are through joint ventures, with exclusively owned subsidiaries (greenfield investments or acquiring a new company) or contracts (BROUHERS and HENNART, 2007). The difference of such mainly depends on the firm's motivation regarding the foreign market, its own resources and strategies and its risk evaluation (LI, 1995). According to PORTER (1997) several joint ventures fail due to their highly complex management, which hinders the efficient decision making and coordination for all parties. BURGLEMAN (1983) argues, that new ventures and the full commitment of a firm in a foreign environment are risky, due to limited experience of firms regarding the new market circumstances. In some other cultures, contracts might not be a reliable source of cooperation with supply chain members, due to other more traditional and higher valued business methods. An example for such are cultures like China where trust and networking power makes signatures on deals an existing, but not the most respected form of governance (ZHANG and ARAMYAN, 2009).

Thus, whichever foreign market entry mode a firm chooses, it needs to be prepared for the risk and challenges the extraterritorial environment holds.

#### 4.7.INTERNATIONAL BEEF TRADE

Due to the globalization of economies, beef supply chains become increasingly international, too. Consequently, supply chain segments (for example producer and slaughterhouse, slaughterhouse and consumer) become geographically increasingly distant from each other (MEYFROIDT et al., 2013). Nevertheless increasing distance between chain segments can have several benefits. In the specific case of the beef sector, fair international prices for consumers, higher food safety level due to adaptation to international standards, or a more competitive local beef production can be some of such. Nevertheless, on the down side,

countries can also fall into import dependence due to the external nations suppliers competitive advantage based on more favorable environmental, political, socioeconomic, technological or institutional circumstances. This superiority of external suppliers can endanger the existence of the local production and processing industry (KASTNER et al., 2014).

Thus, the challenge of the global beef trade is to satisfy external markets and consumers' requirements and desires, and, at the same time, remain a safe, environmentally and socially responsible sector (ROBINSON et al., 2011).

Additionally to its mentioned attributes and challenges, beef consumption elasticity can serve as a welfare indicator of a country (CORNELSEN et al., 2015) resulting from its interpretation as a high price meat product. On the other hand, this same particularity makes it one of the most vulnerable aliments to external and internal supply chain shocks. Accordingly, effects like climate and environmental disasters (such as floods and draws, disease outbreaks, industrial accidents (EASTERLING et al., 2000; HOSTERT et al., 2011) can have the same negative impact on it as policy alterations (e.g. changes on trade agreements, land reforms, subsidies, or conservation patterns etc.). (MÜLLER et al., 2014). Therefore, efficient logistical networks, information flow over traceability besides enhanced risk management and responsiveness have become essential parts of any international beef trade channel.

Historically, the United States (US) was the dominant international beef producer and exporter. However, after a proven case of BSE, in 2003 many countries applied long lasting bans on the US (some of the main impacting ones are economies such as Russia, China, the European Union etc.). The detection of such disease led to a strong decline of the United States' beef export volume within a short time (USITC, 2008). In Europe, A similar disease outbreak resulted in Mass slaughters and a halt in beef trade in Europe. Thus, beside the US, another major beef exporter declined his global market share. As a consequence, at around the year of 2000, South American countries became recognized global players in the international beef flows, with a particular focus on Argentina (USITC, 2008). Nevertheless, as chain reactions to consumption and policy interventions resulted in high domestic beef prices, the export of Argentinian beef became irrelevant in the international competition since 2005. This occurrences, gave an optimal ground for the up-scaling of Brazilian global cattle meat export, and made it a well-recognized country of origin on world scale (SCHIERHORN et al., 2016). Whit the boom of beef export activities, Brazil put a great emphasis on its foreign agricultural product trade, which counts

today for around 7% of the Brazilian gross domestic product (GDP) (MILLEN and ARRIGONI, 2013).

#### 4.8. THE BRAZILIAN BEEF AND ITS EXPORT SECTOR

Brazil is one of the biggest cattle herd owners on the planet with reaching a herd inventory of 212,3 million animals in 2016 (IBGE, 2016). Socio-environmental conditions, constant improvement of herd health (vaccination programs, animal welfare), upgrading of production practices combined with policy incentives (favorable bank credit, support for small, medium, big sized companies) lead to more efficient production (MINISTÉRIO DA AGRICULTURA PECUÁRIA E ABASTECIMENTO, 2013; SILVA et al., 2014).

Eighty percent of the cattle herd is raised in a pasture based feeding system, on medium to low fertility soils (FERRAZ and FELÍCIO, 2010) resulting in seasonality in the industry. The remaining percentage of the animals is part of a mixed semi intensive system, kept 82% of their life on pasture and being afterwards finished in feedlots. Brazilian beef production is a low input industry (estimated 60% lower than in Australia and 50% lower than in the United States), combined with a low efficiency (compared to other big beef producing countries such as Australia and the USA) (FIELD, 2007). Nevertheless, beef farming in Brazil is seen with an increasing business and management approach (OAIGEN et al., 2013) due to internal and external market trends and responses to research and educational approaches (DE BARCELLOS et al., 2011).

Accordingly, the combined management of animal-crop and forest-pasture system is spreading all over the country. This helps farmers to reach better economic performance, stability, and favorable environmental outputs (CERRI et al., 2010). The processing industry is rapidly updating and developing at the same time (FERRAZ and FELÍCIO, 2010). The upgrading of the processing industry mostly occurs in the form of structural changes, undertaken to attend internal and external market needs (THOMÉ et al., 2012). Meanwhile production and processing becomes increasingly adapted to modern food production requirements; the banned use of hormones and beta-antagonist, favorable prices of cattle meat and favorable currency exchange rates make Brazilian beef more and more attractive on a global scale. As a promising solution for the still existent problems of inefficiency through the chain, the recent agreement on a national traceability system called SISBOV (MINISTÉRIO DA AGRICULTURA PECUÁRIA



E ABASTECIMENTO, 2013) may reduce information asymmetry and business scarcity (MILLEN et al., 2011) by giving the possibility to further improve chain sustainability and customer responsiveness (CARDOZO and PADULA, 2002).

Brazil is the biggest exporter of beef products (with more than 1.4 million tons traded internationally in the year of 2016 and the gains of over 5.515 million US\$ dollars from it), however, processed products present only 9 % of it. The majority of export happens in the form of fresh meat (79% of export), with Russia as the most relevant trade partner, who imports over 25% of the total Brazilian beef export (ABIEC, 2016). Nevertheless, with the decrease of Russia importance (due to economic challenges inside the country) as an importer China and Hong Kong become the new focus of the Brazilian beef export sector.

According to the dataset of the BRAZILIAN DEPARTMENT OF PLANNING AND DEVELOPMENT OF FOREIGN TRADE (2014), Brazilian enterprises are increasingly focusing on the Asian market. The Brazilian food giants - JBS, Brasil Foods S.A., Marfrig - are already dominating the exportation charts destined to Hong Kong, Vietnam and Mainland China, underlining the importance of Asia for the Brazilian food production sector.

#### 4.9.THE CHINESE BEEF SECTOR

China experiences dietary changes (KEARNEY, 2010; RASK and RASK, 2011; ZHAI et al., 2009) due to the abolition of the food ratio rules, the privatization of food marketing system (FULLER and DONG, 2007) and the wider food availability. Combined with the increasing urbanization and tendencies of “westernization” in lifestyle, the country becomes the fastest growing meat consumer in the world (KEARNEY, 2010), reaching an estimated beef consumption of 4,43 kg/year/capita by 2013. Based on the assumption of the consequences of the economic boom (KOMAREK et al., 2012) and food safety associated with beef in China (USDA, 2014), consumption tendencies will continue to increase.

Although China has one of the biggest beef herds in the world, and slaughtered over 47 million heads (USDA, 2014) in 2014, it cannot saturate the growing domestic demand. The reason for this lies in the structure of the Chinese agriculture sector. The Chinese farm sector consists of 200 million farm households with, on average, 1-2 acres of land (CONFORTE et al., 2012). Most of the producers are small family farmers, who are in many cases forced to take off-

farm jobs to ensure a decent income. The percentage of middle and big scale farms began to grow recently, due to the Chinese agrarian reform. However, miscalculation in the sector following the Tenth-Five-Year-Plan led to inefficient reforms in the beef industry, forcing many modern feedlots to shut down and meat processors to run under capacity (WALDRON et al., 2010). As a result, demand of imported beef increased as stated by the CHINESE MINISTRY OF AGRICULTURE (2014).

Taken the given information into account, Chinas challenge of beef self-sufficiency can become a major market chance for the Brazilian beef sector, increasing the necessity of inside full external market information and estimation.

For more detailed analysis of the Chinese beef sector, please see chapter III.

## **CHAPTER II. – METHODOLOGY**

The methodological approach to this research was complex, and began with the right measures to find the proper research questions. It continued with the construction of research tools, which enabled the researchers to reach their final conclusions regarding the particularities of the Sino-Brazilian beef supply chain.

Due to such approximation of the investigation, we adapted an exploratory research approach. According to STRAUSS and CORBIN (2008) the concept of an exploratory research approached is to justify the case and investigate for a deep and ample information on a specific topic. It is also recommended for research processes, which do not have a rigid and identified structure for data collection and analysis, but overwhelmingly work with qualitative techniques. Thus, such approach enables researchers to issue suggests.

## **1. CONSTRUCTION OF RESEARCH LOGIC**

The methodology construction of this research begun with the search for relevant research questions regarding the Sino-Brazilian beef supply chain. Thus, following BERG's (2001) suggestion, we analyzed secondary data sets (scientific, non-scientific literature and databases) in order to get a better understanding of the issue and formulate research questions which are relevant for science and the industry (See figure 1).

By designing the primary research, missing, un-centralized, non-uniformed, and non-up-to date information on the Chinese market were the first major challenge. Hence, we transformed these findings into a research issue. As result, the first research question was answered by the collection and organization of secondary data from every segment in the Chinese beef sector.

After answering the first research issue, the challenge to get an overview on the recent beef supply chain, which exports from Brazil to China, was present. Thus, this issue was transformed into the second research questions of the thesis. The aim was to answer this matter in a way that an actualized overview on the Sino-Brazilian beef supply chain, and the shortcomings, which rise from its structure, can be detected.

The third research question of the work emerges from the need to get a deeper inside the main shortcomings, which were detected from the response of the second research question. Thus, the matter was analyzed by how far is the information availability indeed a matter for the

Brazilian beef sector, by focusing mainly on the countries of the beef packers, who are in direct contact with the Chinese market.

After getting a deeper inside into the supply chain structure and the issues which emerge from it, a systematic exploratory approach emerged to understand which chain external factors have an effect on the Sino-Brazilian beef trade, and what might be their impact on it.

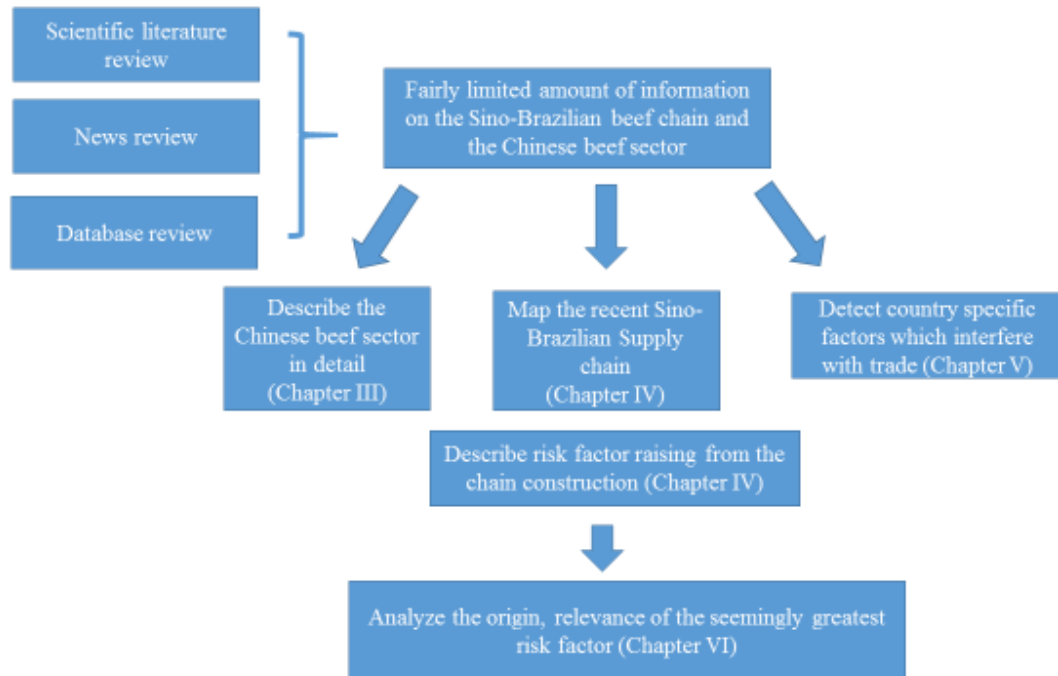


Figure 1: Detection of research problems

Source: Authors elaboration

Thus, in order to find the answers to those questions, a mixed methodological approach was adapted in a proper manner and in accordance with the current state of research problem.

## 2. TOOLS SET USED DURING RESEARCH

Due to the exploratory nature of the research, and the aim to answer the research questions, tools such as literature review, questionnaire and interviews were used. Such tool set gave the possibility to compensate missing information from data sets, and additionally served as validation tool through data triangulation (MILES et al., 2013).

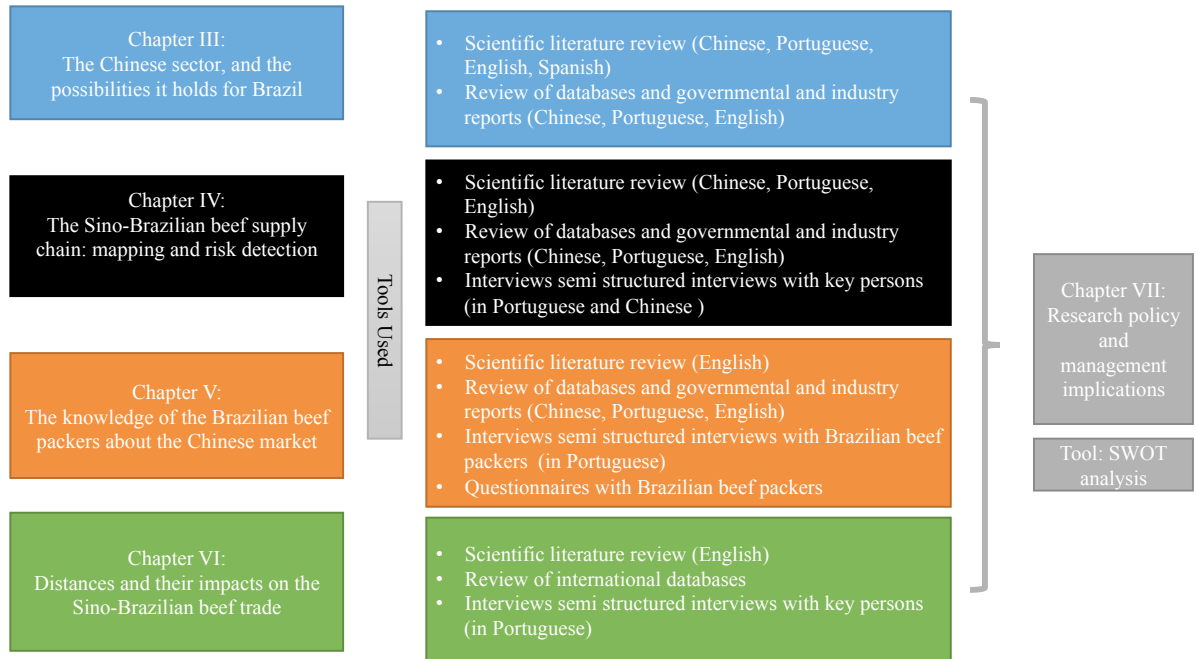


Figure 2: Methodological tools used in the different chapters of the thesis

Source: Authors elaboration

## 2.1.SYSTEMATIC LITERATURE REVIEW

In order to get a deep understanding of the research issue, a literature review was conducted based on Chinese and Brazilian supply particularities. Due to the scarcity of information regarding this issue, not only scientific, but also literature like reports, news and governmental documents, were taken into consideration, which were written in Chinese (Mandarin), English, Portuguese and Spanish language.

Sample of published journal articles were selected to identify relevant literature in Chinese customer expectation and Brazilian export beef features. The sample articles were identified by using an adapted version of approach and steps (NEWBERT, 2007). See below the steps describing the selection criteria:

- a) Search for published journal articles selected by publication date criteria.
- b) The research engines Web of Science, Google Scholar, Scopus and Chinese search engines such as Baidu, and the Nanjing Agricultural Universities own search engines

were used to conduct targeted searches of scholarly articles in English, Chinese, Portuguese and Spanish.

- c) News articles were selected based on the journals reputation and general trustworthiness.
- d) Governmental and industry reports were chosen based on the recommendations of Chinese industry professionals.
- e) Substantive and empirical relevance was ensured by reading and translating all Chinese articles, and the evaluation of the abstracts of English written articles for substantive context.
- f) Furthermore, substantive and empirical relevance by reading all remaining articles was ensured.
- g) Then the consolidation of results from electronic sources happened by including only articles, documents and databases that were relevant for the research questions.

Finally, we use qualitative descriptive ways to weight research results in order to make an open approach and respond research questions

## 2.2.INTERVIEWS

As shown in Figure 2 interviews were used in three different stages of the research (see chapter IV, V and VI). In chapter IV interviewing was used as a research asset to help to get a focus on the main construction elements and their risk factors at the Sino-Brazilian beef supply chain. In chapter V. interviews were used as an instrument to broaden the data collection on the Brazilian slaughterhouses, and get more specific inside into the research issue. In Chapter VI we used the tool of interviews in order to get a deeper inside to the country based relations, and with it, get first hand experiences and examples from Brazilian high ranking diplomatic figures.

Interviews in all cases were semi-structured in nature. Such interviewing technique was chosen in order to give the participants the freedom to address matters important for them, and at the same time the interviewer can lead the conversation according to the research goal (HOLSTEIN and GUBRIUM, 1995).

Interview population in the chapter IV was defined based on desk research and networking, which then led to a snowball sampling in the Brazilian part of the Sino-Brazilian beef supply

chain. If a specific stakeholder was recommended for questioning regarding the research matter more than one time by different contacts, we considered the person a key stakeholder in the Sino-Brazilian beef supply chain. We contacted this professional and asked for a face-to face interview. Regarding the Chinese part of the supply chain, the same population definition method could not be applied, due to the local and cultural circumstances. Thus, we opted to visit strategically important events of business connections between Chinese and International beef traders, where we localized companies which have contact to Brazil due to beef shipments. Thus, we selected Chinese stakeholders based on their company's representation during China's Food and Hospitality Trade Show (11-13 November 2015, Shanghai), and World of Food-powered by Anuga (18-20 November 2015, Beijing). The interviews with Brazilian stakeholders were conducted in Portuguese, recorded and transcribed in English language to facilitate data analysis. Interviews with Chinese stakeholders were conducted in Chinese and English, based on the comfort of the interviewee. Chinese research population however, asked not to record the interviews, thus, notes were taken during the conversations. By analyzing the data with an interpretative positivist approach (SILVERMAN, 2006) coding of specific themes emerging from the interviews were selected in a manual manner. To ensure the objectivity of the analysis, two researchers independently defined the categories. Results were displayed in form of a matrix, organized in rows and columns in a logical order. Although the population interviewed was small the results are valuable due to the key position of the interviewees in the Sino-Brazilian beef supply chain and their chain governing influence.

The interview population for Chapter V was chosen based on their representation at the Salon International de l'alimentation, or SIAL, in Shanghai 2016 (May 5<sup>th</sup> -7<sup>th</sup>, 2016). The SIAL Shanghai is the greatest annual food trade show and networking event of Asia. Thus, if an enterprise has serious interest in trading or networking with the Chinese parties, it would come as an exhibitor or visitor to this event. Accordingly, 14 of its associate enterprises represented ABIEC, which became our research medium. During the three days event the researchers contacted all of the companies associated with ABIEC. First, the companies were asked, if they answered (or not) the questionnaire (see in the following sub-heading (2.3.)) forwarded to them by ABIEC. In the case the firm representatives answered negatively, the official interview was conducted. 6 interviews were conducted all together. Due to the event's business nature, we had only a limited time to speak to the companies represents (5 minutes per company on average).



Due to the business sensibility of the interview environment, only notes were taken, which were later transcribed into English. With a positivist approach a repeated content analysis was conducted, in a similar manner to chapter IV. However, the final display of data did not occur in matrix form, but through direct citation of the interviews. Data were analyzed and backed up or confronted with relevant theoretical literature from the same or similar study fields. Such analysis in the end allowed a qualitative wide range discussion on the topic, and the development of suggestions regarding improvement of weaknesses in the supply chain information flow.

To be able to get a better understanding of country-to-country trade in chapter VI (BERG, 2001), we conducted two interviews. The first interview was conducted with the Brazilian agriculture attaché to China on the 22.03.2016 at the Brazilian Embassy in Beijing, and the second interview was piloted with the director of Apex-Brasil China on the 13.04.2016 at Office Apex-Brasil, Beijing. The research population in this part of the research was kept limited to two interviewees, due to the highest level of importance and influence of the professionals in the given segment of the supply chain. The interviews were done in Portuguese language, to comfort the interviewees. They were recorded, transcribed and translated to English, in order to facilitate data processing. Data were analyzed with a data triangulation process by confronting the primary data with secondary data collected from international databases, and existing scientific literature on similar topics (JICK, 1979).

### 2.3. QUESTIONNAIRES

Specific information used during the questionnaires was based on literature suggestion, and the recommendation of five industry professionals with a minimum experience of 5 years on the Chinese market.

We defined the population of our research based on their involvement in beef exportation to Hong Kong, and their willingness to become accredited for exportation to mainland China. By hoping for a greater response rate, we asked Brazilian Beef Processors and Exporters Association (ABIEC), for its cooperation in distributing the research tool. ABIEC was considered as an important intermediate of the research due to its position, as the greatest industry association of beef slaughterhouses interested in exports. ABIEC has furthermore some political influence due to its representatives in the city of Brazil, at the Brazilian governing center. ABIEC consists

of 26 associate companies, representing around 96 slaughterhouses or 39% of the total amount of Brazilian beef slaughterhouses with a Brazilian Federal Inspection registration (SIF- Serviço de Inspeção Federal) (BRAZILIAN MINISTRY OF AGRICULTURE LIVESTOCK AND SUPPLY, 2016). Additionally, from the 96 slaughterhouses associated with ABIEC, 15 are accredited to export to mainland China (and only one Brazilian slaughterhouse accredited to export to mainland China is not a member of the ABIEC) and at least 23 slaughter plants are under the process of accreditation to the mainland. Thus, it becomes the most appropriate and widest rang available information source for the research.

Responses from the questionnaires were received between April 3<sup>rd</sup>, 2016 and May 11<sup>th</sup>, 2016.

Before applying the questionnaire, the instrument was analyzed by four specialists from the academic and market area. Their suggestions were incorporated into the questionnaire. After having the questionnaires questions over-viewed based on their clarity and objectivity, we constructed the online platform hosting the research instrument. We used the platform of Survey Monkey (<https://pt.surveymonkey.com/>), due to its compatibility with any email server and provider, its easy-to-handle construction options, and its user friendly interface. The questionnaire was designed to last maximum 10 Minutes and included, multiple choice, simple choice, and closed questions (See in Annex) .

The questionnaire was divided into three main parts, *Part A*, *Part B* and *Part C*. *Part A* of the research tool collects information related to firm size and export profile, which according to the scientific literature might have a positive effect on information availability. *Part B* of the questionnaire is focused on Brazilian companies information sourcing and their trustworthiness. *Part C* of the questionnaire contains a knowledge test. Questions used in this section of the tool are result of literature review, and five professionals experience regarding the most essential information on the Chinese beef market and its dynamics. In the end, the information sourced from this tool were co-related with each other, with the goal to find connections between firms size, firms experience in export, its information sourcing attributes and the actual knowledge they have.

Due to the small amount of responses, and the impossibility to reach the census of the responded population, we were not able to do any statistical analysis, exempt the definition the median. However, we analyzed the obtained data in a qualitative way, allowing interpretations of

the data and matrix displays. Matrix display is used in the form of intersections by listing rows and columns.

In order to validate the research tool, we used face to face interviews (see previous subsection) and implemented both data results in form of data triangulation (DENZIN AND LINCOLN, 2011).

Thus, as a result, the quantitative tool, which was applied, did not work as a proper resource method on its own, due to the low population and relatively low response rate from it. However, by combining it with interviews from the population, which missed to respond the questionnaires, it became a valuable research tool.

## 2.4.DATA TRIANGULATION

Data triangulation was chosen to combine the information of the different “sub-researches” in this dissertation into one comprehensive conclusion. Triangulation of data was seen as the proper method, due to its ability to connect different types of data sets, theories, methods, observations and interpretations into one logical built up finish (JICK, 1979). In order to unify all the results into one comprehensive matrix a SWOT analysis was chosen as a display. Through such we organized the research results into strengths, weaknesses, opportunities, threats for the stakeholder of the Sino-Brazilian beef supply chain.

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### **CHAPTER III. - THE CHINESE BEEF SECTOR AND THE POSSIBILITIES IT HOLDS FOR BRAZIL<sup>1</sup>**

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<sup>1</sup> Presented at the conference called XI. JORNADA NESPRO - A pecuária de corte como solução à crise, 26 -27 of September 2016 in Porto Alegre, Brazil.

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## **1. ABSTRACT**

Due to the increasing trade volume of Brazilian beef to mainland China and the lack of general information on this immature beef supply chain, a framework was built up in order to understand the past, recent and future tendencies of the cattle meat flow between the two countries. In doing so, first, the Chinese industry from the producer to the consumer was characterized. Flowingly, factors triggering Chinas beef import and with it the possibilities it holds for Brazil were highlighted. Due to the scarce, not sufficiently update and limited English written literature of the Chinese beef sector and the opportunities it holds, this research has based its implications and results on an holistic review of the sector. Additionally, it fills in gaps in the literature. Therefore it becomes a rich information source for the public and private sector engaged in meat related trade activities.

## **2. INTRODUCTION**

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 continent to Asia's biggest economy (Brazilian Ministry of Development, Industry and Foreign Trade (MDIC)), and beef is one of the main elements of it.

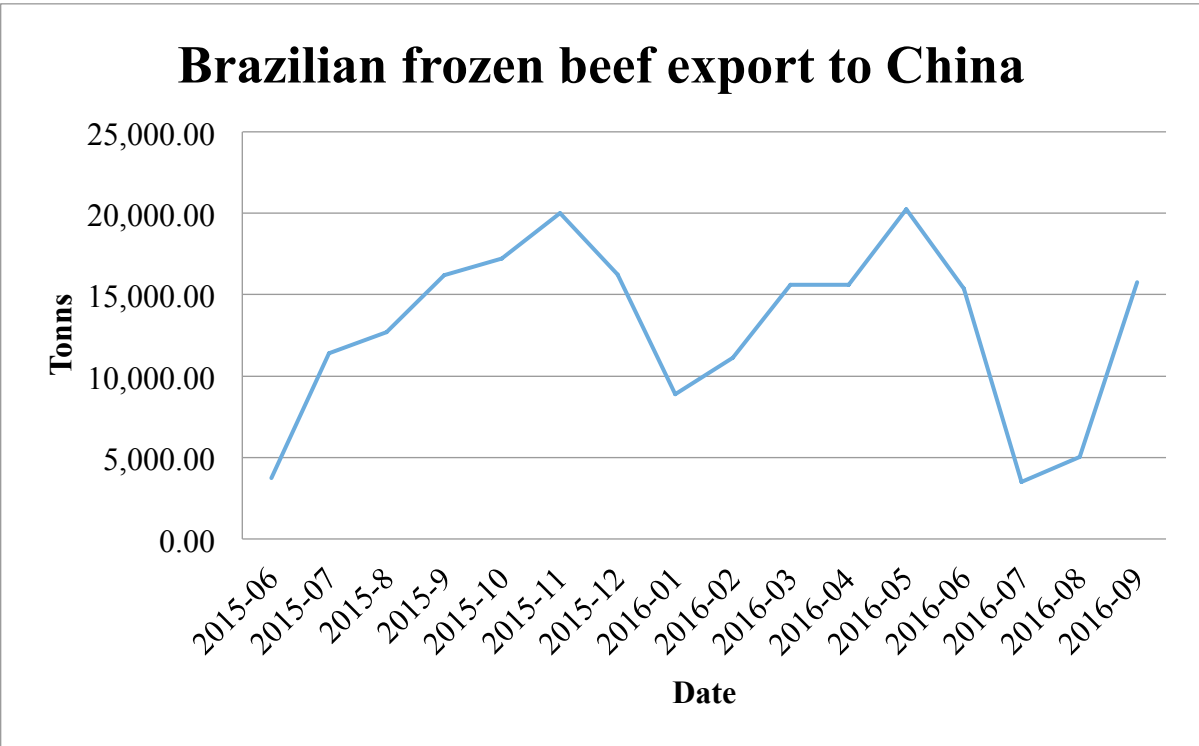


Figure 3: Brazilian frozen beef export to mainland China (commodity code HS0202)

Source: Authors elaboration based on UNcomtrade 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 extense that Brazil became rapidly mainland Chinas 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, trade via Hong Kong etc.

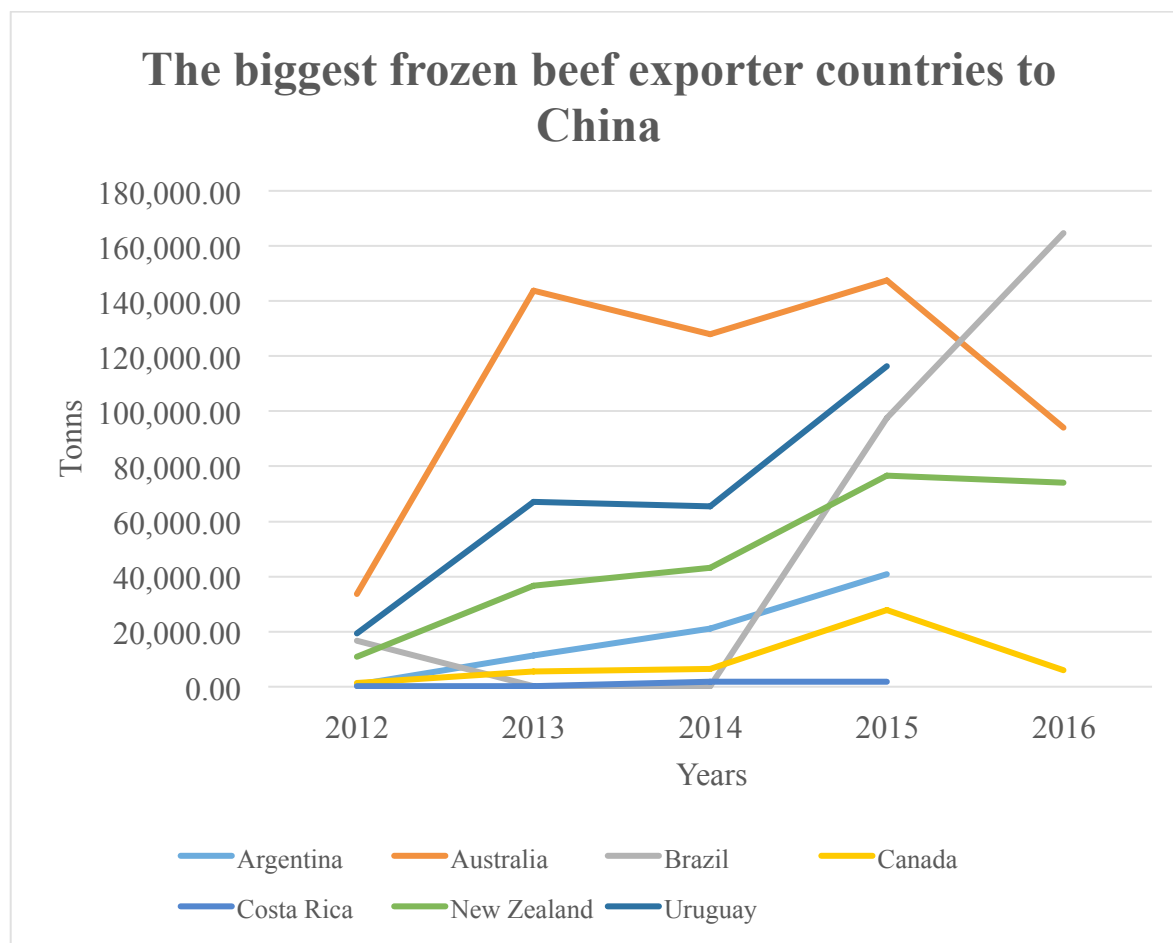


Figure 4: The most relevant beef exporting beef trade tendencies with mainland China (commodity code HS0202)

Source: Authors elaboration based on UNcomtrade data

Although the Brazilian beef export to Asia is substantial enough to impact the world beef price, the Latin American cattle meat industries knowledge on its most relevant foreign consumer is limited (Knoll et al., 2017). 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).

### 3. CONCEPTUAL FRAMEWORK

To have a possibility and advantage on a geographically distinct marketplaces global orientation, the understanding of the foreign market are absolute necessities to guarantee the economic survival and sustainable firm improvement (Yeniyurt et al., 2005). 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 and Tesar, 1977; Cavusgil, 1980, 1984; Czinkota, 1982; Eriksson, et al., 1997; Johansson and Vahlne, 1977; 1990).

Entering into a new and external market comes hand in hand with several liabilities for the management (Zaheer, 1995). One of such is the complication to interpret and understand the external markets local administration, government and partners/human resource particularities. Additionally, complications 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 etc. (Johanson and 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 and Beamish, 1997; Makino and 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 in 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 and government regulations

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

#### **4. METHODOLOGY**

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:

- a) History of the Chinese beef sector
- b) Industry tendencies
- c) Policies affecting the sector
- d) Cost and prices of production and processing of beef in China
- e) Regional particularities of the beef sector
- f) Main logistical characteristics of the industry
- g) Tendencies of consumers' beef prices
- h) Consumption trends
- i) Import and unofficial trade
- j) Brazil's possibility based on the countries beef production profile

## **5. RESULTS AND DISCUSSION**

In the following section, the Chinese beef sectors particularities and its implications for the industry of Brazilian beef export are discussed in detail.

### **5.1.SHORT HISTORY OF THE CHINESE BEEF CATTLE INDUSTRY DEVELOPMENT**

Before 1980, large collectives governed and managed the Chinas cattle herd. At this 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 (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 and 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 industry. Due to the increasing beef production related to the subsidy program, overproduction and price stagnation became a new industry 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 labor 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 and 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).

### Changes in Chinese beef cattle number and production in the light of impacting events

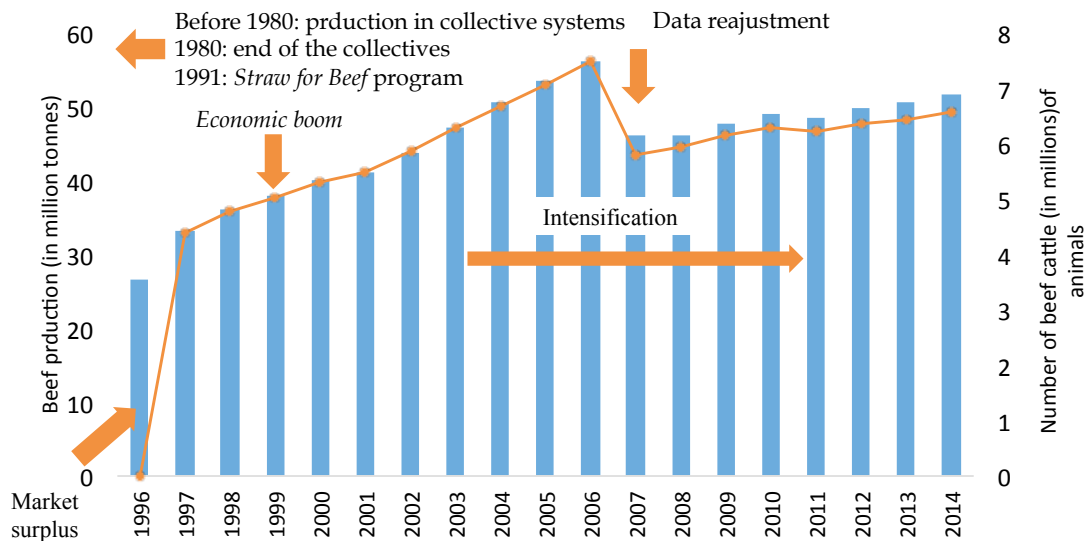


Figure 5: Production trends and its impacts the Chinese beef industry, 1996-2014

Source: Authors elaboration based on Waldron et al. (2015) and the Chinese’s livestock yearbook 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.

#### 5.2.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 specifications 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.

#### 5.2.1. Policies, incentives and their impact on the industry

Policy changes and support mechanisms in the recent 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 actual 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 30 000 cows. The support targetes 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 technological 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) (See further information under subheading 5.2.3.). 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).

### 5.2.2. 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 of 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 South Americas beef biggest producer (See Table 1).

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

<b>Type of cut</b>	<b>Price</b>
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 (data of 16.08.2016) 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 occurred 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 (see subheading 5.5) and an increasing quantity of import might further compromise the general governmental goal of self-sufficiency.

### 5.2.3. 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/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 desired goal of the central government (with a budget for investment of 1 billion 300 million yuan)(taoniu.com, 2013).



Figure 6: Beef cattle distribution in the different provinces in China (one dote equals 200 000 cattle)

Source: Waldron et al., (2015)

As shown in Figure 3, 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, Xianan breeds. The biggest consumer markets for this meat are located close to Beijing, Tianjin, and the Yangtze River Delta. Slaughter and processing enterprises in these regions have a high degree of modernization. However, they are 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 governmental goal in these regions investment is to be able to



supply the surrounding region's beef quantity and quality demands 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 exiting pastoral areas, the central governmental incentivizes include further crop straw resources used combined with the expansion of artificial grassland. Thus, the original extensive grazing profile of these areas is existent 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 promoted, due to environmental restrictions.

### 5.3.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 (see subheading 5.1.).

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 were 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 (see subheading 5.6.2.) 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).

From these organizational problems, supermarkets benefit. In such, they 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 (Wang 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.

#### 5.4.CHINESE BEEF PRICE

Beef price increased steadily since 2007, due to several reasons. Additionally to the problems in the production sector (see subheadings 5.1, 5.2, 5.3 and 5.4) and the diversification of diet, improved living standards comes hand in hand with consumers' willingness and the ability to pay higher prices. Although price increase is relatively steady over years, wintertime represents a special peak (see Figure 4) 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. Thus, noted 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.

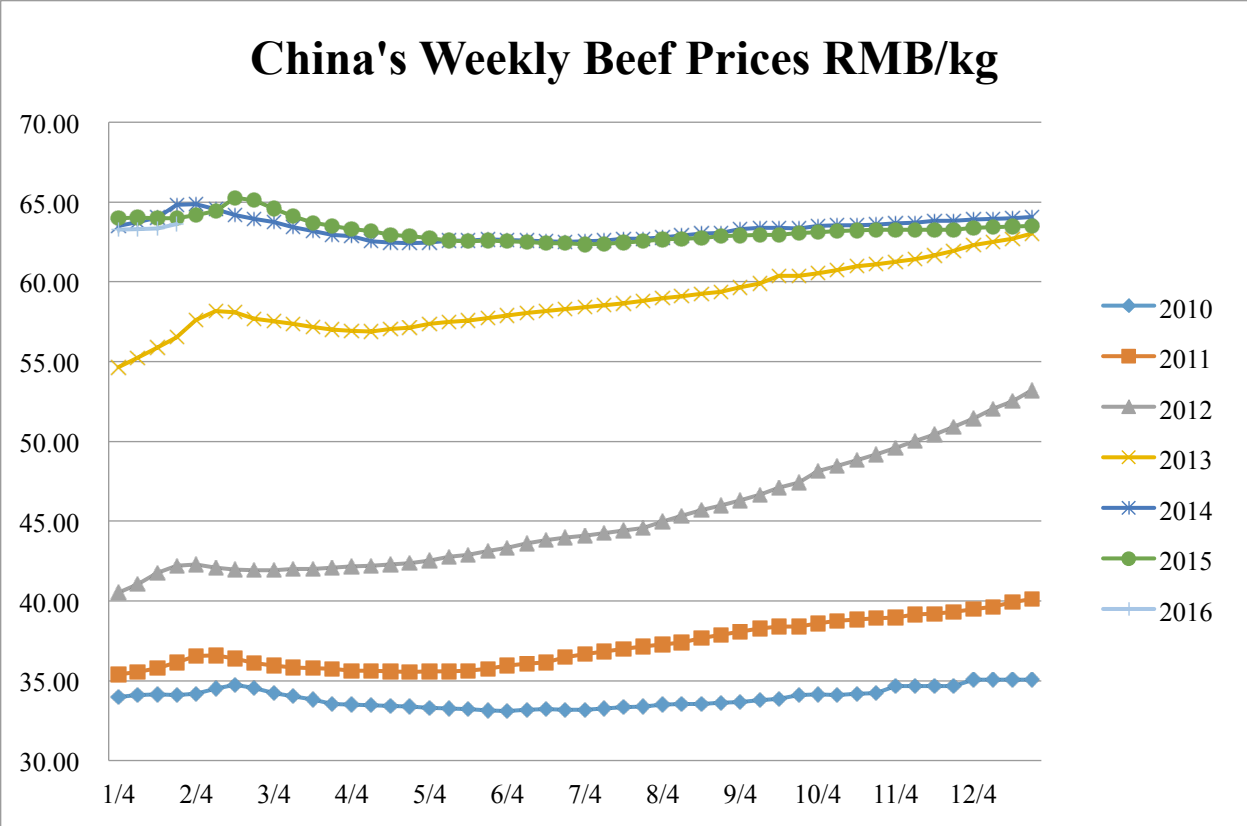


Figure 7: Changes of beef price throughout the different years and months

Source: Authors elaboration based on Chinese Agricultural Ministry’s data set.

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 drops. This might be shown in the statistics figures as a slowdown of the increasing beef consumption and will feasibly result in stable prices in the next years as discussed by RadoBank Group analysts (Sherrard et al., 2016).

5.5.CONSUMPTION TRENDS

Although the annual growth rate of the Chinese economy slows down, it still represents 6, 9% in GDP increase during 2015 (The World Bank, 2015). Such increase and its impact on consumption tendencies (of nearly 1.3 billion people) have an impact on the global economy and

the international food trade. In the specific case of the Chinese beef consumption, an annual growth of 1.28% is measured between 2010 and 2015. According to the national population estimate, between 2010 till 2015 they expect 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 corresponding to an increase of 0.3 kg/annually since 2015.

Although, approximating the most realistic Chinese beef consumption data is complicated - due to irregularities of the province based data collection (Waldron et al., 2015), and excessive differences between Chinese National Statistics and international organizations estimates - researcher 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 applied shows 4,6 kg/person/capita of beef consume in 2010 in the urban areas. Even higher numbers are estimated by Bai et al., (2012) saying 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 might it can be assume that around 5 kg person /year beef consumption might be a close guess to reality (Figure 5).

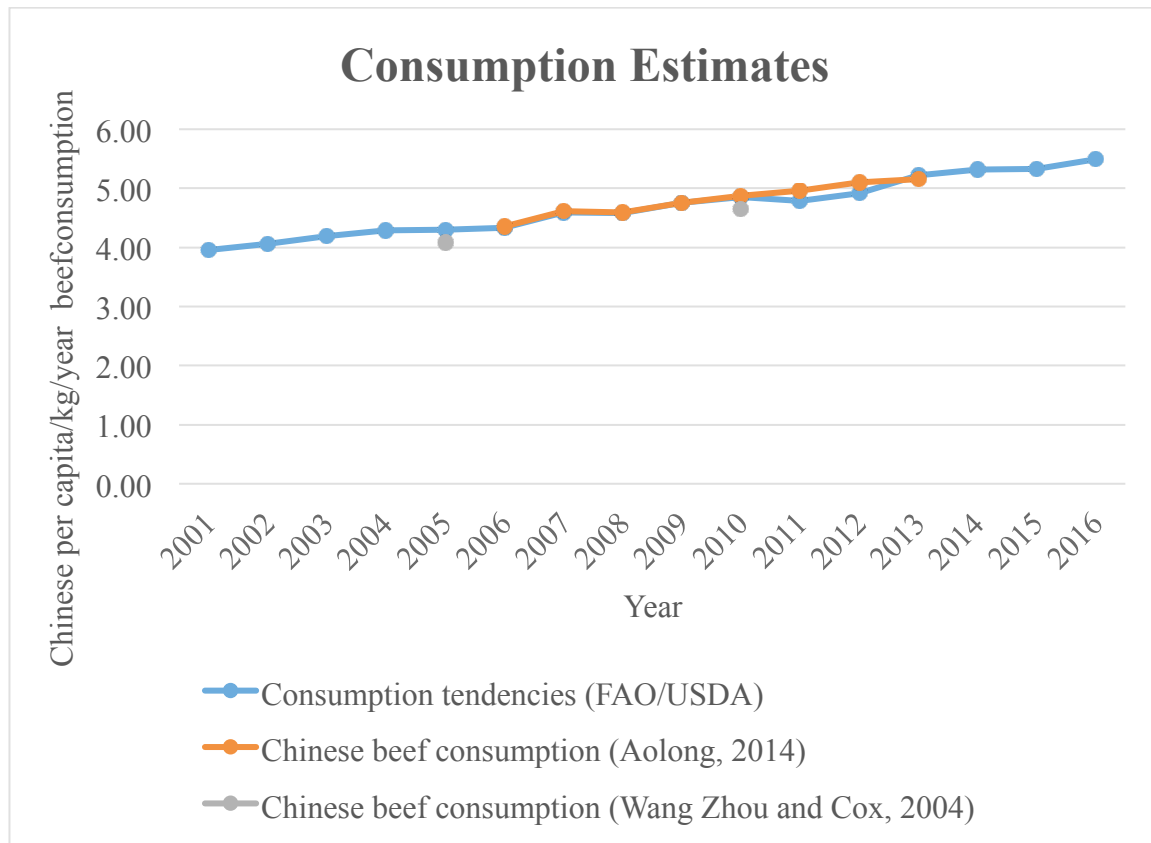


Figure 8: Consumption estimates from three different sources throughout time

Source: Authors design based on FAO population estimate, USDA consumption estimate, Aolong (2014) report, Wang Zhou and Cox (2004) own independent research

At this moment China has three main different cattle meat related value chains, namely the low, middle and high value beef chain (Waldron et al., 2010)

In the low value chain, the fragmented existence of 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 slaughter under unhygienic conditions and sold in wet-markets without existence of security, quality and standardization. Nevertheless, this is the most dominant value chain (80- 85% of the consumption) (Waldron et al., 2010). The products of this value chain are dominantly purchased and consumed by low incomes household members in low control restaurant environments.

Nevertheless, Chinese middle class experiences rapid expansion (Conforte et al., 2012), and with it elevates its desire for a safer product. Such social classes are willing to pay small premiums for improved food safety (Waldron, 2008). The products in this value chain are based on dominantly grass fed cattle, produced by small farmers, sold on wet markets and in supermarket chains. The measured values of the 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 presentation and variant to the consumer. Although a national beef grading systems exists, they do 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 lie not in the quality of beef, but rather in the safety and tractability of the product due to voluntary labeling system and 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 owed 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, 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.

In Figure 6 we display the traditional cuts of China.

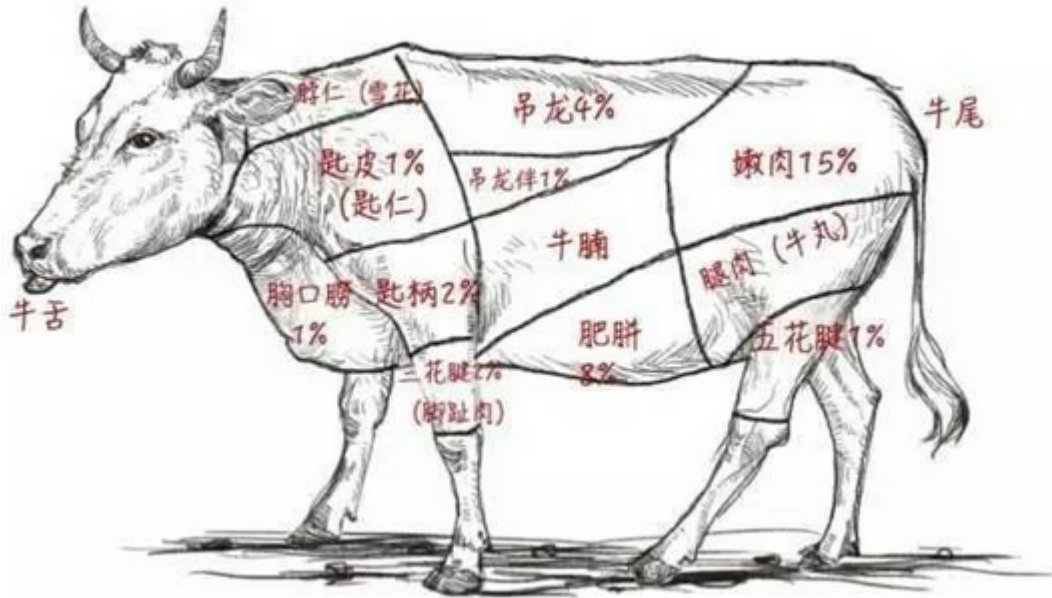


Figure 9: Traditional Chinese beef cuts

Source: 巴西那些事儿 publication 2016-07-05

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 and Gale, 2014). Most used cuts are beef shoulder steak, flank, bottom round (based on a conversation 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. 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 standards 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 and 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 year. 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, the industry branch is still new and 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; or throughout the cold chain handling and its capabilities, especially at the logistical switch points such as wholesales market to road transportation, can experience 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 preoccupations 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).



## 5.6.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 explain the mayor particularities of such.

### 5.6.1. 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 and Gale, 2014).

China's beef production and import volumes show increases on year by year basis (see Figure 7). 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).

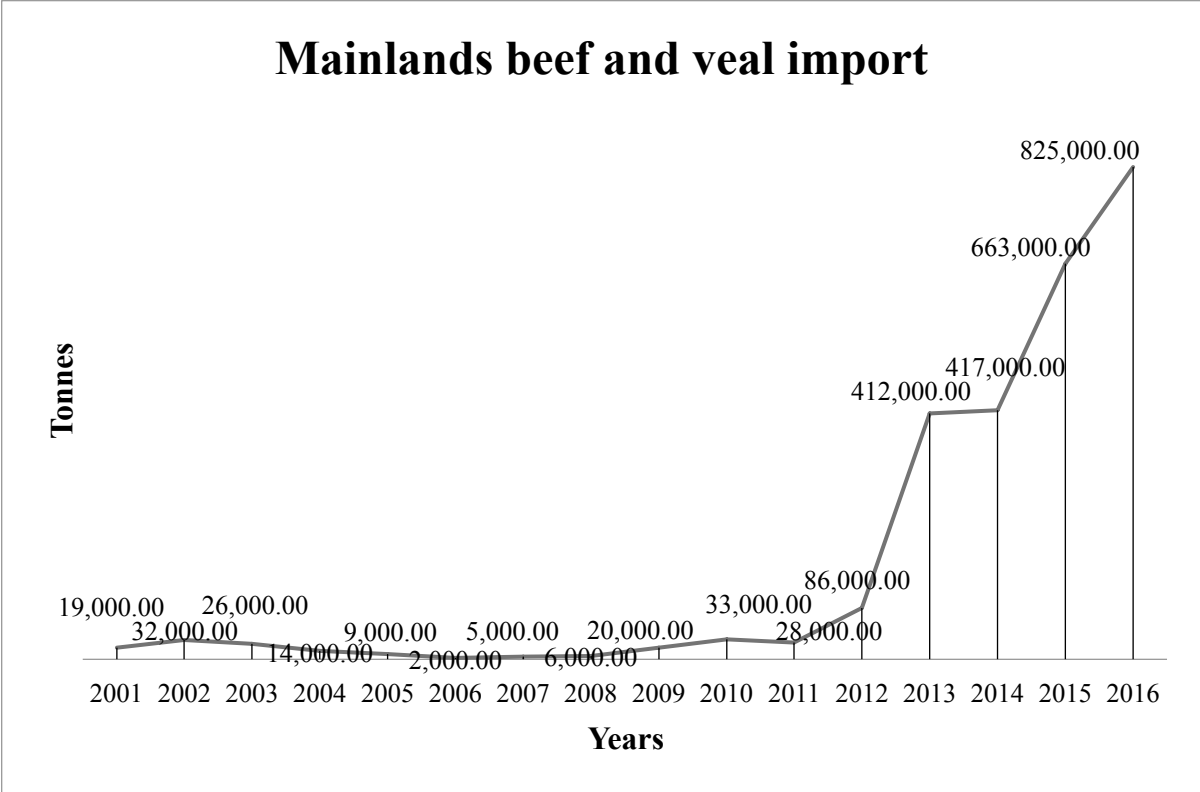


Figure 10: Chinese beef import tendencies since the countries entrance to the WTO

Source: Authors designs based on USDA estimates

That shows a growth of over 35% from the previous year. In 2015 Chinas main suppliers are 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 of breed adaptation for feedlots systems, breeding animal and reproduction material need of China has increased and made the United States, Canada, France, Sweden, Germany, Romania, Holland, New Zealand, Australia the most relevant genetics' exporters to China. Australia, New Zealand and Uruguay are becoming the main live animal exporters to mainland China.

Regarding beef, according to Edwards (2016), brisket, shin/shank, silverside/outside have been the most popular cuts by total volume but strip loins and cuts such as ribs, rump, tenderloin,

thin flank, chuck etc. have increased substantially in the recent years. According to Edwards'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 possibly emerging trends of further diversifying meat consumption. He 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 experiences 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 supported with the knowledge in slaughterhouse capacity underutilization due to Chinese native cattle supply and their willingness to live up to their capacity and prepare further processed beef products 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).

#### 5.6.2. 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 8, the foreign beef mostly enters via the port of Hong Kong and Vietnam (Taipei) and can originate from several already accredited, and non-accredited countries for mainland China.



Figure 11: Mainland China's most important illegal trade entrances and areas

Source: Authors elaboration based on China Animal Husbandry Association (2015) description.

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 by 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 with Indian meat, additional rumors exist that buffalo and cattle are walked to Bangladesh and are processed there for after 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 of 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).

## 5.7.THE SPECIAL CASE BRAZIL – CHINA

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, and increasing appreciation of food safety, together with the economic growth of the country, comes 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 excessive 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.

Through getting to know the Chinese trading environment the favors of the "*guanxi*" business culture can become a liability, however, a positive asset too, if its well understood and

practiced. To reach such a higher involvement on a political and private level with China is needed from the Brazilian parties.

Due to the BRICS political membership benefits, both countries have a lot of options to strengthen their relation. With it beef flow intensification could become a central point of it, as it is shown in the manuscripts below (Chapter V, VI).

## **6. CONCLUDING REMARKS**

The impacting fragmentation of the Chinese food 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.

Nevertheless, 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 trust in specific brands, which some Chinese companies, but also more and more international beef traders from countries such as Australia and Uruguay are using for their benefits.

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 costs, local production cost, low trust in the domestic food safety, great fragmentation and low synchronization all over the sector, and the insufficient domestic production gives beef exporting countries such as Brazil a very good opportunity to merchandise their product.

Additionally, the Brazilian production style, its cost and the growing importance of new strategic alliances between BRIC countries add all possibilities for a sustainable beef trade

environment. However, the Chinese market and its political and cultural influences must be studied and understood better, in order to optimize market access and positioning.

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## CHAPTER IV. - THE SINO-BRAZILIAN BEEF SUPPLY CHAIN: MAPPING AND RISK DETECTION<sup>2</sup>

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## 1. ABSTRACT

**Purpose** – The flow of the Sino-Brazilian frozen beef trade has intensified. Thus, the purpose of this paper is to characterize the supply chain structure, and identify its major fragilities. **Design/methodology/approach** – Supply chain mapping was conducted based on the existing literature and primary data collection. Key stakeholders were detected and questioned through semi-structured interviews, which were later interpreted with content analysis.

**Findings** – The results reveal a low degree of chain coordination from the Brazilian farm to the Chinese consumer, arising from an immature traceability mechanism, a limited flow of reliable information between the segments, and low trust between the stakeholders.

**Research limitations/implications** – The infancy of the beef trade, the paucity of literature on the topic, and restricted accessibility to key governmental and official materials imposes limits on the available information. Language and cultural barriers might have also impacted the interviewees' responses. However, the participation of Brazilian and Chinese academics in both the interview analysis and chain mapping mitigates these shortcomings.

**Practical implications** – The Brazilian public and private sectors need to establish a reliable traceability system and information platform. This, together with investments in marketing and branding, would facilitate differential responses among traders and consumers, and, hence, improve supply chain sustainability.

**Originality/value** – By adopting an inter-country approach and directly sourcing views from specific key figures in the supply chain this study offers some unique insights and contributes to the literature on the emergence of a multi-polar global food trade.

**KEYWORDS** Meat, Beef, Risk factors, Sino-Brazilian trade, Supply chain weakness

Paper type Research paper

## 2. INTRODUCTION

As the international food trade becomes multi-polarized, there is a need to explore the changing organizational structure of the supply chain, its processes and risks. For years now, China has been one of Brazil's main trading partners, with agricultural products dominating the export portfolio: the main items include soy and its sub-products, corn, chicken, and, more recently, beef (Wilkinson et al., 2015). Therefore, this study examines the tendencies that diverge from the commonly investigated trade patterns between developing and developed countries (Aksoy and Francis, 2010), and instead assesses two emerging economies, with enormous economic potential, that play a fundamental role in the world food trade. This development has nurtured new questions for researchers and policy-makers concerning the drivers, enablers, and barriers to this change. Focussing on the specific case of Brazilian beef, this study explores the reality of one of the world's biggest beef exporting countries (1,705,000 metric tons in 2015) (United States Department of Agriculture, 2016) which concomitantly faces international criticism related to product safety, environmental issues, and social responsibility along the whole chain (Greenpeace, 2009).

In response to such concerns, and given the Brazilian export-oriented governmental policies, there is a need to gain a deeper insight into the problems and risks connected to the different segments in Brazil's beef supply chain, especially regarding its biggest external consumer (China). To date, however, there have been no studies on the issue of beef exports from Brazil to China. Consequently, the primary research aim is to characterize the structure of the supply chain while uncovering its major fragilities. While such mapping is an essential hermeneutical tool to appreciate the chain dynamics, for the researcher it is a key means of understanding the way Brazilian beef reaches the Chinese consumer. To complement the

generality of the mapping approach and to delve deeper into the system's main shortcomings, this study aimed to detect specific risk factors for the different chain segments and for the chain as a whole. Thus, this paper comprises two main parts: the first summarizes the particularities of the Sino-Brazilian beef trade; the second focuses on the shortcomings of that supply chain, based on the viewpoints of the chain's stakeholders.

### **3. CONCEPTUAL FRAMEWORK**

A mixed theoretical and conceptual framework is used to systematically explore the emergent and dynamic Sino-Brazilian beef supply chain. Initially, based on Taylor (2005), we map the supply chain to get an overview of its structure. Then, as suggested by Miron and Preda (2009), we identify relevant and experienced stakeholders in the chain segments in order to get a comprehensive overview, not only of the vulnerabilities arising from the chain structure, but also of risks perceived by active and defining stakeholders within the chain. The theoretical background and the logical build-up of this conceptual and operational framework are detailed below.

Although the literature on the risks and vulnerabilities of supply chains is broad, there remains a lack of conceptual frameworks that provide clear guidance on a global level regarding the shortcomings of supply chains (Manuj and Mentzer, 2008; Paulsson, 2004). It is becoming increasingly important to fill that gap, especially for emerging economies, which have become more relevant economic players since the 2008-2009 crisis (Gereffi, 2015). These countries were previously shielded from global markets by market access restrictions, but are becoming increasingly important, especially in food trade. However, globalization brings both benefits and risks (Gereffi and Luo, 2015).

This research examines the special case of the beef trade between the greatest emerging consumer (China) (Brown et al., 2013) and the largest emerging producer (Brazil) (Martha et al., 2012) and aims to map the chain's basic structure, from the Brazilian farmer to the Chinese consumer, and so determine its main particularities, through the lens of risk factors.

This study can be seen as a follow up to Vieira and Traill's (2008) work, which highlighted the importance of the Brazilian beef export market to Brazilian consumers through the upgrade in the slaughter industry triggered by the ability to meet international requirements. It also

broadens the discussions of international supply chains and their risk factors, with China still a relatively un-known, exotic market (Lehtinen et al., 2016). Following the suggestion from Manning and Soon (2016), determining the risk factors and their environment in the Sino-Brazilian beef supply chain can be seen as a first step in the construction of a resilient food supply chain. For Van der Vorst and Beulens (2002), such interplay derives is broadly called business “uncertainty” or the abstract expression of risk that can be used to reconstruct the supply chain. While we assert this acute observation, from the stakeholders’ point of view, risk assessment remains the means by which chain participants relate with the external environment.

Here supply chain theory is explored in the perspective that supply chain management “offers the opportunity to capture the synergy of intra- and inter-company integration and management”, as proposed by Lambert et al. (1998). The collaboration between stakeholders at the level of different segments in the supply chain can contribute to match the supply with demand (Cooper et al., 1997; Simatupang and Sridharan, 2002). Supply chain analysis concerning food has become an important issue, due to its ability to track vulnerabilities and risks in food safety Van der Vorst and Beulens (2002) and supply and demand management, which can affect all chain participants as a result of interdependence (Gereffi et al.,1994). Exploring the Australian agribusiness sector, Jie et al. (2013) studied the linking between supply chain practices to competitive advantage. These authors identified that trust and information quality among the stakeholders of the supply chains are strong drivers of the Australian agribusiness competitiveness. Studying the beef processing industry in Australia, Juan Ding et al. (2014) identified the strong relation between quality of information sharing and supply chain food quality. The authors found that strategic alliance, information quality and trust and commitment are significantly related to beef quality.

After mapping the Sino-Brazilian beef supply chain, a stakeholder’s analysis is used to identify relevant chain players and their perception of the fragilities within the chain. Stakeholders, through their interdependence, create a network and determine the day-to-day interactions that characterize the supply chain dynamics (Freeman and Liedtka, 1997). We questioned them in detail about their perception of risk factors regarding the supply chain. Following Miron and Preda’s (2009) approach, we first identified the relevant stakeholders within the Sino-Brazilian beef export sector and then briefly assessed their characteristics.

During the interviews with the stakeholders, we focussed on issues perceived by them regarding supply, demand, control, process, and environmental problems they have or expect to have in the future. For this purpose, we used Van der Vorst and Beulens (2002) interpretation of supply chain bottlenecks to categorize the pitfalls, Christopher and Peck's (2004) framework to characterize supply chain resilience and Jüttner's (2005) approach to understanding business in supply chain management.

As defined by Miller (1992), risk is a measurable form of incertitude, created by the combination of uncertainty and impact. Its management requires the identification, analysis and assessment, communication, and the control thereof (Holzbaur, 2001). However, Starr et al. (2003) stated that classical risk and risk management are based on enterprise risk management. Therefore, its implementation in complex network systems failed on a widespread basis. Thus, following the recommendation of Peck (2006), when working with supply chain risk management, it is preferable to approach the issue as an open interactive social system, instead of a business process at the enterprise level. Based on Peck's theory, a supply chain is managed by individuals: every member of the chain sees the management of it through their own eyes, and has their own ideas and measures regarding it. Consequently, in practical terms, a patchwork theory and methodology of analysis and control is needed to develop the best possible approach to understand a supply chain, and the possible disturbances, which affect it.

As proposed by Christopher and Peck (2004), there are process risks related to adding value and the managerial undertakings executed by the firm that are directly related to internally owned and managed assets. Control risk factors arise from the misuse of rules established by the system that governs both the firm and the chain. Demand risk factors arise due to uncertainties and disturbances within the flow of products and information between the organization and the chain downstream. Supply risk is similar to demand risk, but related to the firms upstream. Finally, yet importantly, environmental risks are factors that directly impact the chain and firms outside the chain system. Such impacts can be socio-political, economic or technological, or natural events, and impact directly on the market or the up and down stream of the chain (Christopher and Peck, 2004).

## 4. METHODOLOGY AND DISCUSSION

Following the research objective and the steps indicated in the theoretical framework, the first task consists in mapping the Sino-Brazilian supply chain, followed by the identification of key stakeholders and the interpretation of the supply chain fragilities.

### 4.1. CHARACTERIZATION OF THE SINO-BRAZILIN SUPPLY CHAIN

China is experiencing dietary changes (Kearney, 2010; Rask and Rask, 2011; Zhai et al., 2009) due to the abolition of the food rationing rules, privatization of the food market system (Fuller and Dong, 2007), and greater total agricultural output and food availability. Combined with increasing urbanization and some acceptance of Western dietary habits, China has become the fastest growing meat consumer globally (Kearney, 2010). Although China has one of the largest beef herds, it cannot supply its growing domestic market, because of the smallholder dominated structure of the Chinese agriculture sector (Conforte et al., 2013) and the miscalculation in the establishment of slaughter sector innovation following the Tenth Five-Year Plan (Waldron et al., 2010). Indeed, import demand for beef has steadily increased since 2001, and the present growth rate is expected to continue in the coming years (Hansen and Gale, 2014), opening significant possibilities for the Brazilian beef export sector. Exporting 1.6 million tons, Brazil was one of the world's biggest beef exporters in 2015 (United States Department of Agriculture, 2016), resulting from a favourable natural environmental and the country's pro-export policies. Additionally, exporting beef has increasingly enhanced the competitiveness of the Brazilian agricultural sector through its exposure to international competition (Klein et al., 2014), leading to an increasingly professional management approach by farm owners (Oaigen et al., 2013). Furthermore, additional production capacity is anticipated as low production areas are being improved through the combined management of animal- crop and forest-pasture systems (McManus et al., 2016), thereby opening further possibilities for primary material production. Meanwhile, the Brazilian meat processing industry is rapidly updating and developing (Ferraz and de Felício, 2010). The upgrading of the processing industry mostly involves structural changes that attend to internal and external market needs (Thomé et al., 2012). However, research shows that the Brazilian chain remains a work in progress and major challenges continue to exist: for example, animal handling and animal age in the primary sector, logistical



inefficiencies throughout transportation (Soysal et al., 2014), and processing issues in slaughterhouses.

Previously, Brazil's beef exports were mainly focussed on the European market. However, due to the introduction of increasingly rigorous food traceability requirements by the European Union following meat scandals, stakeholders in the Brazilian beef sector have re-assessed their options (Pereira et al., 2011). Increasing demand in the internal market and from other developing and emerging countries has led to a shift in the export profile to less exigent markets, with low aggregated value and high quantity demands. Although Brazil produces some beef with higher aggregated value (through voluntary traceability systems and improved meat quality), the export sector is still overwhelmingly focussed on commodity products, such as is the case with exports to China.

While Brazilian beef exports to mainland China were banned between December 2012 and June 2015 for sanitary reasons (Brazilian Ministry of Agriculture Livestock and Supply, 2015), Brazil continued to focus on the Asian markets during this time using the ports of Hong Kong and those in Vietnam (US Meat Export Federation, 2014). Through these was commonly believed that products reached mainland China over an unofficial trade network.

Currently, Brazil ships its beef products to several ports in mainland China, including Shanghai, Yantian, Xingang, Nansha, Nanjing, Guangzhou, Dalian, Xiamen, Jiangmen, Qingdao, and Ningbo, as reported by the Brazilian Beef Export Association (ABIEC) via personal communication with the researchers (9 September 2015). The recent beef trade between Brazil and China is comprised mainly of frozen beef products, which can be characterized as low value-added commodities. Although freezing the product is necessary for logistical (the shipping time exceeds 34 days) and sanitary reasons (to eliminate pathogens, such as foot-and-mouth disease), it lowers the perceived product value and prevents it from entering the premium quality Chinese beef retail market. The beef cuts exported by Brazil to China are widely known in the international market (such as beef shoulder steak, flank, bottom round, brisket, etc.) and are used mainly for such dishes as hot pot and Chinese barbecue (Brown et al., 2013). The volume of frozen beef exported from Brazil to the Greater Chinese area (including Hong Kong and Vietnam) totalled over 253,000 tons in 2014. That represents 23 per cent of the total Brazilian frozen beef exports and corresponds to 36 per cent of the Greater China Area's total frozen beef imports (UNcomtrade, 2016), with the potential for continuing growth.

Due to the infancy of the supply chain under discussion and the absence of reliable data sources for recent years, this study applied a mixed data collection methodology to generate a realistic overview of the Sino-Brazilian frozen beef trade. Several conversations were conducted with international industry professionals during the World Meat Industry Development Conference (19 May 2015, Qingdao), the China International Meat Industry Exhibition (20-22 September 2015, Qingdao), China's Food and Hospitality Trade Show (11-13 November 2015, Shanghai), the China International Meat Conference 2015 (17 November 2015, Beijing), and World of Food-powered by Anuga (18-20 November 2015, Beijing). Secondary data sources were then used to test and check the information. To formulate a systematic overview of the supply chain and its environment, the study mapped the supply chain, as suggested by Taylor (2005). After which the supply chain was separated into three main parts based on the geographical location of the frozen beef flow.

As supported by the literature (Vieira and Traill, 2008) and also stated by the interviewees, the upstream of the supply chain has two main segments: the breeding/raising facilities (farms) and the slaughterhouses. These two segments contain different agents and product stages. In Brazil, the federal inspection system (SIF), a mandatory traceability system, is in place to trace the animal flow, and consists of the three main elements: the transaction invoice, the animal transportation certificate, and the fire mark of the farm from which the animal originates. The animal traceability is not based on individuals, but on groups of animals (so called lots), consisting of cattle that are handled together, as a unit, throughout their lives. The system has been in place for beef exported to China since the signing of the bilateral agreement between the Brazilian Ministry of Agriculture (MAPA) and the Chinese General Administration of Quality Supervision, Inspection and Quarantine (AQSIQ).

If a slaughterhouse intends to export frozen beef to China, it must have a SIF number (a registration number required by the Brazilian Ministry for Agriculture (MAPA)) and it needs to pass the accreditation process agreed upon between the Brazilian and Chinese state level authorities. At this moment, an estimated 30 slaughterhouses are in the process of securing accreditation. The exact number is uncertain because it is confidential governmental information; however, the ABIEC confirmed on 24 May 2016 through personal communication with the researchers that to date 26 slaughterhouse plants have submitted enquiries to MAPA to be forwarded to the Chinese General AQSIQ office for accreditation. These slaughterhouses are

located in Brazilian several states, including Rio Grande do Sul, Goiás, Mato Grosso, and Minas Gerais, but are overwhelmingly located in the State of São Paulo (seven slaughterhouses), making the port of Santos the main beef exporting hub to mainland China.

This study estimates that an additional four slaughterhouses not associated with the ABIEC have recently applied for accreditation (this estimate is based on face-to-face conversations between the researchers and Brazilian industry members during their visit to China at the Salon International de L'Alimentation – China, Shanghai, 5-7 May 2016). Currently 16 Brazilian slaughterhouses are accredited to export frozen beef to mainland China, as confirmed by MAPA (communication to the researchers on 24 May 2016). Accreditation requires the candidate processing plants to complete a standard AQSIQ information questionnaire, then undergo on-site audits from AQSIQ's sister accreditation agency, the Certification and Accreditation Administration of the People's Republic of China (CNCA). At this stage of the supply chain, traceability is possible through the SIF number of the slaughterhouse and the date the animal was slaughtered and processed. These two items of information are made visible on the package of the product. Additionally, once again, along the chain the invoice between stakeholders of the different chain segments is used to track the transaction and product flow.

Accredited slaughterhouses are entitled to export to their Chinese partners directly or via traders. Traders are mostly used in the early stages of a slaughterhouse's forays into exportation (Lehtinen et al., 2016), when the slaughterhouse does not have enough knowledge of a particular foreign market, or its exported quantity is low (e.g. around 25 tons of frozen beef per week). Traders also help new-to-export plants to lower their financial risk by assisting importers with financing. Direct export to China is the method mostly preferred by larger exporters, which generally have better market knowledge, market positioning, and existing reliable contacts in China. Officially, beef can only be imported to China through a licensed importer. Licenses are granted by the China Chamber of Commerce of Foodstuffs, Native Produce and Animal By-Products (CFNA) and are product specific. The CFNA is a mixed organization, with an overwhelming government share operating under the Chinese Ministry of Commerce. Licensed importers have the right to further distribute frozen beef. Licensed companies typically including supermarkets, meat processors, or traders are given a specific quota that they are permitted to import into China. Although China does not have a specific beef import quota, it is understood

that the CFNA may act as a gatekeeper in ensuring that licensed importers have the financial ability to handle the product volumes for which they apply.

In China, following customs clearance and inspection by AQSIQ's local port branch inspection agencies, frozen beef products are generally transported to regional wholesale markets (which serve as further distribution centers inside mainland China), meat processors (which further process the Brazilian frozen beef, and possibly re-label it), or directly to supermarket chains. These facilities can be located both in large cities (Beijing, Shanghai, Guangzhou, etc.) and in second tier cities near inland cold storage and transportation hubs, such as Suzhou, Wuhan, Nanjing, Zhengzhou, etc. From these hubs, the beef is transported to various end-users. This may involve second, third, and fourth tier distributors (Longworth et al., 2001), which transport products from the larger hubs to smaller cities and less developed areas of the country. From there, local and regional supermarkets, small foodservice and catering outlets (hotels, industrial kitchens, restaurants, etc.), and traditional Chinese wet-markets prepare and sell the products to the final consumers. Online retail sales platforms for meat are currently in their infancy; however, they are gaining increasing importance in the Chinese meat market (Yiguo.com, 2015) and are now larger than in most developed economies. This is a result of general increases in online shopping by younger consumers and their families in China, and the development of logistic networks that can move goods to consumers quickly and cheaply. Although this marketing channel currently occupies a small share of total meat sales, its growth rate suggests it will be a major force in the meat marketplace in the future.

Once in China, traceability of the Brazilian beef becomes even more blurred. According to the most recent Food Safety Law (implemented in 1 October 2015), China applied a supply chain wide traceability law. However, implementation is still patchy in the sense that there is no national data collection system for following the movements of all animals and their related products. Certain urban areas and retailers have implemented traceability requirements for their products. Thus, traceability exists in the case of specific Chinese meat brands, which control and coordinate their whole supply chain in order to differentiate themselves to gain the trust of the end consumer. Nevertheless, after the Brazilian beef leaves the wholesale markets, or undergoes re-processing/re-packaging, tracing the meat's origin becomes a challenge.

Interrelated with the absence of a synchronized and harmonized traceability system along the Sino-Brazilian beef supply chain, the overwhelming majority of the Brazilian beef ends up in

Chinese restaurants and industrial kitchens (in the catering and food services segment), where, up until this moment, the detailed traceability of the meat's origin is not required. As the consumption of beef in China overwhelmingly occurs out of the home (Waldron et al., 2010), Brazil, with its frozen beef export, becomes China's most relevant external supplier.

Due to the large and growing volume of frozen beef trade between China and Brazil (71,431 metric tons in the first five months of 2016 (Ministry of Development Industry and Trade, 2016) and its possible consequences on production, consumption, and international relations, this study now explores, in depth, the major risks and challenges emerging in the supply chain, as outlined by beef sector professionals from both countries.

#### 4.2. IDENTIFICATION OF KEY STAKEHOLDERS AND INTERVIEW RESULTS

In order to identify the key Brazilian stakeholders that we would need to interview, we asked several Brazilian expert groups to recommend the most relevant and influential stakeholders. During various conversations, certain stakeholder names came up repeatedly. To be sure of each stakeholder's impact and knowledge of the chain, we confirmed the stakeholders background in public media releases, relevant websites and direct participation in country-country negotiations. Once we were convinced of their broad effect on the chain, we scheduled face-to-face interviews. The interviews in Brazil were conducted between 5 June and 8 July 2015.

In order to identify the relevant Chinese stakeholders, we asked several international expert groups located in China or working with the Chinese meat trade for their opinions regarding the most influential stakeholders in the chain. Thus, we selected Chinese stakeholders based on their company's representation during China's Food and Hospitality Trade Show (11-13 November 2015, Shanghai), and World of Food-powered by Anuga (18-20 November 2015, Beijing).

To source views from several chain members, the interview sample covered different segments of the chain. In total, 11 in-depth semi-structured interviews were conducted to establish an up-to-date impression of recent trends (Berg, 2001). The interviewees were directly involved in the management and negotiation of the beef trade between the two countries; the vast majority of the interviewees were leading players in the chain segments they represent (see table 1).

The interviews were planned based on the research objectives (Denzin and Lincoln, 2011), meaning in our case, the detection of vulnerabilities, risks and challenges in the Sino-Brazilian beef supply chain and its environment. We asked the interviewees to answer the following questions (depending on which part of the chain they belong to in (Figure 1):

- what challenges and risks does your organization face when exporting to mainland China? (in Brazil);
- what are the challenges and risks involved in handling the beef trade between Brazil and China? (international distribution); and
- what challenges and risks does your organization face when importing Brazilian beef? (in China).

Table 1: Interviewee codes used during the analysis, their occupation in the firm, and their brief firm profile

Interviewee code	Firm profile	Interviewee's position in firm	Segment of the chain
BRP1	Breeders association contains around 450 stakeholders with around 500,000 head of cattle. They have political influence and spokesmen in the Brazilian parliament.	President	Breeder (BR)
BRP2	Farmers association with around 200,000 members from all production areas. Substantial political influence and spokesmen in the Brazilian parliament.	Economic Director	Breeder (BR)
BRSL1	Slaughterhouses association with around 50 associated slaughterhouses, with political power, but no spokesman in the Brazilian parliament.	President	Slaughterhouse (BR)
BRSL2	Slaughterhouse with the capacity of slaughtering up to 800 cattle/day, without political power and spokesman as single unit.	General Director	Slaughterhouse (BR)
INT 1	Representative of the Brazilian Agriculture in the Brazilian Embassy in Beijing for 3 years.	Diplomat Brazil-China	International Governmental Agent (BR)
INT2	Agency with around 100 associated slaughterhouses, representing 30	CEO	External Agency for Information Flow (BR)

	<p>firms. The agency has substantial political leverage.</p>		
CHFP1	<p>Trading company with an estimated import volume of around 2000 tons of beef for 2016.</p>	International Trade Manager	Trading Company/ Processor (CH)
CHFP2	<p>Trading company with an estimated import volume around 5,000 tons of beef for 2016.</p>	International Trade Manager	Trading Company/Processor (CH)
CHT1	<p>Trading company with an estimated import volume of around 2,000 tons of beef for 2016.</p>	International Trade Manager	Trading Company(CH)
CHT2	<p>Trading company with an estimated import volume of around 1,000 tons of beef for 2016</p>	Owner	Trading Company (CH)
CHT3	<p>Trading company with an estimated import volume of around 500 tons of beef for 2016.</p>	President	Trading Company (CH)

Source: Authors elaboration

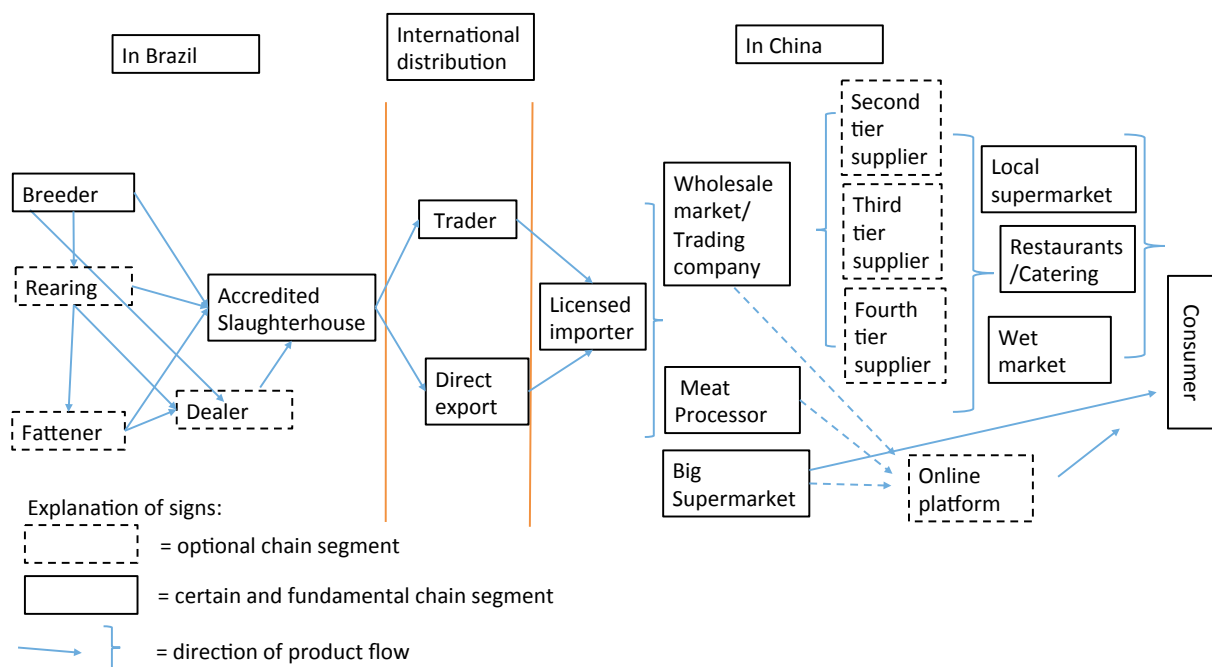


Figure 1: The supply chain of frozen beef from the Brazilian primary production to the Chinese end consumer

Source: Authors elaboration

The semi-structured guided interviews were open-ended, allowing interviewers to ask follow up questions specifically related to supply, demand, process, control, and environmental bottlenecks in the supply chain, as suggested by Christopher and Peck (2004), Jüttner (2005), and Van der Vorst and Beulens (2002). The interviews conducted in Brazil were recorded and transcribed. However, in response to the specific wishes of the interviewees not to be recorded, those conducted in China were only analyzed based on notes taken during the conversations.

Due to the exploratory nature of the research, we applied a positive approach (Silverman, 2006) in the interpretation of the content of the interviews. The decision to do so was based on the data triangulation we used to validate our coding and responses, and also because such an approach provides the opportunity to induce hypotheses that can be further addressed through quantitative research. Although our sample was relatively small, we consider the responses obtained wide ranging, due to the size of the organizations the interviewees represent and their political influence.

Qualitative content analysis was conducted manually, using a systematic approach towards defining the major categories first (supply, demand, process, control, environmental risk) and then broken down to the specific themes that emerged from the interviews, listed in Table 2, under column “Risks mentioned by Interviewees”. After defining the specific themes emerging from the interviews, we identified which interviewees mentioned the specific themes.



Table 2: Number of interviewees who mentioned a specific theme regarding the Sino-Brazilian Beef trade

Risk type	Risk mentioned by interviewees	Interviewees who mentioned the specific risks						
Process	Mass production commodity oriented	BRP2	BRSL1	INT2	CHT3	CHFP1		
Process	Little product and process flexibility	BRP2	BRSL1	INT1	CHT2	CHFP1		
Process	New product development based on in-house capability and technology	INT1						
Process	Slow customer response	CHT3	CHT2	CHFP1				
Control/Process	Delays of shipment	CHT2	CHFP2	CHFP1				
Demand/Supply	Little cooperation between the segments	BRP1	BRP2	BRSL1	BRSL2	CHT3	CHFP1	CHFP2
Supply	Supply insecurity	BRP1	BRP2	BRSL1				
Control	Price oriented transactions	BRP1	BRSL1	BRSL2	CHT1	CHFP2		
Control	No existing contract between Brazilian and Chinese firms	CHT1	CHT2	CHFP1				
Demand	Limited marketing of Brazilian beef in China	CHT1	CHT2					
Control	No existing contract between Brazilian slaughterhouse and Brazilian farmers	BRP1	BRP2	BRSL1	BRSL2			
Demand	Lack of information on final consumers in China	BRP1	BRSL1	BRSL2	INT1	INT2		
Control	Complications through regulatory environment	BRP1	BRSL1	BRSL2	INT2	CHT2	CHPF1	CHPF2
Environment	Sanitary condition a risk	BRS1	INT1	INT2				
Supply	Limited knowledge on production in Brazil	BRP1	BRSL1	CHT2	CHPF1	CHPF2		

*Number of Interviewees who mentioned the risk factor*      1                      2                      3                      4                      5                      6                      7

Source: Authors elaboration

We used the general interview code (see in Table 1) to identify and visualize the results of the coding. Additionally, we counted how many interviewees mentioned a specific theme.

To guarantee the objectivity of the coding, two researchers independently defined the categories. In the case of doubts over decisions and the coding scheme, a third researcher provided assistance.

Based on the above-mentioned coding procedure, the results displayed in Table 2 were obtained.

As with other commodity food products, such as coffee, soy, corn, etc. (Wilkinson et al., 2015), beef exported to China from Brazil is produced mostly at large-scale abattoirs and with low added value. This is partly explained by the animal origin and the environmental surroundings (climate, region-specific flora and fauna: Nabinger et al., 2009). Another reason is that most Brazilian slaughterhouses prefer in-house development instead of closer cooperation

with international stakeholders. These factors create barriers to fast adaptation to dynamic external markets such as China, and as such trigger comments from Chinese importers as “Brazilians seemingly do not want to adapt to our standards” (CHFP1).

Standards and the regulatory environment play a fundamental role in the transnational supply chain, mainly affecting the segments that connect the two countries with each other (e.g. Brazilian slaughterhouses, traders, and Chinese importers). To be allowed to export to China, Brazilian slaughter plants must gain accreditation through the process detailed in Subsection 3.1. Although trade follows international rules and does not impose technical barriers, the time investment required in the plant’s accreditation process is extensive. As INT2 stated, “Today, the Chinese technical requirements are not too strict”; however, time delays during the accreditation process create higher transaction costs for slaughter plants. As BRSL2 stated, “it is a great problem of investment and return how much time all these processes of export and export accreditation take due to national and international bureaucracy”. An additional regulatory restriction, from the general observations of the authors, is that Brazilian slaughterhouses and traders only have access to export related information (e.g. the export protocol) if they are part of a Brazilian export organization or association. Thus, information becomes a competitive factor giving advantages to specific representatives in the Brazilian beef sector.

There is also a cultural proclivity in Brazil that presents an additional challenge, in both supply-demand relations and the regulatory environment. This is called “jeitinho” (Duarte, 2006), which derives from a Brazilian Portuguese expression meaning to “find a way”, and can be understood to mean creative problem management. This can lead to additional transaction costs in crucial points between the segments. One result of this can be observed through the interpretations of the Chinese traders:

*Brazil entered with its first 2-3 containers and they could not unload their shipments because there were some problems with the documentation. That was causing already in the beginning of our relations complications due to our own planning related to the punctuality of the shipments. (CHFP2).*

*Brazilians are not prepared with papers. That cost a lot of people a lot of money because commodities stay in the port (CHT2).*

Thus, the effects of the regulatory environment through long-lasting bureaucratic processes and distinct cultural impacts create information shortages or mishandling, causing losses and risk factors in every segment of the chain on both the Brazilian and Chinese sides.

In general, information availability in the supply chain supports all the supply chain activities, and can reduce costs, increase supply chain responsiveness, and even help to improve the whole chain's competitive advantage in the global context (Mason-Jones and Towill, 1997). However, this kind of knowledge exchange has still not occurred in the Sino-Brazilian beef trade: the chain segments have mutually limited knowledge of each other.

When the Chinese traders were asked, "Could you tell us please what you know about the Brazilian beef products, processing industry, and primary production?", their responses were simple, short, and very repetitive, even though independent people were questioned at independent times and locations. The following answers were repeated in different ways: "We know that Brazilian production costs are low" (CHPF1); "We know that the Brazilians have a lot of natural beef, which is important for our quality" (CHFP2); and responses along the lines of "price is ok" (CHT2). The homogeneity of answers gives the impression of fairly limited information, derived from one unified source. The absence of organized information and detailed knowledge among Chinese traders on the Brazilian beef sector, certain facts, such as the recent challenges of primary beef supply and its organization in Brazil, are ignored. This creates risk factors due to limited knowledge of the supply.

The Brazilian beef sector is currently experiencing a lack of cattle and proper long-term planning in its supply. As stated by a Brazilian slaughterhouse representative, "we have recently experienced a great lack of animals in our own state and in other parts of Brazil" (BRSL2). This situation leads to price competition between the slaughterhouses and increases the price of cattle. BRSL1 added:

*The scale in the slaughterhouses is set only one month in advance. It is never based on long term planning. Tomorrow is the 2nd of July. The slaughterhouse will not know how much it will slaughter from the 10th of July.*

The short-term planning of Brazilian slaughterhouses results in missing information from the perspective of Chinese traders. The scarcity of information on Brazilian cattle and beef supply limitations hinder Chinese supply chain members from calculating shipping times and prevent the establishment of long-term collaborative relationships between Brazilian exporters and Chinese importers.

The lack of systematic information regarding the Chinese stakeholders is also a current challenge in the Brazilian beef sector. Nevertheless, in Brazilian slaughterhouses, information scarcity is not a concern: rather, the reliability of the knowledge obtained presents difficulties. As BRSL2 raised:

*Today we get a lot of information, in reality too much, from too many places. Therefore, we need to filter all the information, in order to know what the trustworthy sources are. The majority of the information we receive is from people who work with some kind of export and import, and they only see a business opportunity. This happens really often.*

The great amount of information received by the slaughterhouses becomes difficult to process. It creates additional transaction costs to distinguish reliable and unreliable sources, thereby also generating an extra risk factor in sales and production planning. Information scarcity regarding Chinese demand dynamics also presents challenges for chain specialists. As BRT2 stated, “We do not know the market too well”. Thus, to the average Brazilian exporter, the Chinese beef market and the forces shaping beef and beef import demand are opaque. Therefore, both the Chinese and Brazilian segments share the mutual problem of planning their supply chain activities due to the lack of reliable information sharing between the chain segments.

Chain governance in the Brazilian beef industry is rather unusual (Barcellos et al., 2011). The transaction between farmer and slaughterhouse is mostly handled in spot markets, and can be based on immediate payment or payment within 30 days. As stated by BRSL2:

*Relations between us and the farmers is more a question of opportunity. We, today do not work with any farmer based on contracts, which is because of the great lack of animals now in the state. So we are not able to plan with a great and long-term scale.*

Opportunity and price driven decisions dominate the relations between primary material producers and processors (Barcellos et al., 2011). BRSL1 commented, “Here we do not have, like in the rest of Brazil, loyalty. The farmer sells to the slaughterhouse which offers a highest price or offers reliable payment”. The disadvantages of such a system are short term inventory planning, inconsistent quality, and volatile primary material prices, which in turn causes unpredictability in the supply of beef products throughout the whole chain. Contracts between Chinese and Brazilian parties depend in general on both parties’ firm policies: if contracts are made, they are based on agreed delivery dates, quantity, and price.

More established trading firms or food processors, due to their position and reputation in the Chinese market, prefer such contracts. CHT2 stated, “We know what we need, and we try to make contracts accordingly”. However, several traders prefer to adapt to the changing market conditions. As CHT1 observed, “we do not do contracts because the market is changing too fast”. The Chinese beef market is known to be dynamic due to the rapidly rising consumer demand (Waldron et al., 2010), especially during wintertime, and the lack of access of major beef exporting countries (e.g. the USA and India), which create a volatile “grey channel” for unofficial products. The opening and closing of this grey channel causes imported beef prices to fluctuate considerably, leading to an opportunistic but also risky business environment, favoring short-term buying and selling.

The beef market is not only driven by demand and supply, but also other policies including sanitary and other import regulations (Jarvis et al., 2005). The international beef market is segmented and strongly influenced by country disease status and quality (Morgan and Tallard, 2015). The sanitary terms of the Sino-Brazilian beef trade protocol generally meet the standards of the World Trade Organization. Working under these standards, most of the Chinese traders and food processors are satisfied. However, in the Brazilian industry there is great concern to ensure continued market access under the constant sanitary risks. Brazil has already endured a three-year ban on exports to Mainland China (Brazilian Ministry of Agriculture Livestock and Supply, 2015). The possibility of a repeat ban was demonstrated in the concerns of the Brazilian sector representatives:

*We (Brazil) had difficult episodes in the last ten years. We had the case of Foot and Mouth Disease in Parana in 2005. After that, in 2011-2012, we had the case of atypical Bovine Spongiform Encephalopathy (BSE). In these moments, all the markets closed their importation of the Brazilian products. After that, when the problems were resolved and the herd got its clean sanitary status back from the World Organization of Animal Health (OIE), most of the importers went back to the normal way of trade. But not China. China delayed three years to lift the embargo (BRT1).*

Thus, Brazilian beef professionals are not worried simply about a ban, but more concerned over its potential duration. To reduce these risks, the Brazilian government has implemented several measures (vaccination programs, governmental educational programs, health protocols, etc.) to prevent sanitary challenges nationwide (Brazilian Ministry of Agriculture Livestock and Supply, 2009).

Apart from the sanitary threat factor (environmental risk), the supply, process, demand, and control risk aspects cited by the interviewees in relation to the Sino-Brazilian frozen beef supply can be attributed to the shortcomings in the information flow. Although missing data flows in the supply chain might not directly impact the quantity of beef traded between the two countries, the interviewees' observations certainly demonstrate the (possibly fatal) impact of lack of organized information during periods of the slightest external and/or internal shock.

## **5. CONCLUDING REMARKS AND POLICY IMPLICATIONS**

The research results allow us to draw three main conclusions and indicate their policy and managerial implications. The first concerns the risks associated with the traceability system; the second, the risks inherent to the scarcity and unreliability of information; and the third, involves the combined implications of these two risks in relation to trust along the whole supply chain.

The control structure of the Sino-Brazilian supply chain is based on the traceability system. However, although the system is officially supposed to facilitate traceability, in fact it functions more as a tax control structure (due to the invoice-based control approach) than as a product flow tracing and control mechanism. The traceability mechanisms along the beef supply chain are neither unified nor digital. Integration is almost completely lacking between the different

stakeholders. Thus, there is considerable mistrust between the different stakeholders, as shown during the interviews. This does not necessarily deter the occurrence of transactions between the different stakeholders, but it does impede harmonic business relations, leading to purely price-based operational transactions. This situation reveals the infancy of the Sino-Brazilian beef trade, one of the major global beef channels.

In addition to the lack of information throughout the traceability system, and the absence of an integrated communication platform between the stakeholders, the very limited promotion of Brazilian beef in the Chinese market leads to a rather limited knowledge of its quality attributes along the supply chain segments. This further challenges the sustainability of the Brazilian beef exports and prevents the formation of trust-based relationships due to the lack of information on the product and its handlers throughout the supply chain. Without trust and close co-cooperation between the stakeholders, commitment to the product is negatively impacted. The frequent changes of stakeholders from the up and downstream segments and the impossibility of long-term planning lead to losses in time and financial investments. This weakness ultimately effects product quality and most importantly, it can also affect its safety.

The weak traceability system and the absence of an efficient and up-to-date information sharing system engender systematic uncertainties and lead to mistrust between stakeholders along the chain. To overcome such pitfalls, Brazil can learn from Uruguay's and Argentina's experiences. These countries devote large financial and human resources to such activities as marketing and branding throughout China. In both cases, providing the consumers with information has improved cooperation between the countries and facilitated long-term buyer-supplier partnerships. Consequently, during recent years their supply chains have been more resilient against price fluctuations. Investing in the reputation of their products among Chinese consumers has positively enhanced chain performance for these two fellow South American countries.

Without similar strong promotional activities in mainland China, Brazilian beef prices are likely to remain the major driving force behind Chinese purchases. This suggests a vicious circle of low levels of trust and frequent supplier exchangeability, making the chain particularly vulnerable to any external and/or internal impact: traits that characterized the supply environment of the 1950s and 1960s (Tan, 2001).

Thus, we propose the implementation of a Brazilian federal traceability system that would ensure a more efficient, organized, and synchronised way of tracing the product flow, which also opens possibilities for Brazilian stakeholders to know their chain partners. Such a system should be adapted to the Brazilian reality of large-scale production and should offer efficient online access connected to barcodes with detailed product information. This would aggregate value to the product through increased trust in the business partners, and it would facilitate the real-time detection of any kind of product-related risk factor. We also urge cooperation between the private and public sectors to initiate the construction of an online platform that would allow the basic information needed within every chain segment (such as carcass weight, origin, quality and quantity needed by the different stakeholders) to be shared and, at the same time, offer stakeholders match-making based on their in-house capabilities. Furthermore, we urge for greater investment in the marketing of Brazilian slaughterhouses and producer associations in cooperation with their Chinese partners, so that the Chinese consumer can gain more knowledge and, with it, come to trust the beef delivered from that origin.

As follow up research, we suggest testing the hypothesis regarding the intensity of the risks generated by weak traceability and information unavailability throughout the supply chain. We urge for further research in the areas of important determinants of purchasing decisions, such as the availability of credit, certain quality claims, and consumer preferences in terms of meat quality and country of origin in the Chinese market. Additionally, intensification of academic-private sector collaboration can bring critical elements for the construction of an appropriate business continuity plan that ensures strategic and operational resilience (Manning and Soon, 2016) at the supply chain level. Also, this study suggests the need to develop an easy-to-access information platform covering all the segments and providing clear guidance on national and international beef product regulations for both the Chinese and Brazilian supply chain partners.

## **6. LIMITATIONS**

As it was hoped that this study would involve a larger number of senior actors in the chain, the relatively limited number of participants means that the sample may be too small to completely generalize the findings to all firms in the supply chain. Additionally, it needs to be taken into consideration that the interviews were conducted at a time when the beef trade



between the two countries had only recently resumed. Moreover, social, cultural, and language distance between the interviewees and the interviewer might have biased the responses given, although this study tried to minimize this possibility with the triangulation of trade data, official documents, and already existing literature in the field of the beef trade and supply chain management.

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**CHAPTER V. - INFORMATION RECEIVED BY DIFFERENT BRAZILIAN BEEF  
PACKERS REGARDING THEIR CHINESE MARKET<sup>3</sup>**

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## **1. ABSTRACT**

Considering the opportunities offered by the Chinese beef market and fragilities in the Sino-Brazilian beef trade supply chain, this research identifies the information sources and channels the Brazilian beef packers have used to organize, govern and manage their supply chains. The results reveal that the Brazilian beef packers or institutions within the export sector know little regarding the Chinese market. The size and export experience of the beef packers were found not to influence their level of knowledge of the Chinese beef market. The sector neither has a unified database that includes the essential information regarding the Chinese market nor a unified traceability system in place that could facilitate the information flow among the agents across the beef trade supply chain. Thus, firms need to dedicate substantial management resources (time, financial, human) to collect information and knowledge from various sources.

### **Keywords**

Sino-Brazilian beef trade, Chinese beef market, Market knowledge, Traceability, Beef packer.

## 2. INTRODUCTION

Since the 1990s, food safety has come into the focus of the increasingly urbanizing and socially diversifying Chinese consumers. Food safety scandals have become the unwanted consequences of a highly fragmented food production and supply chain (Lam *et al.*, 2013). Despite government efforts to minimize such hazardous events (Waldron *et al.*, 2010), the Chinese food safety regulatory framework and state owned certification and controlling bodies have proven to be of limited effect (Linhai *et al.*, 2013). In many cases, Chinese consumers trust the foreign food safety controlling bodies more than the Chinese inspection systems, which they perceive as less reliable (Sun *et al.*, 2014). As a consequence, imported beef (legally or illegally) is an attractive alternative for the Chinese, not only due to the diversification the new products offered and the prestige related to their consumption, but also because they are seen as a healthy alternative to pork (Longworth *et al.*, 2001). This factor together with the dependency on imported beef, due to the impossibility of China attaining production self-sufficiency (Waldron *et al.*, 2015), creates great opportunities for big beef exporting countries such as Brazil to expand their markets and revenues. The trade between Brazil and China is expected to grow, as indicated by Tinbergen (1962) in his “gravity model” and recent studies conducted by authors such as Squartini and Garlaschelli (2013). However, to be able to supply the growing consumption in China (estimated 4.5 kg/per capita/year in the urban areas (Chinese Animal Husbandry Association 2015)) the country needs to import beef. Therefore, Brazilian producers face a dual challenge, to meet the high demand volume presented by the Chinese beef market and to ensure a safe product that matches the specific preferences of Chinese consumers.

This is even more relevant given the huge amount of beef Brazil has exported to mainland China, which, in the first semester of 2016 alone, attained the impressive mark of 91,124 tons (Brazilian Ministry of Development Industry and Foreign Trade, 2016). Notably, although this trade only started in June 2015, in terms of volume, it is already among the largest international beef flows. After conducting a systemic mapping of the Sino-Brazilian beef supply chains, and their shortcomings (Knoll *et al.*, 2017), it was found that the Brazilian traceability system is based on fiscal/commercial documents (SIF), rather than product follow-up, the information flow between the stakeholders is dysfunctional, and that opportunistic business behaviors dominate the whole supply chain.

Research reveals that aligning the information flow and the production and trade practices among the different members is a basic necessity for a supply chain to be effective and competitive (Cooper *et al.*, 1997; Jie *et al.*, 2013). A well organized and managed supply chain encourages cooperation and reliable relationships between its members and improves the effectiveness of the whole supply chain in identifying and responding to market opportunities (Lambert *et al.*, 1998; Simatupang *et al.*, 2002; Jie *et al.*, 2013; Ding *et al.*, 2014). Thus, the present research focuses on the specific case of what defines information availability and actual market knowledge of the Brazilian beef packers regarding the Chinese beef market.

Considering the opportunities offered by the Chinese beef market and the fragilities identified in the Sino-Brazilian beef trade supply chain (Knoll *et al.*, 2017), this research explores the experience of the Brazilian beef packers that are exporting or are applying for accreditation to export to China. Analyzing this population, we aim to identify their information sources and the channels they employ to organize, govern and manage their supply chain. The deeper analysis of the information flow and its peculiarities provided by this research should represent a first step towards improving chain coordination and governance, which, in turn, should contribute to ensure a safer, healthier and more attractive business environment for all the chain stakeholders, and the final Chinese consumer. By evaluating the information sources, content and flow it is possible to assess the extent to which the absence of a unified traceability system impacts the current availability of information in the chain. Based on that assessment, more specific suggestions can be made regarding the building of information sharing and processing systems, which may be adapted to the Brazilian and Chinese situations.

Thus, following this introduction, there is a description of the theoretical framework used to support the methodology. Then, details of the methodological approach based on the specifications of the Brazilian beef industry are provided. Finally, there is a discussion of the results obtained from the questionnaire and interviews.

### **3. THEORETICAL FRAMEWORK**

To build the research theoretical framework, first the role of information and knowledge sharing in foreign markets in the supply chain management context is explored. Then, how that might be related to a firm's size and level of experience with exports is discussed. The aim is to

identify and evaluate the different information sources and the current knowledge held by different Brazilian slaughterhouses regarding the Chinese beef market.

### 3.1.SUPPLY CHAIN MANAGEMENT AND INFORMATION

Supply chain management (SCM) requires the integration of organizational units from end to end in the supply chain through products, information, financial flows and coordinating mechanisms in order to attend the customer demands and add value for customers and to the chain shareholders (Lambert *et al.*, 1998; Stadtler, 2005). This approach is particularly challenging when working with food supply chains, considering the associated product and process specificities (perishability, contamination, food safety and security, shelf life, etc.) (Van Donk *et al.*, 2008). Food supply chain structuring and management analysis has become a relevant matter due to its ability to track vulnerabilities and risks endangering food safety (Van der Vorst and Beulens 2002; Ding *et al.*, 2014) and its interdependence in business transactions, which can affect every stakeholder in the chain (Gereffi, 1994). Certain practices can help prevent pitfalls in the supply chain, leading to more effective chain management, namely: strategic partnerships with suppliers, continuous process flow, outsourcing, cycle time compression, quality certification, customer relationships, use of inter-organizational systems such as electronic data interchange (EDI), and the elimination of inventory excess (Tan, 2001; Alvarado and Kotzab, 2001). A considerable amount of literature highlights the importance of information accessibility, quality and sharing between the different stakeholders in the supply chain (Tan *et al.*, 2002; Min and Mentzer, 2004; Prajogo and Olhager, 2012; Jie, *et al.*, 2013; Ding *et al.*, 2014). Information sharing is essential for company success, especially when it comes to transnational operations (Bartlett and Ghoshal, 1989) and positively impacts a firm's operational performance (Frohlich and Westbrook, 2001; Prajogo and Olhager, 2012; Zhou, 2007; Jie *et al.*, 2013). On the other hand, from a supply chain point of view, a lack of coordination between stakeholders can yield negative consequences such as higher inventory and transportation costs, longer delivery times, higher levels of product loss, customer service inefficiency, and imbalance between supply and demand forecasting, etc.(Akerlof, 1970; Lambert *et al.*,1998; Lee *et al.*, 1997; Simatupang *et al.*, 2002).

Information can be an expensive asset. Thus a crucial decision for a firm is to determine whether or not to acquire expensive information and, if so, what kind of information is needed (Fu and Zhu, 2010). Nowadays, internet and other web-based technologies have a growing positive impact on the maximization of such demands (Gimenez and Sierra, 2013). When no unified electronic information exchange mechanism exists, one of the most essential knowledge exchange mechanisms between firms is partnering between employees. However, this is less likely to happen among firms geographically distant from each other since, generally, distance has a negative impact on information flow (Morosini *et al.*, 1998). Also, information exchange among geographically distant places presents additional hurdles such as different time zones and long transmission channels, which, all together, have a negative impact on the amount and quality of information exchanged. However, distance can be a motivator for the development of new solutions to solve information transfer issues. Thus, distance is not in every case an inhibitor of smooth knowledge flow. Nevertheless it certainly impacts the effectiveness of certain information transfer mechanisms (Tihanyi *et al.*, 2005; Ambos and Ambos, 2009).

### 3.2.FIRM SIZE

According to Bonaccorsi (1992), larger firms have a competitive advantage when it comes to dealing with foreign markets, due to their greater managerial and financial resources and greater access to information. Other studies have also indicated the existence of a positive relationship between firm size and internationalization (Calof, 1993; Baird *et al.*, 1994). Small companies tend to perform less well when it comes to internationalization, due to their lack of financial and human resources to proceed with the internationalization process or to gain knowledge and understand the desired foreign market (Etemad, 2004; Pangarkar, 2008; Knight and Kim, 2009). Additionally, Julien and Ramangalahy (2003) found that small firms seem to have difficulty with the core competences of distribution, pricing, and monitoring the foreign market etc. On the other hand, the structure of small and medium-sized companies facilitates greater flexibility and speed in the decision making process (Cretoiu, 2010), due to the absence of internal bureaucratic hurdles, processes and protocols (Knight and Kim 2009). This can be seen as a competitive advantage under rapidly changing market conditions, as is the case in China.



### 3.3. INTERNATIONALIZATION OF A FIRM

The market itself is a network of relationship where firms are linked to each other in various visible or invisible ways (Johanson and Vahlne, 2009). Thus, being part of a relevant network opens possibilities through knowledge and trust between the different network partners, and makes them insiders in operations relevant to the sustainable flow of business. Consequently, internationalization in general has a positive effect on firm performance and its access to information (Barkema *et al.*, 1996; Li, 1995). A study by Cunningham and Homse (1986) shows that during a firm's internationalization process, managers in both the home and foreign markets develop valuable contacts based on social relations and a certain routine of conversation, which leads to fruitful information flows. This not only allows for the accumulation of knowledge regarding their respective markets and processes, but also promotes trust, which can result in greater commitment (Hunt and Morgan, 1994). Thus, common ties and a certain unilateral dependence increase a firm's performance and productivity and facilitate closer cooperation with a network partner. The stakeholders may eventually develop mutual knowledge showing opportunities that are unavailable to those who do not cooperate to the same extent (Zajac and Olsen, 1993).

Direct networking may not be the only option, intermediaries can help facilitate the flow of goods too (Root, 1987). Often such intermediaries are specialized service firms, which serve as an outsourced export department of the company interested in a foreign market (Peng *et al.*, 2008). The literature also discusses, how smaller firms, in particular, tend to hire third parties that provide market intelligence to facilitate access to a foreign market (Terjesen *et al.*, 2008; Hessels and Terjesen, 2010). In which situation a firm contracts an export intermediary mostly depends on the firm's ability to handle the size of the foreign market, the expected financial risk and the cultural difference assessed by the local firm's management (Felbermayr and Jung, 2011). It is also important to note that although intermediaries can facilitate trade, their use may lead the local firm to lose control over its exportation processes (Blomstermo, Sharma, and Sallis 2006).

Thus, in the following section, the aim is to identify which information sources are most commonly used by the companies, (network or intermediary-based), how this varies among different sized firms, and how this affects the firm's market knowledge.

#### **4. RESEARCH GOALS**

Based on Katsikeas' (1994) perspective, here it is assumed that a basic knowledge of the targeted foreign market leads to a more effective attendance of the foreign customer's requirements, which is likely to improve export performance levels compared to competitors. Thus, at this point, it is necessary to determine what kind of information different Brazilian beef packers possess on the Chinese market.

The aims of the administered questionnaire are to assess:

- In what ways Brazilian beef processors receive information from the Chinese market
- To what extent Brazilian slaughterhouses are aware of the recent tendencies in the Chinese market related to cuts, market segmentation and business behavior.
- Whether the knowledge held by Brazilian slaughterhouses is related to company size and/or level of internationalization.

#### **5. METHODOLOGICAL DESIGN AND ITS JUSTIFICATION**

Firstly, the use of a specific population to answer the research question is justified. After which, the methodological approaches applied when answering the research question are described.

##### **5.1.JUSTIFICATION OF THE POPULATION USED IN THE RESEARCH**

Beginning with the Sino-Brazilian supply chain as a whole (from the Brazilian farms to the Chinese consumers), it was decided to conduct an in-depth analysis of the Brazilian beef packers' knowledge regarding the Chinese market, due to the packers direct involvement with

requirement and legislations of their foreign market (Knoll *et al.*, 2017). Thus, in Brazil, these stakeholders can be assumed to be those most directly affected by tendencies within the Chinese beef market. Consequently, within the Brazilian section of the supply chain, the Brazilian beef packers should have the broadest and most in-depth information and knowledge regarding the Chinese market.

Although well-known for the decentralized nature of its beef processing sector in the past (Jank *et al.*, 2001), promoted by the Brazilian government, the scale, production and level of centralization of the Brazilian agro-export sector has grown in the recent years. The ongoing centralization is reflected in the fact that today only 3 firms detain more than 60% of the whole beef slaughter and processing industry in Brazil (Vieira and Traill, 2008). Thus, although Brazil is a great beef exporter, only a few firms, owning several packers, are relevant in the export sector. Market and export related decisions are not made at the level of the individual packer, but at the central headquarters and export departments of the holding firms. Thus, we aimed to get information from the central headquarters of the holding firms instead of contacting each packer individually.

The aim was to get evidence from a specific target group of beef processing firms, namely, those with experience of exporting to Hong Kong (which serves as an entrance to China, Knoll *et al.*, 2017; Hoang 2014; U.S. Meat Export Federation 2014), those in the process of acquiring accreditation to export to China, or are already accredited to export to mainland China. To get the largest possible sample of such establishments, we sought the support of the Brazilian Beef Processors and Exporters Association (ABIEC). See Figure 1.

ABIEC is currently the most recognized export body within the Brazilian beef sector, consisting of 26 associated companies, representing around 96 slaughterhouses or 39% of the total amount of Brazilian beef slaughterhouses subject to Brazilian Federal Inspection (SIF-*Serviço de Inspeção Federal*) registration (Brazilian Ministry of Agriculture Livestock and Supply 2016). SIF registration is mandatory for every slaughterhouse seeking to distribute its products throughout the whole Brazilian territory, or to export to destinations with basic requirements such as Hong Kong, Uruguay, Argentina, Vietnam, Peru, Venezuela, Israel, Egypt, etc. However, if a slaughterhouse wants to obtain accreditation to export to mainland China, it needs to be part of the SIF, and additionally, it needs to fulfill requirements agreed upon between the Brazilian and Chinese state level authorities (Knoll *et al.*, 2017).

Of the 96 slaughterhouses associated to the ABIEC, 15 are accredited to export to Mainland China. Only one Brazilian slaughterhouse accredited to export to Mainland China is not a member of the ABIEC. As of today, among the slaughterhouses associated to the ABIEC, all are accredited to export to Hong Kong (since the accreditation only requires SIF registration) and at least 23 slaughterhouses are in the process of applying for accreditation to supply Mainland China.

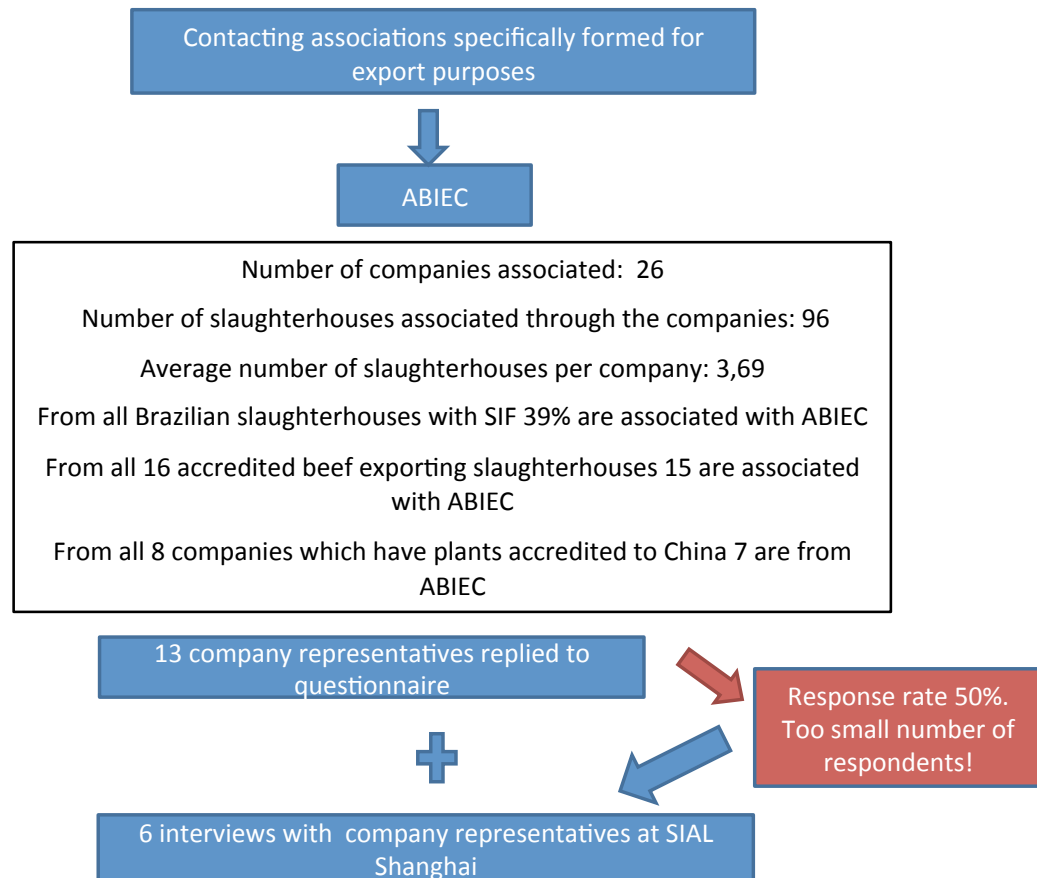


Figure 1: Methodological design and its justification

Source: Elaborated by the authors

## 5.2.METHODOLOGY

To provide the most accurate and complete picture regarding the research object, and due to the nature of the sector under analysis, this study is based on exploratory and descriptive data analysis (Miles *et al.*, 2013). Firstly, a questionnaire was prepared for the specific target group of

Brazilian beef processing firms. Later, due to the small number of responses, to complement the survey, interviews were held to achieve a higher response rate and a more holistic understanding of the subject.

#### 5.2.1. Development of the questionnaire

The questionnaire was designed to provide analyzable data regarding the research goal (Miles *et al.*, 2013). The questions were reviewed and discussed by our team of researchers and 5 international industry professionals (with at least five years of direct involvement and experience of trading beef in China), regarding their importance, and possibility to act as proxies for the research goal. The questionnaire was designed to take no longer than 10 minutes to answer and was provided and filled in online (Survey Monkey). The link to the online platform, and the explanation for the research was forwarded by ABIEC to all members, with a request to cooperate by responding to the survey tool. Responses were expected from the export department, administrative departments or CEO's office of every firm associated to ABIEC (26 in total). It was hoped to achieve statistically analyzable census (response rate over 80%) due to the direct involvement of ABIEC in forwarding the questionnaires.

The questionnaire consists of three main parts, *Part A* and *Part B* and *Part C*, which correspond to the research questions.

*Part A* collects information related to firm size and export profile, *Part B* evaluates the information attributes obtained by Brazilian companies regarding the Chinese beef industry and *Part C* measures the current knowledge held related to the Chinese beef market and its environment.

Only 13 companies responded the questionnaire, of which 10 had at least one slaughterhouse in the process of applying for accreditation for China, and one company already had one accredited slaughterhouse plant for China. Two companies had not even applied for accreditation to export to mainland China, but exported to Hong Kong. Responses were received between April 3<sup>rd</sup>, 2016 and May 11<sup>th</sup>, 2016.

#### 5.2.2. Development of Interviews

To get a wider range of responses we opted for short interviews with slaughterhouse representatives that had not answered the questionnaire. To ensure the right population of respondents, members of the research team attended the *Salon International de l'alimentation*, or SIAL, in Shanghai 2016 (May 5<sup>th</sup> -7<sup>th</sup>, 2016) the biggest networking event and tradeshow in Asia. At SIAL Shanghai, ABIEC was represented by 14 companies. When contacting each one of them, a general introduction to the research was given, and the representatives were asked whether the company had received and responded the questionnaire sent through ABIEC. If the answer was negative, the representative was invited to participate in an interview. In the end, 6 interviews were conducted. Due to the business nature of the event, the time available to speak to the company representatives was limited (5 minutes per company on average).

The interviews were prepared based on the research goal (Denzin and Lincoln, 2011) and the dynamic circumstances in which they were conducted. The semi-structured interviews were open-ended, which allows the interviewers to ask follow-up questions. The interviewees were not recorded, instead notes were taken during the conversations out of respect for specific requests made by some interviewees and the fair's business sensitive environment. When interpreting the interviews an interpretive approach we taken as a guide (Livesey, 2006), which offered the chance to adapt our questions and observations to the dynamic environment.

Two main questions were asked regarding *part B* of the questionnaire:

*(A) What do you know about the Chinese market that makes you want to sell or enter it?*

*(B) Where do you get any further information on the Chinese market that might enable you to do business?*

Based on the information contained on their business cards and the company homepages, company profiles were elaborated (corresponding to *part A* of the questionnaire). However, there was no opportunity to assess the level of knowledge held regarding the Chinese market (corresponding to *part C* of the questionnaire), due to time limitations and sensitive nature of the situation.

## 6. RESULTS AND DISCUSSION

Together, 13 completed questionnaires were received and 6 interviews were conducted with representatives from different firms, out of the total of 26 firms associated to ABIEC (see Table 1 and Table 2).

Table 1: Profile of respondents to the questionnaire (position/company size/accreditation)

Responses	Responsibility in company	Number of packers	Size of biggest packer	Joint investments/head quarters / outside of Brazil?	Number of export dest. (max score 9)	Accredited or in process
Quest 1	Federal Agricultural Inspector	2	Between 500 and 800 animals	No	4	In process
Quest 2	Financial and Office Administrator	1	Between 500 and 800 animals	No	0	Have accredited
Quest 3	Quality Guarantee Manager	1	Between 500 and 800 animals	No	0	No
Quest 4	Quality Guarantee Manager	4 or more	Between 800 and 2000 animals	Yes	6	In process
Quest 5	Export Manager	1	Between 500 and 800 animals	No	3	In process
Quest 6	Export Manager	3	Between 800 and 2000 animals	Yes	2	In process
Quest 7	Export Manager	4 or more	More than 2000 animals	No	2	In process
Quest 8	Export Manager	1	Between 500 and 800 animals	No	5	In process
Quest 9	Production Manager	2	Between 500 and 800 animals	Yes	3	In process
Quest 10	General Manager	3	Between 500 and 800 animals	No	4	In process
Quest 11	Export Manager	4 or more	Between 800 and 2000 animals	Yes	5	Have accredited and in process
Quest 12	Export Manager	4 or more	Between 800 and 2000 animals	Yes	1	In process
Quest 13	Financial and Office Administrator	4 or more	More than 2000	Yes	5	No

Source: Elaborated by the authors

Table 2: Profile of the interviewees (position/company size/accreditation)

<b>Responses</b>	<b>Responsibility in company</b>	<b>Number of packers</b>	<b>Size of biggest packer</b>	<b>Joint investments/headquarters / outside of Brazil?</b>	<b>Number of export dest. (max score 9)</b>	<b>Accredited or in process</b>
<b>Int 1</b>	Export Manager	4 or more	Over 2000 animals/day	Yes	7	Have accredited and in process
<b>Int 2</b>	Exportation manager	2	Over 2000 animals/day	No	4	Have accredited and in process
<b>Int 3</b>	C.E.O.	3	Between 500 and 800 animals/day	No	4	Have accredited and in process
<b>Int 4</b>	Export Manager	3	Over 2000 animals/day	No	5	Have accredited and in process
<b>Int 5</b>	Director of International Businesses	3	Between 800 and 2000 animal/day	Yes	2	In process
<b>Int 6</b>	Export Manager	2	Over 2000 animals/day	No	5	In process

Source: Elaborated by the authors

## 6.1.GENERAL PROFILE OF COMPANIES EXPORTING OR WANTING TO EXPORT TO CHINA

In Brazil, particularly in sectors where natural resources are dominant, larger firms are more involved in exportation than small and medium-sized companies (Fleury *et al.*, 2007). All the companies in the research can be regarded as either large or very large (Table 1 and Table 2), and most companies own more than one packer. About half of the companies have international joint ventures. This seems to be a high average for foreign direct investment (FDI), given that in Brazil FDI represents only 1% of the gross fixed capital formation, whereas the world average is 8.3% (United Nations Conference on Trade and Development, 2016). Foreign direct investment is also one of the most commonly adopted ways for US food-processing companies to enter foreign markets, where the companies acquire a maximum share of 10% in the external markets of business partners (Bolling and Somwaru, 2001). This is a particularly opportune means of overcoming trade barriers, obtaining first-hand information from the external market, and



possibly even producing at a lower price than in the firm's home country. Among the Brazilian beef packer companies that have international joint ventures, the average number of countries to which the company exports is 3.7, while among the companies that do not have joint ventures, the number is 2.6. Thus, internationalization via FDI seems to be the most efficient gate opener for the general internationalization of Brazilian beef packers, not only for one, but for diverse foreign markets. However, it is important to note that different slaughterhouses might have different levels of involvement with exports depending on the overall strategies of the national central headquarters.

## 6.2. INFORMATION SOURCE OF BRAZILIAN COMPANIES EXPORTING OR WANTING TO EXPORT TO CHINA

The research revealed that Brazilian companies have various means gathering information on the Chinese market, which is probably the case because of the absence of a clear and unified traceability system (Knoll *et al.*, 2017). Thus, stakeholders in the meat packaging sector need to be resourceful to obtain valuable and recent information on the Chinese markets, making it a crucial and competitive factor and not a unified supply chain strategy.

According to the questionnaire results, slaughterhouses receive most part of their information from traders, also called intermediaries. However, while such an information source may be the most up-to date; there is also a greater possibility of opportunism, especially when Brazilian slaughterhouses do not possess sufficient and trustworthy background information on the foreign market. This can be a problem, as reflected in the comments from Int.3, who states: *"We receive a lot of information from traders, in reality much more than we can process, and verify of its trustworthiness."* Int.4 adds, *"We receive a lot of requests via email from Chinese. We never know exactly who we are dealing with, but we take the risk"*. Thus, indeed it seems that trustworthy information from the information channels most used by Brazilian beef packing firms might not be fully reliable. However, information from such sources is taken into consideration, even when it presents a risk, due to the lack of information from other reliable sources, or the lack of investment to obtain it.

Information can be an expensive asset, thus a crucial decision taken by the firms is whether or not to acquire such information, and in general, how much will it cost and what kind of information is needed (Fu and Zhu, 2010). The present research shows the Brazilian beef packers

tend to invest in the acquiring of information. According to the survey results, the second largest source of information is private consultants. Interestingly, the result surged, although the biggest beef packing firms decided to leave this option blank. Thus, we assume that some companies, especially the larger ones, consider it a strategically relevant issue, and prefer not to answer such questions. Consequently, information on the Chinese market can be seen to be a competitive factor among the Brazilian beef packaging firms. This is in agreement with the findings reported by Thomé and Vieira (2012), stating that in the case of Brazilian beef packers knowledge on the Russian market, information flowing between the different firms is generally perceived as being against their interest.

The survey findings indicate the third most important source of information on the Chinese market are trade associations and governmental and state information communication. Int. 3 agrees with Int. 2 who states that *“We constantly receive information from the ABIEC and sometimes from the Agricultural Attaché”*. Since 2001, the ABIEC together with the National Export Promotion Agency (APEX) have undertaken an aggressive marketing plan to establish a common brand: *Brazilian Beef* on a global level (Steiger, 2006). Their goal is to improve horizontal partnerships in the processing and slaughtering sector of beef to decrease opportunistic behavior and increase the industry competitiveness regarding exports. However, one of the biggest challenges ABIEC faces is to prepare its members to develop supply chain sustainability through improved information sharing (Vieira and Traill, 2008). The Agricultural attaché’s responsibility on the other hand is more of a technical nature, and focuses on safety matters and plant accreditation processes. Thus, by being a member of ABIEC, the Brazilian packer firms receive reports focused on market movement and tendencies, whereas they receive more technical-related information from the Official Federal Government database. Although the questionnaire respondents and interviewees consider both information sources trustworthy, the information quality regarding volume and timeliness seems to be quite low.

Interviewees also mention the importance of the FDI regarding their acquisition of market knowledge. Int.6 states, *“I am open to capital investments from Chinese companies to get better access to information on Chinese demand, and I am also looking forward to investing in their brands or companies”*. The importance of investing in networking as a strategy (Kariv *et al.*, 2009) regarding information sourcing is also mentioned by Int. 5: *“I help Chinese from different areas to do business in Brazil. Then they help me in China...I also propose cooperative product*

*development to the Chinese.*” Thus, such collaboration between firms, either through direct investment or the exchange of favors can create an essential knowledge exchange mechanism between firms. Information sourcing of this kind is a managerial decision involving long-term planning and considerable resource investment that will probably pay off through the acquisition of unique first-hand information, which can ultimately provide unique opportunities.

Experience also proves to be a valuable tool for foreign market information sourcing (Reuber and Fischer, 1997), as mentioned by Int. 1.: “*We have precise information on details of the Chinese market, because we have one packer which is accredited to China and dedicates almost 100% of their production to the Chinese market.*” Barigozzi and Garlaschelli (2010) states that the information flow on a specific market (in our case China) becomes more specific and broader if the firm has a wider international network and experience in the market.

Thus, knowledge sharing processes can also be merged and used from inside the organization (Hakanson and Nobel, 2001; Becerra-Fernandez and Sabherwal, 2001). However, according to our findings, solid inside information seems to be the least frequent of source knowledge. This might be because the Chinese market still represents a new challenge for the Brazilian beef processors, thus only few firms (such as Int. 1.), have direct and inside experience with the Chinese market.

Last, but not least, according to the questioned firms, news and media sources seem to have the least impact when it comes to reliable information on the Chinese market. This might be related to the poor perception of the reliability/trustworthiness of the Brazilian media in general, but it might also indicate the need for the Brazilian media to adopt a more unified media channel regarding exports, which should be free of the influence from group interests and sensationalist approaches.

### 6.3. TESTING THE KNOWLEDGE OF BRAZILIAN BEEF PACKERS REGARDING THE CHINESE MARKET

The knowledge of the Brazilian packer firms was tested using a “knowledge test”. At the same time, the existence of a possible correlation between the test results, the firm's size and information sourcing was investigated. Multiple choice questions were used, usually containing five alternative answers from which the respondent was expected to mark only one. The answers

usually consisted of a mix of absurd answers, two very likely answers and an "I do not know" alternative.

Eleven questions were formulated to cover the most relevant information expected to be known by companies aiming to export to the Chinese market. Five international industry professionals aided the process of formulating and choosing the content of the questions. The questions were also highlighted by several authors when defining a company's competitiveness in a foreign market based on information. Eriksson *et al.*, (1997) highlight the importance of institutional knowledge on the market such as taxation, consumer channels and their particular features rules and laws, and business practices. Closs *et al.* (1997) and Moberg *et al.* (2002) emphasize the relevance of the accuracy and timeliness of knowledge. Berg's (2001) suggestion regarding the value of listening to the opinion of experts was followed, questions were included relating to Chinese general beef import volumes, the most desired product types at the moment of research and the ports most frequently used to enter the Mainland Chinese beef flow.

The responses are classified in the following spectrum of correct answers:

- 80-100% of correctly answered questions: really well informed firm
- 60-79% of correctly answered questions: well informed firm
- 40-59% of correctly answered questions: reasonably informed firm
- 20-39% of correctly answered questions: somewhat informed firm
- 0-19% of correctly answered questions: badly informed firm

These questions were only answered by the respondents of the online questionnaire. However, the results still represent the majority of Brazilian beef companies currently exporting or seeking to export to mainland China. Due to the possible usefulness of the information to managers and management scholars, while considering the unique nature of the study, it was decided to include these results in the analysis.

Overall, the highest rate of correct answers was 6 out of 11 (54.5% of the correct response rate), which correlates to a "reasonably informed" company on the Chinese market, reached by Quest 5. Interestingly, this score was obtained by a company that only owns one medium-sized packer, with only three different export destinations, and no foreign investment. Although the firm exports to Hong Kong, which could serve as a proxy for deeper knowledge of the Chinese market, its export share to Hong Kong is not outstanding. However, the major difference

between Quest 5 and the other companies is that the export department uses information on the Chinese market from all the sources listed, namely, solid inside information, governmental and state information communication channels, trade associations, traders, private consultants, colleagues/friends and the media. Thus, it can be said that in the specific case of the Chinese market, the knowledge held by Brazilian firms and the whole Brazilian slaughterhouse sector is so limited that no-one has or wants to share valuable market information. This suggests that almost any kind of knowledge on the Chinese beef market is given strategic value by Brazilian companies, which regard this information as an important asset to increase their competitiveness in the Chinese beef market. This point of view can be expected given the size of the Chinese market, its recent opening to Brazilian firms and the fast-changing market environment encountered in China.

No clear evidence was found of a correlation between foreign headquarters, number of export destinations and difference between firm sizes. However, it is interesting to note the companies that scored the highest in the knowledge test used the maximum or nearly the maximum number of information sources available to them, as with Quest 5. But, it should be noted that the firms that scored 5 points did not, in general, mention whether they obtained information through private consultancy, and 2 out of 3 did not state the amount of information they receive from governmental organizations. Due to the small number of responses in this category, it is not possible to determine the extent to which private consultancy and governmental information sources are of strategic importance to firms.

It is also interesting to note that, upon dividing the questionnaires according to processing capacity, the average number of correctly answered questions among the larger companies (slaughter capacity over 800 animals per day) is 38.2%, while among smaller companies, the average is only 21.6%. Although they seem somewhat distant from each other, this proportion cannot be considered statistically different at any reasonable significance level, due to the small sample size and consequent low power of a two sample test.

The number of joint ventures outside of Brazil does not seem to influence the company scores in Part C of the questionnaire. The average percentage of correctly answered questions among companies that do have international joint ventures is 28.8% against 27.3% for those that do not. The competences of firms tend to increase with the existence of a foreign headquarters, but may later stagnate if they fail to accompany developments in the foreign markets (Sull and

Escobari, 2004). This might be the situation in the case of Brazilian slaughterhouses. Thus, it might be inferred that while the foreign headquarters of company Nr.2 are reasonably well-informed regarding the latest events in the Chinese market, the processing and transfer of that information to the Brazilian headquarters, or perhaps the learning and knowledge transforming process in the Brazilian headquarters has weak points.

Similarly, the number of countries to which the company exports does not seem to affect the score: the average percentage of correctly answered questions among the companies that export to 4 or more different countries is 30.3%, while for those who export to less than 4 countries it is 26%. Again, experience with export destinations does not radically improve the knowledge levels of firms.

The question most often answered correctly was that regarding typical meat cuts sold in China, correctly answered by 69% of the respondents. According to specialists, shoulder steak, flank, bottom round are the beef cuts used for the hot pot, barbecue and the increasingly popular Korean dishes (Brown *et al.*, 2013). Surprisingly, the research team found no reliable public information on this question, thus it can be inferred this information is exchanged among business networks (Johanson and Vahlne, 2009) in China and Brazil.

The second question most frequently answered correctly was related to the Chinese regions with the current highest and greatest future potential for expanding consumption, correctly answered by 53.8% of the respondents. The correct answer is that all major cities in China have high rates of beef consumption and potential for growth. This information is widely available through APEX-Brazil and the major export associations (ABIEC, ABRAFRIGO) have access to this information and can forward it to their members (Frischtak *et al.*, 2015). Any urban hotspot is an attractive market for beef sales, especially those of imported beef, because, in general, the Chinese are more likely to trust food safety international regulations than their own production system and certification (Whitehead, 2014). Additionally, it is important to note that consumption in Northern China, especially those regions with a large Muslim population, also plays a relevant role.

Questions, related to the import quantity and import peaks, were both correctly answered by 5 companies. This fact has been reported in several sector specific media (for example BeefPoint 2016; Dinheiro Rural 2016; SistemaFaep 2015).

Questions related to bureaucracy, logistics and business culture also present low correct response rates (3, 3, 4), showing that few companies would be able to act efficiently without well informed traders. The questions related to import duties were correctly answered by only one company representative, although this information is publicly available at <http://tariffdata.wto.org/> and is fundamental when calculating revenues from a business transaction. Incompetence on the part of the firm's export department would seem to most plausible explanation for this result, which might reflect the high turnover of employees in Brazilian companies.

Information on marketing channels and the size of the premium market is only available to real Chinese market insiders and accordingly only one respondent correctly answered the related question. According to the main researcher's own experience, such information is only available to those with a firsthand experience of the market, or with an extremely well-established business network in a highly-trusted environment.

Surprisingly, none of the respondent seemed to know there is no long-standing tradition of cooking beef in China (except among the Muslim minorities), thus the Chinese rarely cook it at home and consequently the percentage of sales through supermarkets is small. Although this seems to be relatively well-published information (several Brazilian journals and organizations have highlighted the importance of the Chinese catering sector (BeefPoint, 2013; GloboRural, 2015; Bloomberg Brasil, 2016)). Thus, this seems to suggest that Brazilian firms do not trust the information available in their own media.

## **7. CONCLUDING REMARKS AND MANAGERIAL AND POLICY IMPLICATIONS**

The research results reveal that the interviewees, who are in leading positions in the headquarters of Brazilian beef packing companies or institutions operating in the export sector, have a low level of knowledge on the Chinese market. The findings show that neither firm size nor experience of beef exporting seem to influence the level of knowledge regarding the Chinese beef market. Similarly, no evidence was found to support the assumption that big multinationals have greater knowledge on the subject than smaller companies.

Regarding the possible sources of information and knowledge, the Brazilian beef export sector has neither a unified database containing essential information on the Chinese market, nor

a unified traceability system in place that could facilitate the flow of information among the agents across the beef trade supply chain (Knoll *et al.*, 2017). Thus, firms need to dedicate substantial management resources (time, financial, human) into collecting information and knowledge from several sources. Considering that information and knowledge about the Chinese market are a competitive factor, a fact firms seem to be well-aware of, firms that have the resources to invest in information gathering activities can get a competitive edge in the Chinese market. Unfortunately, although this situation might benefit individual companies with the resources to tackle the challenges related to information gathering, organizing and learning, it inhibits the successful promotion of *Brazilian Beef* as a brand on the Chinese market. Based on previous research conducted by our team (Knoll *et al.*, 2017), companies that have been successful in the emerging Chinese beef market are known to promote and exploit the countries of origin (Uruguayan Beef, Beef from New Zealand, Australian Beef) as one of their strong points in marketing communication strategies. For Chinese consumers, it is much easier to relate the quality of beef to the country of origin than to an unknown company or brand name. In countries such as Uruguay, New Zealand and Australia, farmers and packers recognized the importance of the geographic indication, and are now, together with government support and the private sector, positioning themselves accordingly. Additionally, the aforementioned countries transfer a lot of information on their products to the Chinese consumers (Ortega *et al.*, 2016), which makes their products even more preferred due to the consumer trust they have developed.

The research found that firms only partially penetrate the Chinese market, even with the supposed benefits of foreign direct investment, experience with exports or traders and third parties. Instead, crucial knowledge seems to be acquired from multiple sources, which according to Sull and Escobari (2004) is another means of obtaining the most valuable information on a foreign market. There might be several reasons for this. One of them is time (Johanson and Vahlne, 2009), since the Chinese beef market has only recently re-opened, factors such as experience and foreign investment have not yet paid off, and might need at least five years to do so (Hohenthal, 2006). Cultural differences in dealing with business networks might prolong that period. On the other hand, the mere fact of having the company headquarters located abroad does not ensure the Brazilian beef packer acquires quality and timely information, since, in order to do so, the team must do its job adequately. Because Brazilian beef is essentially a commodity product, with no specification for the Chinese market, Chinese buyers only pass on the



information that is absolutely necessary, such as quantity needed, price, and delivery time, without signaling any further information regarding the market tendencies.

When it comes to inside information about the Chinese market, the beef packers rarely develop their sources and scarcely consider such information. This might be because the beef packers do not have well-equipped specialists with trustworthy and valuable knowledge. Therefore, it can be assumed that even in the largest and leading export companies, the managers do not have the whole picture on this specific foreign market. Another explanation could be the high staff turnover in the Brazilian working force, which inhibits employees/specialists from focusing on consolidating their expertise on the Chinese beef market. This situation obliges companies to use specialist traders, special exporting channels, thus reducing the role of their export manager to manage the in-firm or out-firm deliveries.

The research results highlights the need for the Brazilian beef export sector to develop and implement information systems capable of ensuring the traceability of the beef from the farm to the Chinese consumer and that provide every segment within the supply chain with the framework to access at least the most basic information needed to ensure sustainable supply chain management (Buhr, 2003). Efficacy and efficiency in generating and relaying information across the supply chain is a big issue for the food system in emerging countries. Accordingly, more coordinated efforts on the part of the Brazilian Federal System of Quality Control (SIF) and the Brazilian Association of Beef Exporters (ABIEC) to homogenize and integrate information to a certain extent regarding the Chinese market and import requirements might be called for.

Depending on the cuts exported, Brazilian beef products to China are up to 50% cheaper than those supplied from Australia and Uruguay. Brazil is considered one of the cheapest geographical origins, while it has less direct access to mainland China. To add value and reach the middle-class Chinese consumer, a traceability system is recommended with the technological, institutional and informational infrastructure capable of producing and delivering weekly reports by the Brazilian and Chinese governments, export and import agents and sectorial associations to ensure and communicate food safety and supply and demand needs at a relatively low cost. Thus, our suggestion is a system in which the supply chain agents (both governmental and those private institutions already existing and active in the chain) and stakeholders should report, at least weekly, to an online database, to which every registered chain member would have access.

Such a database would contain at least the origin, production and processing capacity and storage capacity of the enterprises. It could signal demand and supply quantity and quality on weekly, monthly and half-yearly bases. By accessing such information and knowledge the supply chain member would know exactly who to contact and with which stakeholder to network. Such a platform could become a reliable traceability system based on agreements or contracts among the agents involved.

## **8. LIMITATIONS**

One of the research limitations is the low number of questionnaire respondents (13), although they represent a relatively high percentage of the total volume of beef exported from Brazil to China in 2016. To enrich the research, interviews were conducted with Brazilian and Chinese traders and export/import agents. The questions in part C of the questionnaire are related to basic knowledge of the Chinese market. However, it would be an exaggeration to claim that someone has a complete overview of the Chinese market because they correctly answered 11 questions. Hence, while the collected data offer some insights into the knowledge held by the Brazilian beef industry regarding the Chinese market, it is impossible to apply any statistical test to verify any hypothesis.

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## **CHAPTER VI. - DISTANCES AND THEIR IMPACT ON THE SINO-BRAZILIAN BEEF TRADE<sup>4</sup>**

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## 1. ABSTRACT

**Purpose:** The main objective of the study is to identify country-specific aspects affecting the beef trade between China and Brazil.

**Design/methodology/approach:** First, a matrix based on reliable secondary sources was established created upon indicators of economic, financial, policy, administrative, cultural, demographic, knowledge, global connectedness, and geographic distance between the two countries. This was combined with primary data from interviews conducted with two key stakeholders of the supply chain, namely the Brazilian agricultural attaché to China, and the director of Apex-Brasil. The results were analysed in a qualitative descriptive manner.

**Findings:** Cultural and political distances between Brazil and China are the most profound origins of challenges in negotiations on both the private and public level.

**Research limitations/implications:** The low number of interviews might be a limiting factor of the investigation. However, the interviewees' key position in the supply chain and data triangulation with secondary sources equilibrates the results' trustworthiness.

**Practical implications:** It is suggested that Brazilian governmental and private sector professionals are provided with cultural and political training on China before putting them on active duty.

**Originality:** Information collected and conclusions drawn from the research are unique in scientific and management literature related to this specific topic, and can be of great value for stakeholders, traders, and diplomats in the Sino-Brazilian trade.

**Keywords:** cultural distance, international food trade, China, Brazil, beef.

## 2. INTRODUCTION

China has one of the greatest beef herds in the world; however, it cannot saturate its growing domestic market due to inefficient structuration throughout the sector (Waldron *et al.*, 2010). At the same time, China is experiencing a dietary shift towards higher protein-based diets (Kearney, 2010; Rask and Rask, 2011; Zhai *et al.*, 2009). This has turned the Asian country into the fastest growing meat consumer in the world (Kearney, 2010) which had led to the opening of market potentials for foreign beef producing nations, such as Brazil (Ministry of Industry Foreign Trade and Services, 2014). However, the real potential to export beef cuts to China has not yet been explored, and trade volumes fluctuate greatly. Due to such reasons, Knoll *et al.* (2017) argue that the Sino-Brazilian beef supply chain has been conceived as an immature and unsustainable trade channel. The authors base their focus on the supply chain and its risk factors from an inside perspective. In order to round up this research, the aim is to approximate the topic from a macro and trade environmental point of view.

Thus, the intention of this investigation is to understand what the country-specific factors are, and how much they influence the beef trade between Brazil and mainland China.

Bearing in mind that the guiding question is about unveiling factors influencing trade, the concept of *distance* is introduced as a theoretical and methodological tool to advance towards a comprehensive working framework.

The subsequent section systematically illustrates how the concept of distance can be operationalised using the case of beef merchants between Brazil and China. The final section demonstrates the links found by the authors in order to answer the research question.

## 3. THEORETICAL FRAMEWORK

To understand trade tendencies between different countries and regions as a multidimensional, hence systematic approach, some authors suggest using distance as an explanatory mechanism (Berry *et al.*, 2010; Grant, 2005; Norrman, 2004; Ricart *et al.*, 2004). At the abstract level, distance refers to the differences between production and consumption decisions (Clapp, 2014). Under this view, distance is seen as a dual, but not static, relation that makes up the business environment. In global food chains, distance is understood as a multidimensional phenomenon comprising physical, cultural, social, economic, environmental,

and coordination features (Princen, 2002). From an institutional theory point of view, Jackson and Deeg (2008) and Pajunen (2008) argue that distance is an indicator for cross-national differences. Based on Whitley's (1992) theory, countries differ in terms of their business systems, specifically their economic, financial, and administrative practices.

Ghemawat (2001) takes a deeper look into factors such as distance in cultural, administrative, geographic and economic differences of trade. The coherence of such an approach was suggested by scholars such Berry *et al.* (2010) and Beugelsdijk *et al.* (2010) as one of the most comprehensive tools in understanding cross-nation differences. In accordance with Ghemawat (2001), but by widening and specifying the approach, Berry, Buillen and Zhou (2010) analyse distance in a descriptive way. The authors offer an easy to comprehend, systematic, nine-dimensional point of view, which is applicable not only for science, but also in management practices. Namely, they use economic, financial, policy, administrative, cultural, demographic, knowledge, global connectedness, and geographic distance as indicators to illustrate country differences in trade. Thus, guided by Berry *et al.* (2010), the different dimensions are defined as presented in Figure 1.

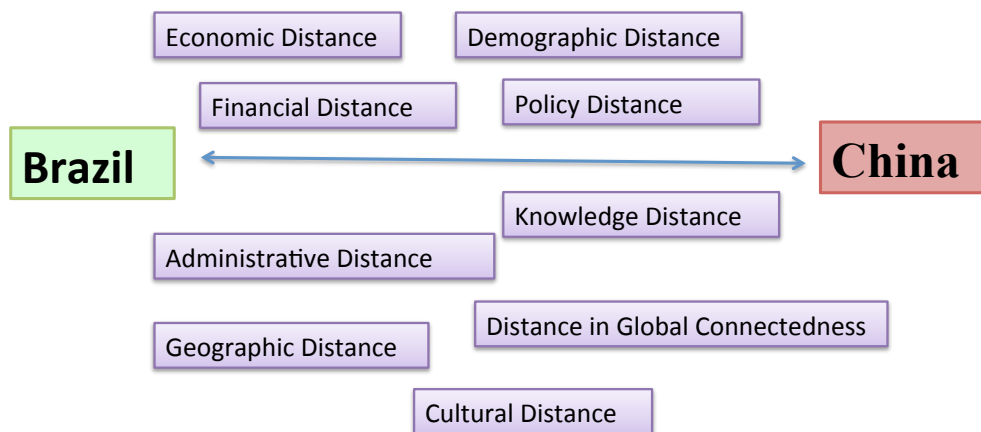


Figure 1: Trade-affecting factors on a macro level between China and Brazil

Source: Author's elaboration based on Berry *et al.*'s (2010) approach



*Economic distance* is the difference between the countries' economic developments and their characteristics (Caves, 1971; Whitley, 1992). Indicators of economic distance are relevant due to their power to demonstrate consumer purchasing power and preferences, macroeconomic stability, and their openness to receive and handle foreign effects inside the country (Campa and Guillén, 1999; Yeung, 1997).

*Financial distance* is closely related to economic factors, and with it defines the differences in the financial sector between each country (La Porta *et al.*, 1998 Whitley, 1992). The financial distance between two countries determines investment strategies and possibilities for both local and foreign partners. It also demonstrates a degree of financial visibility for investments (La Porta *et al.*, 1998). Therefore, it becomes a relevant instrument for market planning.

*Policy distance* is based on the concept of differences in the country's political environment, including its stability, democracy, trade bloc membership, etc. (Henisz, 2000; Henisz and Williamson, 1999; Whitley, 1992). The concept of political impact and political stability in a new foreign market becomes an important factor due to its potential to rapidly change administrative, financial and economical environments. Consequently, it converts into a key aspect for risk management and planning in terms of the managerial decisions of an internationalising enterprise.

*Administrative distance* shows the effect on trade relations via historical and political relations between countries (Ghemawat, 2001). Its analysis is based on country differences of colonial ties, local language and religion, and legal systems (Ghemawat, 2001; Henisz, 2000; La Porta *et al.*, 1998; Whitley, 1992).

*Cultural distance* is based on the varying attitudes toward authority, trust, individuality, importance of work, and family (Hofstede *et al.*, 2010; Whitley, 1992). It is a group of beliefs, values, and social norms that form the comportment of individuals and organisations (Hofstede *et al.*, 2010). Additionally, it is important to know that cultural and language differences affect the reasoning and logic of a person (Adler, 1991; Hofstede, 2001; Usunier, 1998). Therefore, differences in such areas impact gradually upon trade; although the development in technology and communication media might hinder it to a certain extent (Ganesan *et al.*, 2005).

*Demographic distance* is based on the dissimilarities in demographic characteristics between countries (Whitley, 1992). It can be based on indicators such as population size,

population growth, age structure, and others. Therefore, its impact can, in some cases, even define the attractiveness and market potential of a nation (Berry *et al.*, 2010).

*Distance in knowledge* is based on the countries' differences in patents and scientific production (Nelson and Rosenberg, 1993). As mentioned by Furman *et al.* (2002), knowledge building, creativity and innovation differ from country to country, and studies demonstrate the importance of these factors to multinational firms (Anand and Kogut, 1997; Berry *et al.*, 2010; Guler and Guillén, 2010; Nachum *et al.*, 2008).

The distance in *global connectedness* can be defined based on differences in a nation's attractiveness to tourists, and internet use (Guillén and Suárez, 2005; Nelson and Rosenberg, 1993). It shows how far and with how much efficiency a given country exchanges information with the world (Oxley and Yeung, 2001).

*Geographical distance* is measured based on the great circle distance between the geographic centre of the varying nations (Anderson, 1979). But in general, the farther two countries lie from each other, the less effective their knowledge transfer will be (Bhagat *et al.*, 2002). Thus, geographical distance has a greater impact on problem solving and project and strategy development. Also, firms located proximately tend to have lower transportation costs than those more distant from each other (Cannon and Homburg, 2001). Moreover, following the ideas of cluster theories, geographical proximity impacts the strength of relationship between the different parties and can undermine the possibility of developing greater mutual trust (Porter, 1998).

#### **4. METHODOLOGY**

In order to delve deeper into the research problem, an exploratory research approach was applied. Following Berry and his colleagues' (2010) suggestion, a secondary data collection was conducted before being transferred into a matrix and divided into nine main sections. As a second step, key players in the Sino-Brazilian beef supply chain were interviewed regarding their views on the importance of each section.

Berry *et al.* (2010) mention economic, financial, policy, administrative, cultural, demographic, knowledge, global connectedness and geographic distance between the home country and the foreign country as being crucial aspects for the evaluation of trade. As suggested

by the authors, indicators were used to describe the different distance categories based on secondary data freely available online. We used databases from the World Bank and the World Trade Organization (WTO) due to their rich, up-to-date and trustworthy data (Zaheer *et al.*, 2012). To determine the cultural dimensions between Brazil and China, the Hofstede Index was used as one of the most widely known numerically expressed indicators for cultural differences between countries and regions (Ghemawat, 2001). The Political Constraint Index was used on the suggestion of Berry (2015). It provides wide-ranging datasets with transparent methodology based on countries' indicators of local political tendencies and systems. Although the last update of this database was conducted in 2012, it is still considered valuable for research purposes based on its uniqueness and availability. The Freedom House and the CIA Factbook are data sources indicated by several authors as good fit alternatives in the case of analysis (Berry *et al.*, 2010; Ghemawat and Reiche, 2011). In addition, the beef packers plant data received from the Brazilian Ministry of Agriculture, Livestock, and Supply were included. We decided in favour of these data due to the importance of accreditation processes in the challenges faced by the Brazilian packers when exporting to China (Knoll *et al.*, 2017).

After an initial descriptive analysis of the collected data, it was decided that a purely quantitative investigation of the issue would not be appropriate. This was to ensure that crucial points of trade were not missed by sticking to numerical data study alone (Zaheer *et al.*, 2012). Furthermore, improved authenticity was desirable as well as case specificity of the analysis, for which secondary data were not sufficient. Accordingly, the acquired secondary data and the collected primary data were combined. Two interviews were conducted with key informants of the highest level key persons in the Brazilian diplomacy and business environment. Such data combination gave the investigation the opportunity to associate real life professional experiences with sound international indicators.

Due to several reasons mentioned below, the Brazilian agricultural attaché and the director of the Brazilian Trade and Investment Promotion Agency (Apex-Brasil) were considered as key informants in China.

The Brazilian agricultural attaché to China is a professional in a diplomatic position who is responsible for agriculture and agribusiness issues between the home country and the Peoples Republic of China. The attaché is positioned in the Brazilian embassy in Beijing, and responds to the Brazilian Ministry of Agriculture, Livestock, and Supply. She acts on issues such as

agricultural policies, trade outlooks, giving technical assistance for both countries to facilitate exchanges, etc. At the time of research, the attaché's main focus regarding the beef trade was on sanitary and technical issues including, amongst others, supervision of the Brazilian plants accreditation inquiry, negotiation on sanitary protocols between Brazil and China, and the preparation of home and foreign high level meetings.

Apex-Brasil is an organisation with both governmental and private ties. It has its centre in Brazil, and manages several offices all around the world. It operates as a consultant agency; it acts as promoter and information base for Brazilian products and services abroad, and performs as a promoter for foreign investment in Brazil. In China, the main objective of the agency is to endorse trade missions, and support Brazilian companies on trade fairs. Additionally, Apex-Brasil arranges opportunities for business-to-business meetings, and promotes Brazilian products as a whole. Regarding agricultural products, the agency supports the promotion of non-commodity, processed, or semi-processed Brazilian goods, including beef. In the beef sector, the agency cooperates with the Association of Brazilian Beef Packers (ABRAFRIGO).

The first interview was conducted with the Brazilian agriculture attaché for China on the 22<sup>nd</sup> March 2016 at the Brazilian Embassy in Beijing. The second interview was carried out with the director of Apex-Brasil China on the 13<sup>th</sup> April 2016 at the Apex-Brasil office in Beijing.

The interviews were planned based on the research objectives (Denzin and Lincoln, 2011), meaning in this specific case that the aim was to determine the most impacting country differences on the Sino-Brazilian beef trade. Consequently, the interviewees were asked several questions, focusing on the issue of:

- *What, in your opinion, are the biggest negative impacts on the Sino-Brazilian beef trade?*

The semi-structured interviews were open-ended, allowing interviewers to ask follow-up questions. The interviews had a duration of 30 minutes, and were conducted in Portuguese to give cultural and linguistic comfort to the interviewees. Both interviews were recorded and transcribed into the English language to facilitate the subsequent data analysis.

Due to the exploratory nature of the research, a positive approach (Silverman, 2006) was applied which was combined with a qualitative systematic content analysis conducted manually. This was to facilitate the interpretation of the primary data content, and to be able to draw

conclusions that might result in further hypotheses. The obtained data were categorised into the nine categories of distance mentioned by Berry *et al.* (2010), and thus made categories equal to the ones constructed previously for the secondary data.

Discussion of the results and validation of the data was carried out based on the similarities of the two independently-questioned informants' responses, and the secondary data acquired.

## 5. RESULTS AND DISCUSSION

Based on the suggestion by Berry *et al.* (2010), the beef trade between China and Brazil can be presented from a nine dimensional point of view: namely, from economic, financial, policy, administrative, cultural, demographic, knowledge, global connectedness and geographic distance perspectives. Although these nine dimensions are handled as part of a systematic overview on trade matters, the analysis split some dimensions from each other, for the simple reason that it enhanced the visibility and comprehension of each matter.

Table 1: Economic, financial, policy and administrative distance between Brazil and China

	<b>Dimension</b>	<b>Component variable</b>	<b>Source</b>	<b>Year</b>	<b>Brazil</b>	<b>Mainland China</b>
<b>Economic distance</b>	Income	GDP/capita (US\$)	The World Bank	2015	<b>8,538.60</b>	<b>7,924.70</b>
	Inflation	GDP deflator (%GDP)	The World Bank	2015	<b>8</b>	<b>-0.5</b>
	Exports	Export of goods and services (%GDP)	The World Bank	2015	<b>13</b>	<b>22.4</b>
	Imports	Imports of goods and services (%GDP)	The World Bank	2015	<b>14.3</b>	<b>18.8</b>
	Exchange volatility	Real effective exchange rate index (2010 = 100)	The World Bank	2015	<b>73.3</b>	<b>131.6</b>
<b>Financial distance</b>	Private Credit	Domestic credit to private sector (% GDP)	The World Bank	2015	<b>67.9</b>	<b>155.3</b>
	Stock market cap	Market capitalisation of listed companies (% GDP)	The World Bank	2015	<b>27.6</b>	<b>75.4</b>
	Listed companies	Number of listed companies	The World Bank	2015	<b>345</b>	<b>2,827</b>
<b>Policy distance</b>	Policy making uncertainty	Policy stability measured by considering independent institutional actors with veto power	Political Constraint Index Dataset (POLCON)	2012	<b>0.681289</b>	<b>0</b>

	Democratic character	Democracy score	Freedom House	2016	<b>Free</b>	<b>Not free</b>
	Size of the state	Government consumption (% GDP)	WDI	2015/2014 /2015	<b>20.2</b>	<b>13.6</b>
	WTO member	Membership in WTO (GATT before 1993)	WTO	2016	<b>Yes</b>	<b>Yes</b>
	Regional Trade agreement	Dynamic membership in the same trade bloc	WTO		<b>No</b>	<b>No</b>
	Tax on frozen beef (HS0202)	Taxes on Brazilian exports to the destination	WTO	2016		<b>16.3%</b>
<b>Administrative distance</b>	Coloniser-colonised link	What dyad shares a colonial tie	CIA Fact Book		<b>No</b>	<b>No</b>
	Common language	% population that speaks the same language in the dyad	CIA Fact Book		<b>Portuguese</b>	<b>Standard Chinese or Mandarin</b>
	Common religion	% population that shares the same religion in the dyad	CIA Fact Book		<b>Roman Catholic 64.6%</b>	<b>Unaffiliated 52.2%</b>
	Legal system	What dyad shares the same legal system	Law and Finance (La Porta <i>et al.</i> 1998)		<b>Based on French civil law tradition</b>	<b>Originates from German civil law system</b>
	Beef trade protocol	Number of slaughterhouses accredited to export to the location	MAPA	2016		<b>16</b>

Source: Author's elaboration based on a suggestion by Berry and his colleagues (2010)

It is clear from Table 1 that in economic terms, the main differences between Brazil and China lie in the strength and stability of their local currency. Brazil experiences frequent changes in exchange rates which, as is argued by some (Arestis *et al.*, 2016; Couto *et al.*, 2011), might even be a strategy of the Brazilian Development Bank to increase the position of its agricultural commodities in the international market. Nevertheless, such action increases the production price and risk of some meat sectors, such as the poultry industry. The reason for the industry's struggle is the high external input dependency (Costa, 2001). Its impact on the beef production price, however, is rather limited as a result of the pasture-based breeding environment of the Brazilian herd (McManus *et al.*, 2016). On the other hand, the Brazilian Reals volatility keeps the Brazilian beef prices low on the international market, and with it favours large-scale shipments to China.

As is also shown in Table 1, in the section of financial distance, China has a more active business environment than Brazil, demonstrated by its quantity of companies, their value, and credit activities. Based on ownership structure, family ownership (where families control more than 50% of the company stake) is the most relevant ownership type in the countries under the lens. Family-owned firms account for the majority of Brazilian enterprises (Lluch, 2014). This ownership type makes up nine out of ten firms contributing 50% to countries national GDP (Cambieri, 2012; Institute Family Firm, 2016). Family-owned firms are also the dominant ownership type in mainland China, where they represent 85% of the total company ownership (Institute Family Firm, 2016). Brazilian enterprises' outstanding share is limited and is mostly traded on the stock market. Latin American enterprises' waste usage of stock market is a sign of mistrust in the national banking systems, resulting from great governmental interventions and inflation rates in the 1990s (Sachs and Zini, 1996). Furthermore, there is limited access to bank credit, which comes with high interest rates, resulting in an unfavourable view of the banking system. In mainland China's case, the high ratio of family ownership comes hand-in-hand with a great outstanding share to GDP ratio. Yet, China's outstanding share is not based on the stock market, as is seen in Brazil's case. In China, outstanding stock implies high governmental interest. Foreign direct investment in the country is still in the low range (2.3% of GDP) (World Bank, 2017) and the governmental systems do not favour third party financial systems. Such high governmental power over enterprises creates a governing system, which becomes difficult to predict for outstanding parties and foreign traders.

When it comes to the issue of political influence on trade, Brazil, as expected, is more liberal than its trade collaborator. The strong governmental hand over the People's Republic of China leads to several consequences, examples of which have been stated by the Brazilian agricultural attaché located in Beijing. She states:

*“The length of slaughter plant and country accreditation handled by the Chinese governmental agencies pose challenges to Brazilian exports. The accreditation of an abattoir can take between 3-5 years or more, and regions ban lifting after a previous market closure can take several years (see the example of USA). Many aspects define the length of being on the “waiting list”. One of them is related to the particularity of the Chinese bureaucratic systems. In addition,*

*China has prioritised food safety following numerous animal protein scandals, which makes the approval processes of foreign countries and plants export to China a long-lasting process. In addition, the economic development in China and its opening up to international trade with several countries worldwide developed global interest. This is also relevant in the meat industry. As a result, it is important to consider that processing accreditation applications from different countries and its several slaughterhouses might create logistical challenges in the Chinese Governmental Offices, and delay accreditations in general.”*

As the director of Apex-Brasil for China states regarding this matter:

*“We need to see and understand that China indeed uses its right to accredit only certain plants from Brazil for their export to the mainland. China will never accredit all the Brazilian slaughter plants. China is accrediting in exchange of another agreement every time, which might not even necessarily be related to food products. So, the accreditation is an exchange.”*

Regarding this matter, the attaché states: *“We observe that China has a tendency to advance in negotiation with countries on certain issues much faster when there is a diplomatic visit delegation, or high-ranking leadership reunion scheduled”*. This means that diplomatic relations and their consistence and frequency seemingly have an additional effect on the speed of plant and countries’ approval for trade. This is also visible in the dimension of administration.

As shown, Brazil and China currently do not have any regional or bilateral trade agreements between each other, implying an applied tariff rate of frozen beef of between 12-25% (dependent on the specific cuts) (World Trade Organization, 2017) on entry to China. One of the main reasons for this is Brazil’s status in the trade bloc *Mercado Comum do Sul* (MERCOSUL), which has Argentina, Brazil, Paraguay and Uruguay as main members. One of the fundamental rules of MERCOSUL is that any members’ bilateral agreement with an external country of the trade bloc is also valid for every member inside it (Azzi da Silva and da Rocha, 2001). Thus, when Brazil comes to a bilateral trade agreement with China, by law, Argentina, Uruguay and Paraguay would get the same privileges as Brazil. Due to the similarities in production profiles



between the MERCOSUL members, this becomes uninteresting for China, who prefers to keep trade under more politically tactical terms. This also leads to the factors mentioned by the attaché, and impact every trade process between the countries, including the slowing down of beef packers' accreditation.

Nevertheless, it is important to keep in mind that the factors previously mentioned (economic, political, administrative, and financial distance) are the parameters between the countries that can change the fastest over time.

Whitley (1992) adds that countries' particularities based on economic, financial, and administrative practices do not only depend on its political system, but are also strongly impacted by demographic, geographic, and cultural backgrounds. Hence, a deeper look into these aspects is subsequently presented.

Table 2: The demographic and cultural distance between Brazil and China

	<b>Dimension</b>	<b>Component variable</b>	<b>Source</b>	<b>Year</b>	<b>Brazil</b>	<b>Mainland China</b>
<b>Cultural distance</b>	Power distance	WVS <sup>5</sup> questions on obedience and respect for authority	Hofstede Index	2010	<b>69</b>	<b>80</b>
	Uncertainty Avoidance	WVS questions on trusting people and job security	Hofstede Index	2010	<b>76</b>	<b>30</b>
	Individualism	WVS questions on independence and the role of government in providing for its citizens	Hofstede Index	2010	<b>38</b>	<b>20</b>
	Masculinity	WVS questions on the importance of family and work	Hofstede Index	2010	<b>49</b>	<b>66</b>
<b>Demographic distance</b>	Life expectancy	Life expectancy at birth, total (years)	The World Bank	2014	<b>74</b>	<b>76</b>
	Birth rate	Birth rate, crude (per 1000 people)	The World Bank	2014	<b>15</b>	<b>12</b>
	Population under 14	Population aged 0-14 (% of total)	The World Bank	2015	<b>23</b>	<b>17</b>
	Population above 65	Population aged 65 and above (% of total)	The World Bank	2014	<b>8</b>	<b>10</b>

Source: Author's elaboration based on a suggestion by Berry and his colleagues (2010)

<sup>5</sup> *World Values Survey*

One of the main challenges seems to arise from the cultural differences existing between the two countries. The attaché states: *“Language barriers and cultural differences account for the most significant impacts when it comes to affairs between our two countries”*. This influence goes beyond commercial reasons, leading to costly misunderstandings and higher transaction costs for both parties, as previously related by Isphording and Otten (2013). The attaché continues to state examples of cultural difference based on misunderstandings when it comes to the Brazilian Federal Inspection System:

*“When there is a visit from the Federal Inspection Services, it can happen that the host has 3-4 or more federal inspectors at his production site. Additionally, different visits will mostly have distinct officers, due to factors such as holidays, illness etc. Therefore, the rotation of inspectors visiting processing plants or the farms is high. Any of the around 600 federal inspectors have the right to inspect and sign official protocols and statements regarding the site visit. This is normal and is legal in Brazil. As a result, China receives several documents with different signatures from Brazil. That creates a permanent question: why is Brazil sending several different signatures from one port, and why they are changing all the time? There is a pronounced lack of understanding from the Chinese side on this matter. The Chinese authorities are working with excessive worries when they see different signatures every time, on the official documents. This originates from the fact that in China, the system works very differently. The Chinese system is extremely hierarchically organised, where only one person takes the responsibility for certain issues and topics, instead of several people responding to one issue”*. She continues: *“Chinese parties think that the Brazilian process is confusing and unreliable. On the Brazilian side, this issue of Chinese questioning the well-working inspection system creates frustration and irritation. It appears as an arrogance of Chinese authorities questioning the work and system of the Brazilian Agricultural Ministry, where Brazil is responsible for this issue and not China. This all leads to frustrations and delays on bureaucratic levels impacting every segment of the supply chain.”*

From the attaché's comment, Hofstede's assumption regarding uncertainty avoidance and power distance as issues of mutual understanding is given an example. The culturally routed misunderstanding between the countries' professionals in private and public areas are also relevant on the Brazilian side. As the director of Apex-Brasil to China states: "*At the moment there is really limited marketing here in China of the Brazilian beef products, because the Brazilians underestimate the power of the market and the needed marketing itself.*" This creates problems not only in consumer perception, but also at the business level. The attaché adds in this regard: "*Look at Australia; their production sector invests a lot in the Australian beef marketing in China. Everyone can work much better and easier with the brand name of Australian beef than with the Brazilian beef.*" Thus, Brazilians seem to miss out the creation of great business opportunities due to missing knowledge in the Chinese beef sector. One solution could be to improve visibility of Brazilian beef through online advertisements, restaurants and recognised supermarkets that promote and offer good quality beef with the geographic indication of its origin. In addition, online sales platforms should be considered. Such marketing channels already assist in the success of countries such as Uruguay, Argentina, and Canada.

From a demographic point of view, it is important to note that China is currently a society which is getting older. The one-child policy of the country had a great impact on this issue. Although the Chinese government realised the negative effect of an elderly society and tried to remedy this by introducing a new two-child policy in 2015 (Wang *et al.*, 2016), China will face the consequences of its low birth rate for many years to come. This, however, can also create business opportunities for exporting countries such as Brazil, if the market is accurately estimated and entered into via proper means.

Table 3: Distances in knowledge, global connectedness and geography between Brazil and China

	<b>Dimension</b>	<b>Component variable</b>	<b>Source</b>	<b>Year</b>	<b>Brazil</b>	<b>Mainland China</b>
Knowledge distance	Patents	Number of patents per one million population	USPTO/The World Bank	2015	<b>4.04</b>	<b>5.92</b>
	Scientific articles	Number of scientific articles per one million population	SJR/The World Bank	2015	<b>764</b>	<b>303.7</b>
Global connectedness distance	International tourism expenditure	International tourism, expenditures (% GDP)	The World Bank	2014/2013/2014	<b>1.69</b>	<b>1.74</b>
	International tourism receipts	International Tourism, receipts (% GDP)	The World Bank	2014	<b>0.42</b>	<b>0.6</b>
	Internet use	Internet users per 100 people	WDI	2015	<b>59.1</b>	<b>50.3</b>
Geographic distance	Great circle distance				<b>Santos - Port of Shanghai 13284 nm</b>	

Source: Author’s elaboration based on a suggestion by Berry and his colleagues (2010)

Regarding global connectedness through tourism, China shows greater figures than Brazil. This is related, amongst other factors, to the country’s number of cultural spots, with 50 sites registered as UNESCO World Heritage (The United Nations Organization for Education Science and Culture, 2017), its culinary attractions (Liu, 2016) and its diversity. In addition, China’s marketing regarding tourism, and its increasing media appearance due to economic growth, may encourage people to consider visiting the country more than Brazil. Although China’s internet users per 100 persons appears lower than in Brazil (see Table 3), it is important to note that the in terms of cities, economical centres, and trade hubs, connectivity is at a high international level. Nevertheless, information access is limited due to governmental censorship. Regarding the knowledge base, both countries have a low score in patents. In Brazil, this is mostly related to institutional complications within the patenting process (Santos *et al.*, 2014); yet, patenting in China has become much more commonplace in the recent years (He *et al.*, 2016).

Geographical distance between countries continues to have a great impact on trade relations (Ghemawat and Thomas, 2008). Although an excessive amount of literature argues that distance has become less important, as a result of technological innovation (Anderson and Van

Wincoop, 2004; Murphy and Hall, 1995) it is not entirely true in the case of water-based transportation (corresponding to 90% of shipments for all traded commodities around the globe [International Chamber of Shipping, 2014]). In fact, containerisation efficiency has improved water shipping, resulting in 15 times higher competence in dock handling. However, at the same time, rising port and fuel costs interfere with the calculations (Head and Mayer, 2013). Thus, due to the complexity of calculating total shipping costs, it is impossible to confirm whether costs related to water transportation have decreased. In the case of beef, the standard 34-day shipping time determines the sanitary and product requirements of the products; thus, only frozen beef can be transported due to its shelf life particularities (Knoll *et al.*, 2017). Nevertheless, none of the interviewees state that distance is necessarily a big challenge. It is taken more as a constant and calculated factor of trade.

To conclude, different country-specific factors have varying effects on the Chinese and Brazilian beef supply chain. These differences are illustrated in Figure 2, where the distinctive circle size indicates the importance of each and every factor on this specific trade flow.

## Most relevant external impacts on the Sino-Brazilian beef supply chain

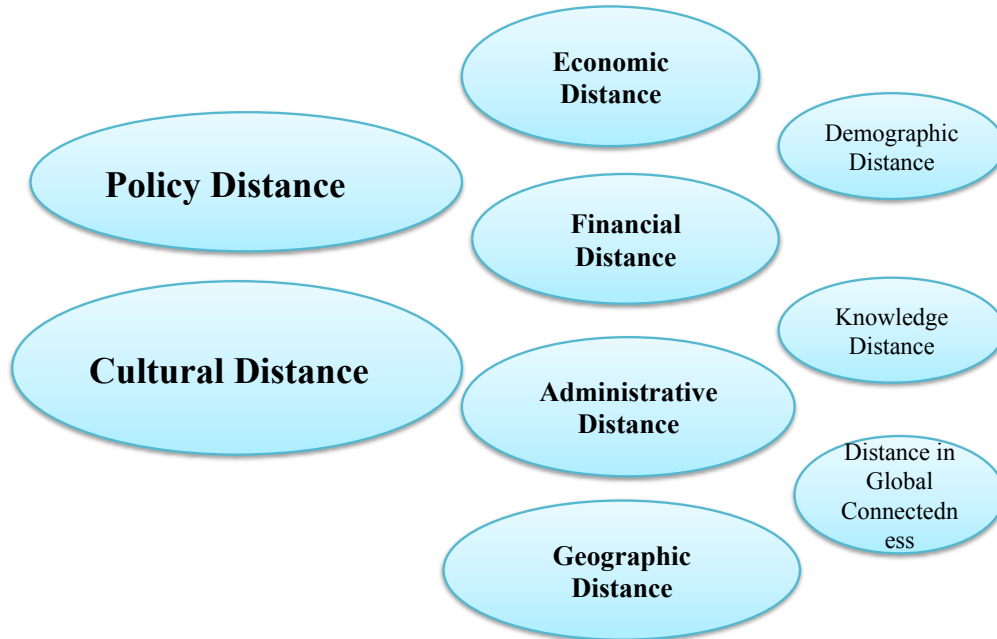


Figure 2: Different external factors impact on the Sino-Brazilian beef supply chain

Source: Author's elaboration

Due to the confrontation of secondary data with the interviewees' statements, cultural distance between Brazil and China appears to be one of the main factors complicating the beef trade. Although stakeholders are well aware of its existence, its effect on trade seems to be widely underestimated. Cultural distance also effects policy differences between the two countries' governing systems, which in the case of Brazil and China, has a substantial effect on handling trade-related issues, as shown by the primary data. Nevertheless, the authors believe that the effect of these two factors can be minimised through time, and may be the only such impacting factors due to the newly-developed trade flow of beef. As in all trade matters, geographical trade aspects play an impacting role not only on freight cost or delivery time, but also on understanding and problem management between different stakeholders of the supply chain. Nevertheless, this is considered as a constant and one of the most obvious challenges when entering the Chinese market from Brazil. During the research, administration, economy,

policies, finance, and knowledge distances were shown to be direct impacts of cultural and political factors, which will increase in the future, when the trade flow under discussion is considered more mature. To reduce such distances, more frequent information sharing between supply chain stakeholders and governments is considered a valuable option, combined with an increasing amount of mutual state visits of industry members, governmental representatives and officers. Therefore, cultural understanding and information exchange between both Brazil and China becomes one of the crucial pillars for improvement of trade sustainability and the future possibilities of the Sino-Brazilian beef trade.

## **6. CONCLUSION AND POLITICAL/MANAGERIAL IMPLICATIONS**

The research results reveal that cultural differences are the main cause of difficulties in the Sino-Brazilian beef trade process, followed by the dissimilarities in the countries' political systems. Although factors such as economic, financial, administrative, demographic, knowledge, global connectedness and geographic distances have an effect on trade, their impact in this early stage of the merchandise flow is less expressed, or they are direct consequences of the previously mentioned two distance variables.

In order to improve beef trade, it is suggested that Brazilian administrators living and operating in China are given a six- to twelve-month intensive preparation course on the foreign countries business, politics and culture before beginning their active duty abroad. This is a common practice for country representatives of the United States or Argentina to improve their professionals' negotiation and problem solving skills during their foreign mission. It is furthermore suggested that the countries' lead negotiators are not changed based on political or other fluctuations in their home country. Only constantly involved specialists are able to build up consistent, trustful and prosperous relations with Chinese officials. It is also proposed that a greater number of Brazilian representatives of agriculture should be installed in the Brazilian embassy in Beijing. One of Brazil's main export profiles to China is agricultural products. Accordingly, a delegation of at least 20 professionals dedicated to the Sino-Brazilian food trade on the spot would be adequate. It is furthermore recommended that certain specialists are exclusively dedicated to the issue of beef, on account of its tremendous relevance in trade volumes.

Due to the limited success of Brazilian and Chinese governmental-based negotiation, private sector investments get blurred information regarding the Chinese market. Thus, Brazilian companies take higher risks entering the Chinese market than other countries (such as Germany, Uruguay, Argentina, Australia, New Zealand etc.) This, of course, creates opportunities for Brazilian companies that manage risk well. However, the Brazilian beef sector as a whole does not benefit equally and sufficiently from its greatest external market. Thus, although associations such as ABRAFRIGO, Brazilian Beef Processors and Exporters Association (ABIEC) and Apex-Brasil exist to promote and assist exportation, a higher visibility of such organisations in the Chinese market is encouraged, together with an intensified marketing through the proper media channels. At present, Brazilian products are not as well respected on the Chinese market as its competitors (Argentina, Uruguay, Australia, etc.), mostly due to their lack of visibility to the Chinese market. This will change once the proper steps suggested on governmental and private levels are taken.

## **7. LIMITATIONS**

The main limitation of the research lies in the low number of interviews; however, the trustworthiness of the data was increased through the use of the distance matrices and further secondary literature and data.

## **8. ACKNOWLEDGEMENT**

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## **CHAPTER VII. –FINAL CONSIDERATIONS**

## **1. IMPLICATIONS FOR SCIENCE, POLICY AND MANAGEMENT**

In order to facilitate the visualization of the research results and their implications, a SWOT analysis was constructed based on the discoveries mentioned in Chapters III, IV, V and VI. Thus, special aspects of the Sino-Brazilian beef supply are categorised into a four-dimensional matrix of strength, weakness, opportunities and threats. The first two aspects combine results drawn from the investigation, and the last two aspects include additional results and interpreted implications of outcomes previously mentioned (see Table 1).



Table 1: SWOT analysis of Sino-Brazilian beef trade

<p><b><i>Strength</i></b></p> <ul style="list-style-type: none"> <li>• Brazilian scale beef production and supply</li> <li>• Brazilian natural beef, production environment</li> <li>• Brazilian beef non-additive policy</li> <li>• Favourable exchange rates of the Brazilian Real</li> <li>• Chinas beef import dependency</li> <li>• Fair international price paid by China</li> </ul>	<p><b><i>Weakness</i></b></p> <ul style="list-style-type: none"> <li>• Missing and unreliable or delayed information between the supply chain segments</li> <li>• Governmental relations between Brazil and China still immature</li> <li>• Brazil and Chinas cultural differences strongly impact private and public sectors</li> <li>• Brazilian beefs limited marketing investment in China</li> <li>• Limited adaptation to consumer requirements</li> <li>• Purely price oriented transactions</li> <li>• Low mutual trust of countries in each other's policies and regulations regarding food</li> <li>• Beef illicit trade through Hong Kong</li> <li>• Missing clear guidelines of standards</li> <li>• Weak traceability system regarding food safety and quality</li> </ul>
<p><b><i>Opportunities</i></b></p> <ul style="list-style-type: none"> <li>• Chinas challenge on self-sustainability with beef</li> <li>• Chinese consumers openness for new food trends</li> <li>• Existing general trust in imported beef</li> <li>• Branding</li> <li>• Online sales platforms merge</li> <li>• Brazilians beef image incorporation in supply demands of Chinese traders</li> <li>• Direct contact and supply between Brazilian export and Chinese restaurants and retail</li> <li>• US and India beef are not yet accredited for mainland China</li> <li>• Middle and premium markets both relevant</li> <li>• Genetic material export to improve Chinas beef cattle herd</li> <li>• Mutual visits of high ranking governmental officials</li> <li>• Online platforms for information exchange between stakeholders</li> </ul>	<p><b><i>Threats</i></b></p> <ul style="list-style-type: none"> <li>• Australian free trade agreement</li> <li>• Fragile and non-resilient supply chain</li> <li>• Radical changes in international diplomacy and national governmental decisions</li> <li>• Disease outbreak</li> <li>• Meat quality impact and bad marketing through weak product handling</li> </ul>

Source: The Author

Urbanization and growing prosperity in China goes hand in hand with diversification of food and taste. Aliments are being more and more seen as a lifestyle product, and their safety is demanded in increasing consumer circles. The domestic beef herd and the whole sector can at this moment not sustain this increasing demands.

The reasons for these current situations are the large fragmentation of the production, logistics, processing and even the retail industry, as well as rapid increases in production costs. They originate from the missing solid reproduction base, and miscalculations in the structuration of the processing industry. Hence, Chinese beef industry is unable to sustain the rapid consumption growth triggered by its young and middle-aged population with more financial resources. This, on the other hand, gives an opportunity for beef producing countries, such as Brazil. Conveniently, it also matches with the Brazilian governments commodity oriented export policy and the fluctuating value of the Brazilian Real. Brazilian beef could also have a larger market success due to the appreciation of foreign products by Chinese consumers. The Chinese population values imported beef due to its associated quality and safety. Additionally, a marketing strategy based on natural and hormone free growth are factors that can help to boost Brazilian beef sales in China. However, for such strategy to work; science, government, and the industry need to find a common ground. The task for science on this matter would for instance be to prove the quality and benefits coming from good practices in animal handling, raising, processing and trade. The governments tasks are to facilitate such research, promote it, and bring it closer to both the Chinese and the Brazilian industry. Finally, the industries task is to invest financial resources to facilitate the work of the previously mentioned institutions and processes. Among others, this need a stronger association of the breeding and processing industry -than we know until now-, to be able to act as one unified force in the Asian market, and not as single set of diversified brands.

Brazil, due to being a relatively new player to beef and food trade with China, faces several challenges in order to better understand the needs and wants of its new and biggest external market. In fact, administrative, political, economical, financial, ethnical and most importantly cultural differences challenge the sustainability of trade. One permanently appearing result of cultural distance is shown in the delays of issues related to handling both governmental and private levels. In this way, the information shared between the stakeholders of the two countries and main governing bodies is limited and delayed. As a consequence, transactions are almost

purely based on commercial pricewise relations between partners, without trust and clear guidelines. As discovered during the research, this phenomenon has multiple causes. One is the low number of persons involved in the Brazilian embassy in China with the specific issue of Sino-Brazilian food trade. Countries such as Argentina, Australia or the European Union members have specialist and diplomats specific for the food trade sector. In contrast, Brazil reaches a number of not even five professionals, representing each and every sector as a whole at the same time.

Thus, when it comes to negotiations between Brazil and China, the Brazilians are overwhelmed with information that is not properly handled, especially in relation to the smooth flow of knowledge and acute business vision. In addition, Brazilian governmental representatives positioned in China, only in the rarest cases have a preparation of cultural and policy differences before their actual admission to their position abroad. Accordingly, these specialists come to a foreign country, and from day-one are expected to deliver results out of an entirely unknown environment. Due to the extreme information quantity these professionals need to process from the first day in office, and the scarce assistance in that, they, even during their active time in the field in China, do not have too much opportunity to get to know the country and circumstances in which they operate. This is not the case with countries such as Germany or the United States of America, where the diplomats in similar positions are given months to make themselves at home, familiar, and comfortable with the new environment, and study it. Thus, it is recommended, that the Brazilian Ministry of Agriculture send a delegation to support the recent agricultural attaché in the embassy in China with specialist in different fields such as soy, beef, poultry, corn, sugar etc. It is also essential to provide them a special cultural and political training (maybe even language knowledge) while giving time of adaptation to their new living and working environment. These efforts would not only speed up country-to-country negotiations and project handling, but it would also give the Chinese governmental officials a clearer picture about Brazilian governing structure. Such steps would also facilitate the understating by Chinese officials and other industry members on Brazilian affairs, which could result in the decrease in time in which business-related matters are addressed and handled.

Further results of this research show that representation of the Brazilian beef industries is low. The association ABIEC is partially responsible for that. This is perhaps due to a lack of professionals in the area, missing resources, etc. ABRAFRIGO, the association of Brazilian

small and middle scaled beef processing sectors is active on the mainland. However, they have only one representative on the mainland, who could due to his firms own inters prioritize his company's growth over the association's common interest. Thus, both associations are in need to boost their investments (financial, human, time) regarding the Chinese market, if they want to achieve greater success. An other option could be the establish of new and more efficient association, with offices in mainland China and Brazil.

Lack of professionals on trade issues with Asian countries seems to be an issue in science, government and industry, all at the same time. Although professionals do not lack of knowledge regarding trade with European countries or the United States, a serious absence of well informed professional was discovered throughout the research on Asia related issues. That might be because the government and industry do not concede enough importance of its recent largest external beef market, and thus, do not encourage young professionals to engage in China related food trade careers. That can be interpreted as a pronounced misstep, since the recent and future possibilities China holds for Brazil are promising.

The estimated development of beef consumption in Chinese consumers creates several opportunities, and with it might be the right occasion to strengthen the brand *Brazilian Beef* together with its broader marketing context. Additionally, the unexplored sector of online sales can be a "golden mine", facilitating visibility, a lower number of intermediaries. Thus higher trust in the product and fasters net returns could be expected. Other marketing prospects -used often by countries such as Australia, Uruguay and New Zealand- include direct links with retail restaurants and hotels in China. They use the beef provenance as indication for high quality and value premiums in sophisticate menus. However, for these strategies to work it is imperative to have an enhanced working relation between the governments of Brazil and China. As it is explained alongside this thesis, the Chinese political environment has direct effects in trade and marketing outputs. Therefore, it is suggested that targeted more frequent high-level state visits; can generate positive results for the expansion of the Brazilian Beef brand.

Threats exist from inside and outside the supply chain. Risk factors from inside the chain result from weak traceability system in place. Not only that it hinders agile information flow between the segments, but it might also be the cause of a next epidemic outbreak in the Brazilian herd. Though, Brazil has proven to have a responsive disease control system during the past few years, it might end up in a repeated years long export ban from Chinas authorities if the next

animal health issue occurs. Regarding external risk factors, Australia and its free trade agreement with China might substantially impact the international beef trade relations, notably after 2018 when its implementation fully begins. Although Australia's production capacity is smaller than Brazil's, its exported quantity, quality and price might have substantial impacts on the Brazilian beef trade charts. Political changes in any strategic country can lead to readjustments on trade. One recent example of such is the Russian embargo on European food products following the Ukrainian crisis. Brazil swiftly and pronounced export peaks to Russia after the mentioned occurrence. It resulted in Brazil's rapid withdrawal from its recently opened Chinese market due to product reallocation. As a consequence to this, Chinese traders did not only rearrange their imports from other origins, they also lost substantial trust in a possible long-term trade relation with its biggest Latin-American partner.

Additionally, also impacted by political aspects, the recent United States political changes give Brazil a head start on governmental levels. It can be a fertile ground to expand further in its Asian trade partners market. It is a fact that Australia, Uruguay, Argentina, and New Zealand do not have the quantity to satisfy the Chinese appetite for beef. India, while able to deliver quantity, is not capable to deliver a constant quality under homogeneous food safety standards. Hence, Brazil has now a real and unique prospect to secure its biggest foreign market, only insofar when it is able to increase supply chain sustainability and resilience.

Thus, it is suggested to develop a voluntary based information platform, coordinated by the Chinese and Brazilian government, which unifies the most important information on the whole chain and its stakeholders (volume needed, availability, price, potential delivery time and supply-demand wants etc.), in order to improve trust, and with it sustainability along the whole chain. The author suggests that inspecting agents of the Brazilian Agricultural Ministry can be the leading protagonist in such system, since they are already present in every SIF approved slaughterhouse. They, for instance can upload the aforementioned data on a weekly basis in an electronic platform accessible only for certified supply chain members. It is suggested that a similar system could also be implemented on the Chinese side, of course, adapted to their own reality. Importantly, such a system should smoothly share reliable information, and thus, increase trust, visibility and cooperation between the supply chain stakeholders. Also, it should further be mentioned that transparency achieved by such system could potentially increase food safety and quality homogeneity. More importantly is perhaps the fact that the platform is a low investment

design of voluntary tractability, which can keep the Brazilian beef on a competitive economic value for the end consumer.

## **2. FINAL CONCLUSIONS**

Increasing cost of beef breeding, raising and processing, and food safety issues resulting from the sectors high fragmentation are few of the major problems the Chinese beef industry recently faces. Furthermore, consumers do not seem to trust in the countries own food quality and safety control system. Nevertheless, Chinese consider beef a healthy option of animal protein, and see it as a more secure food than other animal proteins. Additionally, they imply high social values to it. For such characteristics the Chinese upper income classes are willing to pay prices higher than the international market price. However, at the moment the Brazilian beef sector should rather focus on the expanding Chinese urban middle class. Young urban citizens are an increasing consumer base of beef products due to their growing diversification in food, their perceived food marketing and changes of social positioning in society. Important to consider for the beef sector is also the possibility to new strategically alliances throughout gradually stronger diplomatic ties between the countries. Thus, Brazil as big scale beef producer and exporter has a unique position to supply the Chinese beef market in a sustainable manner.

After analyzing the Chinese beef market and the opportunities it holds, research focus was switched to the investigation of the current Sino-Brazilian beef supply chains, and the pitfalls, which arose from it. Through mapping of the product flows, and the detailed description of each stage and transition point, main concerns were raised regarding the present traceability system in place. Resulting from such, scarcity and unreliability of information and coming missing confidence and trust in the partnering stakeholders seem to be the greatest reliabilities. Such issues do of course not prevent business transactions between the different stakeholders in the chain; however, they impact the business environment and its long-term perspectives. The purely transaction-based relationship between the members of the chain impedes harmonic business relations and lead to simple price-based operational transactions. Such shortcomings combined with the limited promotion of Brazilian beef in the Chinese market strongly effects the business and trade value of the product. The trade partners of the Brazilian beef industry do not know the

product and its attributes well. This result in limited willingness of purchase from the Asian end-costumer. Consequently, traders, in general, are negatively impacted and have a low commitment to the Brazilian beef. As a consequence, for a similar market price of the product Australian or Uruguayan beef is preferred over the Brazilian one. As seen from these two countries, marketing efforts can pay off, if well positioned and carefully applied. Due to their self-promotion Australia and Uruguay are currently able to buffer small changes in sales and production prices without breaking delivery contracts, and harming stakeholders.

In order to test the hypothesis made regarding information and knowledge lack in the supply chain, a Brazilian processing plant sector based research was designed. The Brazilian processors were considered the most directly impacted Latin American elements of the chain, in the case of eventual market tendency changes in China. Therefore, this segment was evaluated as adequate to measure the risk factors previously determined, related to information availability. Nevertheless, research limitations were present, due to the low number of processing companies entering the Chinese market. In order to overcome the limitations, and still get the widest responses regarding the research issue, questionnaire and interview results from a primary data collection were combined for a descriptive analysis. As a result, it was discovered that professionals in leading positions in the headquarters of Brazilian cattle meat packing enterprises have indeed limited knowledge on the Chinese beef market. However, no relation could be found between firm size and companies experience in exportation activities. Yet, the organizations that scored the best in our “knowledge test” used the most diverse information sources. These included traders, private consultancy, governmental and association sources, colleagues, friends, news, etc. The obtained research results indicate the missing existence of unified, up-to-data, and reliable information regarding the Chinese market. Hence, each and every company needs to invest a substantial amount of its resources in gathering and analyzing information, or, they need to be willing to face the threats of entering an unknown market environment. Accordingly, information concerning the Chinese market becomes a competitive factor between stakeholders in the supply chain. This situation, of course, benefits certain individual firms due to profit gains based on information resource availability; however, it goes against the successful promotion of the government and industry initiative of the nationwide brand called *Brazilian Beef*. Hence, it makes branding based on geographical indication during the recent structuration and organization of the Sino-Brazilian supply chain nearly impossible. This expropriates Brazil from

great chances, which countries such as Uruguay, Australia, New Zealand, Argentina, and Canada are already successfully taking advantage of, due to their higher amount of information flow between their supply chain stakeholders.

After the previous researches analyzed the Chinese beef sector, and the inside risk factors of the recent Sino-Brazilian beef supply chain, the last investigation of this thesis takes a macroeconomic (country) level approach on the trade flow under discussion. Results show, that impacts related to economic, financial, administrative, demographic, knowledge, global connectedness or geographic distances aspects are less relevant than the political and cultural differences between China and Brazil. These two aspects do not only influence private levels of product flow, but create communication gaps, and with it inhibitor of actions on administrative levels. Nevertheless, this might change with the wider greater experience of trade and negotiations. Therefore, an urgent need for professionals with a deep understanding of the beef market, as well as the cultural and political aspects of the two countries can be stated, in order to raise trade relations between China and Brazil to a new level.



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## ANNEX

## 1. QUESTIONÁRIO PARA MEMBROS DE ABIEC

- **Por que preencher esse questionário?**

Esta pesquisa avalia a assimetria de informação entre o mercado chinês e a produção da carne bovina brasileira. Baseado nessa informação, podemos planejar e construir uma plataforma eletrônica comum, que facilitará o rápido fluxo de informações relacionado à produção, processamento, consumo, e tendências da política e de mercado de setor bovino na China e no Brasil.

- **Qual o objetivo deste questionário?**

Este questionário tem com objetivo principal responder à pergunta: Quais informações os frigoríficos brasileiros possuem sobre o mercado chinês e como essas informações afetam as suas exportações, ou ainda as suas intenções de exportar, para a China?

- **Quem está respondendo esse questionário?**

As pessoas-alvo do questionário devem trabalhar em frigoríficos/ empresas processadoras de carnes e que estejam em cargos como gerente-geral, vice-gerente, gerente de produção, gerente de exportação, gerente de marketing, administrador ou similar.

- **Quanto tempo leva para responder o questionário?**

O questionário terá uma duração de maxio 10 minutos.

- **Quem coordena esta pesquisa?**

Esta pesquisa está sendo realizada por quatro instituições: UFRGS- NESPRO,UFRGS-CEPAN, Universidade de Agricultura de Nanjing, Instituto de Economia da Unicamp e conta com o apoio do Cepea/Esalq/USP e da ABIEC; A coordenadora desta pesquisa é Susanne Knoll (email:susanne.knoll@ufrgs.br , cel.: +86 158 9599 4102 (também whatsapp, wechat) , Skype: knoll.susanne

- **Minha privacidade esta garantida durante estas respostas?** Sim. Ao preencher o questionário, nenhum endereço eletrônico ou qualquer outra informação que possa identificar o respondente fica registrada. Assim, sua privacidade e anonimidade são garantidas.

*Este questionário contém duas partes principais, A e B. A parte A coleta informações relacionadas ao tamanho da empresa, perfil de exportação, atributos da informação e internacionalização. A parte B analisa o conhecimento relacionado ao mercado da carne chinês e seu ambiente.*

## PARTE A

**Gen\_prof. 1: Qual é a sua principal responsabilidade na sua empresa?** (Por favor, selecione uma opção)

- gerente/diretor geral
- vice-gerente
- gerente/diretor de produção
- gerente/diretor de exportação
- gerente/diretor de marketing
- administrador
- outros, por favor especifique \_\_\_\_\_

**Int\_invest 1. A sua empresa tem investimentos/sede/plantas processadoras ou em parceria fora do Brasil?**

- sim
- não

*Informação para montar o questionário online: Se a resposta à questão Int\_invest 1 for “sim”, por favor faz pular a questão para Int\_invest 2. Se a resposta for “não” faz o questionário pular para Gen\_prof 2.*

**Int\_invest 2. Em quais regiões sua empresa tem investimentos/sede/plantas processadoras ou parcerias fora do Brasil?** (Você pode assinalar mais de uma opção)

- América Latina
- América do Norte
- América Central
- Europa
- África
- Ásia
- Oceania

*Informação para montar o questionário online: Se a resposta à questão Int\_invest 2. for “Ásia”, por favor faz pular a questão para Int\_invest 3. Se a resposta for qualquer outra por favor faz pular para Gen\_prof 2.*

**Int\_invest 3. Sua empresa tem investimentos/sede/plantas processadoras ou parcerias na China?**

- sim
- não
- está em processo de estabelecimento
- nossa empresa planeja ter investimentos conjuntos na China no futuro

**Gen\_prof 2: Qual é a capacidade de abate (animal por dia) da planta onde você trabalha? Se, em mais de uma, por favor, assinale a maior delas. (Por favor, selecione apenas uma resposta)**

- Menos de 500 animais
- Entre 500 e 800 animais
- Entre 800 e 2000 animais
- Mais que 2000 animais

**Gen\_prof 3: Quantas plantas sua empresa possui no Brasil?**

- Apenas uma
- Duas plantas
- Três plantas
- Quatro plantas
- Cinco plantas ou mais?

**Int\_Profile 1. Do total produzido pela sua empresa, qual é o percentual destinado à exportação?**

- entre 0
- entre 1-20%
- entre 21-40%
- entre 41-60%
- entre 61-80%
- entre 81-100%

**Int\_Profile 2. Quais mercados não brasileiros seus produtos atendem? (Por favor, assinale os destinos e a participações do volume exportado para cada um em relação ao total)**

<b>Destino/ Percentual do total exportado</b>	<b>Percentual das exportações totais entre 1%-20%</b>	<b>Percentual das exportações totais entre 21%-40%</b>	<b>Percentual das exportações totais entre 41%-60%</b>	<b>Percentual das exportações totais entre 61%-80%</b>	<b>Percentual das exportações totais entre 81%-100%</b>
Hong Kong					
Egito					



Russia					
Venezuela					
Irã					
Chile					
China					
União Européia					
EUA					
Outros					

## PARTE B

**Accred\_Ch 1. A sua empresa é habilitada para exportar produtos congelados de origem bovina para a China?**

- sim
- não
- não, mas estamos em processo de habilitação

**Inf\_atr 1. Onde/com quem a sua empresa obtém as informações relacionadas ao mercado de carne chinês?**

<b>Nome/percentual de informação recebida sobre a China</b>	<b>0%</b>	<b>1-30%</b>	<b>31-60%</b>	<b>61-80%</b>	<b>81-100%</b>
Informações dentro da empresa					
Governo – informações estatais					
Sindicatos - Associações					
Traders					
Consultorias privadas					

## PARTE C – com respostas corretas

**Know\_Ch 1: Dos cortes de carne, quais são os mais populares e comuns no mercado chinês?**  
(Por favor, selecione apenas UMA resposta)

- Miolo de paleta, Fraldinha, Coxão mole, Peito/Paleta
- Picanha, File Mignon, Fraldinha
- Lombo, Costela, Fraldinha
- Eu não sei

*Resposta correta: Miolo de paleta, Fraldinha, Coxão mole, Peito/Paleta*

*Referencia: Knoll, S., C.S.S. Marques, J. Liu, F. Zhong, A.D. Padula, and J.O.J. Barcellos. 2017. "The Sino-Brazilian Beef Supply Chain: Mapping and Risk Detection." British Food Journal 119 (1): 164–80. doi:10.1108/BFJ-07-2016-0346.*

**Know\_Ch 2: Quais são os documentos necessários para a exportação de carne congelada para a China?** (Por favor, selecione apenas UMA resposta)

- Lista de embalagem, Certificado sanitário da exportação, Certificado de Origem, Declaração que a embalagem não contém material de madeira e Conhecimento marítimo/conhecimento de embarque.
- Certificado de origem em Chinês; Documento de habilitação da planta; Certificado de HACCP; Certificado de IVA
- Documentação de habilitação da planta; plano de embarque; Certificado do SISBOV, Certificado de origem animal
- Certificado de origem em Português; Certificado SIF, Certificado de Inspeção pelo CIQ
- Eu não sei

*Resposta correta: Lista de embalagem, Certificado sanitário da exportação, Certificado de Origem, Declaração que a embalagem não contém material de madeira e Conhecimento marítimo/conhecimento de embarque.*

*Referencia: Comunicada responsável importadora do COFCO. COFCO é o processador e importador de alimentos mais grande da China, sendo em mãos do governo.*

**Know\_Ch 3: Qual é tarifa de exportação da carne brasileira para a China? (não inclui Hong Kong)** (Por favor, selecione apenas UMA resposta)

- 0%
- Entre 1-10%
- Entre 11-20%
- Entre 21-30%
- Eu não sei

*Resposta correta: Entre 11-20%.*

*Referencia <http://tariffdata.wto.org/>*

**Know\_Ch 4: Quais as principais formas de divulgação/propaganda de carne bovina na China?** (Por favor, selecione apenas UMA resposta)

- Email/journal
- Aplicativos de celular / comerciais na internet / TV
- Tv, jornais e rádio
- Eu não sei

*Resposta correta: Aplicativos de celular/ Comerciais na internet/ TV.*

*Referencia China International Meat Conference 2015. 17.11.2015 Beijing*

**Know\_Ch 5: Onde os chineses compram carne bovina** (Por favor, selecione apenas UMA resposta)

- Maior parte pela internet/online
- Maior parte em restaurantes/hotéis
- Maior parte em supermercados
- Maior parte em mercados tradicionais/feiras
- Eu não sei

*Resposta correta: Maior parte em restaurantes/Hotéis*

*Referencia: Waldron, S., (2010), "Modernizing traditional agriculture in China through the development of higher value agri-food chains, PhD Thesis, Queensland University, Queensland*

**Know\_Ch 6: Qual a participação dos cortes de primeira/de qualidade no mercado chinês?** (Por favor, selecione apenas UMA resposta)

- Aproximadamente 2%
- Aproximadamente 5%
- Entre 10-15%
- Até 20%
- Eu não sei

*Resposta correta: Aproximadamente 5%*

*Referencia: Waldron, S., C. Brown, and J. Longworth. 2010. "A Critique of High Value Supply Chains as a Means of Modernising Agriculture in China: The Case of the Beef Industry." Food Policy 35 (5). Elsevier Ltd: 479–87. doi:10.1016/j.foodpol.2010.05.005.*

**Know\_Ch 7: Qual o volume importado esperado para 2016 na China?** (Por favor, selecione apenas UMA resposta)

- Entre 70.000 e 100.000 Toneladas
- Entre 100.000 e 300.000 Toneladas
- Entre 700.000 e 1.000.000 Toneladas
- Entre 1.000.000 e 1.200.000 Toneladas

*Resposta correta: Entre 700.000 e 1.000.000 Toneladas*

*Referencia: USDA database, and International Meat Conference 2015 in Beijing.*

**Know\_Ch 8: Existe algum festival ou época de ano na China onde possa ocorrer um pico de consumo de carne bovina?** (Por favor, selecione apenas UMA resposta)

- Não, o consumo de carne chinês é estável
- Sim, no Natal
- Sim, nos festivais de primavera
- Sim, geralmente durante o período mais frio do ano
- Eu não sei

*Resposta correta: Sim, nos festivais de primavera que e também a época mais fria do ano*

*Referencia: Joel Haggard diretor do USMEF na Ásia comunicado via e-mail 2015.12.12.*

**Know\_Ch 9: Quais partes da China tem o maior potencial de consumo de carne bovina?** (Por favor, selecione apenas UMA resposta)

- Hong Kong
- Pequim
- Shanghai
- Todas as grandes cidades
- Eu não sei

*Resposta correta: Todas as grandes cidades.*

*Referencia: Frischtak, C., Soares, A., Cariello, T., Flores Orth, C., Santos, C. Steffen, P.: (2015) Oportunidades de comércio e investimento na china para setores selecionados pp. 1-80*

**Know\_Ch 10: Por quais portos na China Continental chegam as carnes brasileiras? (Por favor, selecione apenas UMA resposta)**

- Shanghai and Beijing
- Hong Kong
- Nanjing e Guangzhou
- Pelos maiores portos, incluindo Shanghai, Beijing, Nanjing, Guangzhou etc.
- Eu não sei

*Resposta correta: Pelos maiores portos, incluindo Shanghai, Beijing, Nanjing, Guangzhou etc.*

*Referencia: comunicado do ABIEC no 09.09.2015 via e-mail.*

**Know\_Ch 11: Cultura chinesa de negócios/comércio é baseada em.... (Por favor, selecione apenas UMA resposta)**

- Metas de curto prazo, confiança limitada, envolvimento pessoal limitado
- Amizade e relação estabelecida anteriormente ao fechamento do negócio, alto envolvimento pessoal e negócio de longo prazo.
- Amizade e relação pessoal é necessária antes do fechamento do negócio, negócios de curto prazo
- Puramente negócio, sem construção de relacionamento pessoal
- Eu não sei

*Resposta correta: Amizade e relação estabelecida anteriormente ao fechamento do negócio, alto envolvimento pessoal e negócio de longo prazo.*

*Referencia: Dunfee, T. W., & Warren, D. E. (2001). Is guanxi ethical? A normative analysis of doing business in China. Journal of business ethics, 32(3), 191-204.*

Agradecemos o tempo disponibilizado para responder este questionário. As suas respostas ajudarão a melhorar a rede de informações sobre carne bovina entre o Brasil e a China. Para mais perguntas relacionadas à pesquisa, ou ainda sobre assuntos relacionados ao mercado chinês, por favor, entrar em contato com a coordenadora desta pesquisa Susanne Knoll, email: [susanne.knoll@ufrgs.br](mailto:susanne.knoll@ufrgs.br) , Skype: knoll.susanne ou celular: +86 158 9599 4102 ( wechat & whatsapp)

## 2. BRAZILIAN BEEF PACKERS EXPORTED IN CHINAS INTERNATIONAL INVESTMENT PROFILE (QUESTIONNAIRE PART A)

Table 1: Brazilian beef packers exported in Chinas international investment profile (questionnaire part A)

Codes	Int_invest 1	Int_invest 2.		Int_invest 2.	Int_invest 2.	Int_invest 2.	Int_invest 3.
Quest 1	No						
Quest 2	No						
Quest 3	No						
Quest 4	Yes	Latin America					
Quest 5	No						
Quest 6	Yes	Latin America					
Quest 7	No						
Quest 8	No						
Quest 9	Yes	Latin America					
Quest 10	No						
Quest 11	Yes	Latin America		North-America	Europe	Asia	-
Quest 12	Yes					Asia	Under establishment
Quest 13	Yes	Latin America					

Source: Authors elaboration based on the questionnaire results

### 3. BRAZILIAN BEEF PACKERS INTERNATIONAL EXPERIENCE BASED ON EXPORT INVOLVEMENT (QUESTIONNAIRE PART A)

Table 2: Brazilian beef packers' international experience based on export involvement (questionnaire part A)

Codes	Int_Pro. 1.	Int_Prof 2.								
		Hong Kong	Egypt	Russia	Venezuela	Iran	Chile	China	EU	Others
Quest 1	1-20%	61%-80%	41%-60%		21%-40%					21%-40%
Quest 2	0%									
Quest 3	0%									
Quest 4	61-80%	81%-100%	81%-100%		81%-100%	81%-100%	81%-100%			81%-100%
Quest 5	21-40%	21%-40%	1%-20%	21%-40%						
Quest 6	1-20%	81%-100%								1%-20%
Quest 7	1-20%	61%-80%								1%-20%
Quest 8	21-40%	21%-40%	1%-20%	21%-40%					1%-20%	21%-40%
Quest 9	61-80%	1%-20%			21%-40%		21%-40%			
Quest 10	21-40%	41%-60%				21%-40%	1%-20%			Emirates, Singapore
Quest 11	41-60%		21%-40%				1-20%	21-40%	1%-20%	10%
Quest 12	21-40%	81%-100%								
Quest 13	0%	1%-20%	21%-40%	41%-60%			61%-80%	81%-100%		

Source: Authors elaboration based on the questionnaire results

#### 4. ACCREDITATION STATUS AND INFORMATION SOURCE OF BRAZILIAN BEEF PACKERS (QUESTIONNAIRE PART B)

Table 3: Accreditation status and Information source of Brazilian beef packers (Questionnaire part B)

Codes	Accred_C h 1.	Inf_atr 1							
		Firm inside information	Governmental and State information communications	Syndicates and Associations	Traders	Private consultancies	Colleges/friends	News	Others (Specify)
Quest 1	In process	-	61-80%	31-60%	-	31-60%	1-30%	0%	-
Quest 2	Yes	31-60%	1-30%	0%	0%	1-30%	0%	61-81%	-
Quest 3	No	-	-	-	-	-	-	61-81%	-
Quest 4	In process	81-100%	81-100%	-	81-100%	-	-	0%	-
Quest 5	In process	1-30%	1-30%	1-30%	1-30%	1-30%	1-30%	1-30%	-
Quest 6	In process	0%	0%	0%	81-100%	0%	81-100%	0%	-
Quest 7	In process	-	-	1-30%	1-30%	-	1-30%	1-30%	-
Quest 8	In process	-	-	1-30%	1-30%	-	-	0%	-
Quest 9	In process	0%	1-30%	31-60%	61-80%	31-60%	1-30%	1-30%	-
Quest 10	In process	0%	-	1-30%	1-30%	0%	0%	1-30%	Market, Expositions, research
Quest 11	Yes	-	-	61-80%	-	-	0%	0%	-
Quest 12	In process	0%	0%	61-80%	1-30%	81-100%	0%	1-30%	-
Quest	No	0%	1-30%	-	31-	-	1-30%	1-	-



13					60%				30%	
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Source: Authors elaboration based on the questionnaire results

## 5. BRAZILIAN BEEF PACKERS KNOWLEDGE ON THE CHINESE MARKET (WRIGHT AND WRONG ANSWERS) (QUESTIONNAIRE PART C)

Table 4: Brazilian beef packers knowledge on the Chinese market (wright and wrong answers) (Questionnaire part C)

Question codes	Know_Ch 1.	Know_Ch 2.	Know_Ch 3.	Know_Ch 4.	Know_Ch 5.	Know_Ch 6.	Know_Ch 7.	Know_Ch 8	Know_Ch 9.	Know_Ch 10.	Know_Ch 11.	N. Correct
Question 1	+	-	-	-	-	-	+	-	-	-	-	2
Question 2	-	-	-	-	-	-	+	-	-	-	-	1
Question 3	-	-	-	-	-	-	+	-	-	-	-	1
Question 4	+	-	-	-	-	-	+	-	+	-	-	3
Question 5	+	+	-	+	-	-	-	+	+	-	+	6
Question 6	+	-	-	-	-	-	-	+	-	+	-	3
Question 7	+	-	-	-	-	-	+	+	+	-	+	5
Question 8	+	-	-	-	-	-	-	+	+	+	+	5
Question 9	-	-	-	-	-	-	-	-	-	-	-	0
Question 10	+	-	-	-	-	-	-	-	-	-	-	1
Question 11	+	+	-	-	-	-	-	-	+	+	-	4
Question 12	+	-	-	-	-	-	-	+	+	-	+	4
Question 13	-	+	+	-	-	+	+	-	+	-	-	5
N. correct	9	3	1	1	0	1	5	5	7	3	4	

Source: Authors elaboration based on the questionnaire results